Interactive Qualifying Project

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PERFORMANCE EVALUATION SOLUTIONS: IMPROVING SERVICE QUALITY AT A TELEPHONE SOLICITATION SERVICE

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This report is the product of an education program, and is intended to serve as partial documentation for the evaluation of academic achievement. The report should not be construed as a working document by the reader.

3 de julio de 2000

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Sra. Arana Puente:

Adjunto con nuestra carta encontrará nuestro reporte titulado *Performance Evaluation Solutions: Mejorando la Calidad de Un Servicio de Solicitación de Teléfonos*. Este informe fue escrito para el Servicio de Información 113 durante el período del 13 de mayo hasta el 3 de julio de 2000. El trabajo preliminar fue completado en Worcester, Massachusetts, previo a nuestra llegada a Costa Rica. Copias de este reporte han sido sometidas simultáneamente a los profesores Ángel Rivera y Roberto Pietroforte para evaluación. Después de revisado por el cuerpo docente, la copia original de este reporte será catalogada en Gordon Library en Worcester Polytechnic Institute. Apreciamos el tiempo y ayuda dedicadas por Ud. y por el apoyo de todos en el Servicio de Información 113.

Atentamente,

Michael Cuipa Kevin M. Keenaghan Paula P. Russomanno

ABSTRACT

Information Service 113 is concerned with the quality of service it provides to its customers. Ing. Katia Arana Puente, Director of Information Service 113, commissioned our group to evaluate and criticize the Service's recent performance. Our research resulted in a system of rating for the Service and its operators, as well as a system for the replication of these results. Along with the new system of evaluation and recommendations developed in the project, the effectiveness of the Service's evaluation procedures was improved without sacrificing the quality of service currently provided.

AUTHORSHIP PAGE

The results of this project reflect an equal distribution of labor between the members of this IQP group: Michael Cuipa, Kevin Keenaghan, and Paula Russomanno. Each member of the group contributed their thoughts, ideas, and efforts to each aspect of the project. The three major areas of the project (the rating systems, the program of evaluation, and the general writing of this report) were led by Paula, Michael, and Kevin, respectively; however, the final product reflects an equal amount of work by each member of the team.

ACKNOWLEDGEMENTS

There are a number of people to whom we owe many thanks for their assistance and support with this project. First and foremost we must thank our advisors, Professors Angel Rivera and Roberto Pietroforte, without whom we would still be struggling with the goal of this project.

We would also like to thank Katia Arana Puente and Leda López Venegas, as well as the rest of the Information Service 113 staff for all of the information that they provided.

In addition, we would like to thank Karen Burke and Professors Joe Zhu, Ingrid Vargas, Susan Vernon-Gerstenfeld, and Arthur Gerstenfeld for taking the time to provide us with help in the research for this project.

We owe an immense debt of gratitude to Jon Magnussen for his technical assistance with Active Server Pages, and to Katie Wheeler and Estéban in los Apartamentos Tairona for their assistance in proofreading our Spanish translations in this report.

Finally, we would like to thank Microsoft Word for destroying the file containing this document, giving us countless hours of enjoyment as we frantically rewrote two weeks worth of corrections to this report, the day before it was due.

EXECUTIVE SUMMARY

Information Service 113 is a telephone number solicitation service provided by the Costa Rican Institute of Electricity [ICE]. Clients of the Service (the general Costa Rican public) can call the Service and request residential, commercial, governmental, and public telephone numbers. The calls are received at the Service by the 150 operators currently working there. The operators work in fifteen alternating shifts, and receive approximately 2.6 million calls each month. The operators' performances are evaluated weekly by the Quality Control Department of the Service.

At the initiation of this project, the Service faced a number of issues: its system of evaluation was inadequate, the operators were dissatisfied with a number of aspects of the Service, and the Service wanted to develop a rating system for its performance and for the performance of its operators. Because of the pending issue of privatization of ICE, Information Service 113 was concerned with the quality of service it was providing to its clients. For these reasons, Ing. Katia Arana Puente, Director of the Service, commissioned the project team to assist with the issues listed above.

Throughout the project, the IQP team had one main goal: to improve the system of evaluation of the Service without sacrificing the quality of service provided to its clients. To this end, the students developed three main objectives. The first two objectives were to create a system of rating for the overall Service, and to create a similar system to rate the performance of its operators. For each of these two objectives, a secondary objective was to create a method to replicate the rating systems in the future.

The third objective of the project was to create an improved and automated system of evaluation for the supervisors of the Service.

The project team developed a system of rating for the operators of the Service based on the number of calls correctly answered (without errors). The system produced a Bell-Curve distribution of the operators, with only six operators performing at a "poor" level, and 22 operators performing at an "excellent" level. The average operator was performing between "good" and "acceptable" levels. The results of the system were placed into a Microsoft Excel worksheet (presented electronically to the Service along with this written report), which can be modified or reused for future ratings. In addition, a manual was created and presented to the Service, which explains the use and modification of the system.

The team also developed a system of rating for the Service, based on a similar formula as the operator rating system. This system provided monthly ratings of the Service, as well as an average yearly rating. For 1999 and the first half of 2000, the Service was performing on average at an "acceptable" level. These results were also placed in a Microsoft Excel worksheet, which allows the Service to view the monthly performances of a particular year, or a comparison between individual months or years. As with the previous objective, a manual was created and presented to the Service, which explains the use and modification of the system.

In order to improve the current system of evaluation of operators, the team developed an intranet-based web page program for evaluations. This system will replace the current manual system of evaluation and report creation. The program is linked to a Microsoft Access database, which automatically creates error and evaluation reports. As

with the first two objectives, a manual was created and presented to the Service, which describes the use and modification of the program and database. The program is currently completed, but requires installation onto the Service's intranet server before a link between the program and database can be established. The project team lacked enough understanding of intranet servers to do this; however, it can be accomplished quickly and easily by someone with adequate knowledge of servers.

Finally, the team presented a set of recommendations about improvements to the Service's training program and performance, as well as the working conditions of both the supervisors and operators of the Service. The complete recommendations and conclusions of the project are included in both English and Spanish in this report. These recommendations and conclusions were presented to the Service, with the expectation that with the implementation of these recommendations, Information Service 113 will be able to provide improved service to its clients, the Costa Rican public.

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CHAPTER 1 INTRODUCTION

Since 1963, the Instituto Costarricense de Electricidad (ICE) has had the responsibility of providing quality telecommunication services to Costa Rica. ICE Telecommunications (ICETEL) utilizes much of the latest technology in order to provide the best possible service, and it offers a vast number of teleservices to its customers. ICETEL's main objective is not only to provide quality services to its customers, but also to be competitive in the world telecommunications market.

In order to better serve its customers, ICETEL offers a number of Information Services, which the public can use to voice comments and complaints to the company and to solicit various types of information. Specifically, the Information Service 113 department of ICETEL is a telephone number solicitation service, which can be used by the general Costa Rican population to request residential, commercial, governmental, and public telephone numbers.

With the pending issues of the privatization of ICE, Information Service 113 is concerned with the quality of service that it provides to its customers. Presently, the Information Service 113 department receives 2.6 millions phone calls per month. The Service is active twenty-four hours a day, 365 days a year. The 150 operators currently working at Information Service 113 alternate in fifteen shifts. There are 72 stations at the service, which are all utilized during the times when the majority of calls are received.

To evaluate the operators who respond to these calls, the conversations between the operator and customer are evaluated and reports are created from these reviews. These evaluations are done in two ways:

1) *The supervisor can review a recording of the call made using AutoQuality, part of a Performance Suite software package, or*

2) *The supervisor can listen to the calls as they happen.*

While listening to a live conversation, the supervisor can interrupt the call at any time to speak to the client or operator. Currently, the Service only records and evaluates 3% of the incoming calls, but with the vast number of calls received each month this process is flawed and extremely time-consuming. The entire process is manual, meaning that for each evaluation, one of the supervisors at Information Service 113 must listen to each call being evaluated, and then manually create a report of the operator's performance during the call. The personnel at the Service consider this to be a very inefficient process (K. Arana Puente, 2000).

The goal of this project was to provide Information Service 113 with an overall view of its recent performance, as well as the ability to recreate this view to evaluate its future performance. Over the course of the eight-week period, the team developed a method for analyzing the Service's existing data, which was used to create a general rating of its present service quality. From this rating, the group produced recommendations for future improvements to the Service. For this project to have any long-term value to Information Service 113, there needed to be some way of replicating the results of the project in the future. The students designed a program that will allow the Service to create similar reports to this project. If the Service has the ability to recreate the overall view of its performance, it can then use this information to determine whether its service performance has declined or improved.

In addition to providing Information Service 113 with a method to evaluate its overall performance, this project also defined a rating system for the operators working at the Service and determined an average performance rating for the operators. The group made recommendations about what to do with the different levels of operators that exist. These included suggestions regarding what can be done with the operators in lower levels as well as what type of rewards, if any, could be given to the operators in the highest levels.

In addition to requiring reports concerning the performance of the Service and its operators, the Quality Control Department of Information Service 113 needed a way to make its system of evaluation more efficient. The IQP team developed an intranet-based evaluation program that will assist the supervisors working at the Service, as well as a manual describing its use and how to make future modifications.

The Interactive Qualifying Project (IQP) is described as "...challeng[ing] students to identify, investigate, and report on a topic examining how science or technology interacts with societal structures and values. The objective of the IQP is to enable WPI graduates to understand, as citizens and as professionals, how their careers will affect the larger society of which they are a part" (Worcester Polytechnic Institute, 1999, http://www.wpi.edu/Academics/Projects/intro.html). The problem given by ICETEL linked together the two areas of technology and society. The technology-based evaluation solutions that this project provided will not only improve the working conditions of both the supervisors and operators at the Service, but will also allow the Service to offer a superior quality of service to the Costa Rican community as a whole.

CHAPTER 2 LITERATURE REVIEW

2.1 BACKGROUND INFORMATION

2.11 Instituto Costarricense de Electricidad

The Costa Rican Institute of Electricity [ICE] is a government-run agency, which controls the electric, telephone, and power systems for Costa Rica. The ICE Corporation is divided into four sub-companies, *ICE Electricity* [ICEELEC], *Radiográfica Costarricense* [RACSA], the *Compañía Nacional de Fuerza y Luz* [CNFL], and *ICE Telecommunications* [ICETEL]. This project will deal directly with ICETEL, and in particular, the service quality provided to the company's customers.

2.111 History of ICETEL

In the 1950's, Costa Rica's telephone services were based on a manually operated system, which served around 10,000 clients. Due to the growing demands on the telecommunications industry in Costa Rica in the 1950's, this system soon became obsolete. In order to keep up with the increasing need for advances in the telecommunications industry, it was necessary for the market to grow.

2.1111 1960-1980

By 1963, the *Instituto Costarricense de Electricidad* [ICE] controlled the operations and development of all telephone, radio, and radiotelegraphic communications services, under law number 3266 (ICETEL, "Historia," 1999). In 1966, ICE installed the first automatic exchanges, and by the early seventies there were already 24 of these

exchanges located throughout the population centers of Costa Rica (ICETEL, "Historia," 1999).

During the seventies, the automatic exchanges spread to more rural areas, allowing new telephone services to become available in these areas. The number of public telephones in both rural and metropolitan areas grew tremendously during these years. At this point, ICE began to commit itself to developing a universal and democratic system of telecommunications (ICETEL, "Historia," 1999).

During the late seventies, Central America, Mexico, and Panama were connected through the Central American Network of Microwaves. The *Sistema de Marcación Internacional Directa de Abonado* [MIDA] was begun, uniting Costa Rica with Central America, the United States, and the rest of the world (ICETEL, "Historia," 1999).

2.1112 1980 – Present

During the eighties, ICE made some great improvements to its telecommunications system, with increases in the number of telephone lines and the capabilities of international communication. During this era, the telecommunications system began to move from analog to digital technology, in order to extend the important metropolitan exchanges. In the nineties, the telecommunications system began to work to extend its system of long distance services and its urban network (ICETEL, "Historia," 1999).

As the number of lines began to reach its maximum, ICE introduced the system of seven digits. Along with this addition in 1994, ICE introduced the Cellular Telephone Service. By 1997, the number of cellular telephone lines had risen above 65,000

(ICETEL, "Historia," 1999). As Costa Rica's technological abilities developed, ICE began to try a completely computerized system to replace the manual switchboard system in place at the time. With new video-computer technology, the system became both more efficient and reliable.

The next advance to the telecommunications system was the introduction of fiber-optic cables. Through the use of this technology, Costa Rica was able to transmit a much larger number of telephone calls, television programs, and computerized signals at the same time over the increased bandwidth of the cables (ICETEL, "Historia," 1999). The advances that the ICETEL technology brought allowed Costa Rica to enter competitively into the world telecommunications market, connecting itself with the rest of the world.

2.112 ICETEL's Mission

A company's mission statement defines that company's goals for the present, its reason for existence, and its statement of intent. The mission of ICETEL, as translated from the company's web site, is as follows:

> *"To satisfy the necessities and evolutionary expectations of the clients and the Costa Rican society, by means of the opportune provision of services and applications of quality telecommunications and information, to prices and competitive tariffs, with the suitable technology and the best human resource."* (ICETEL, "Misión y Visión," 1999)

Above and beyond a company's statement of intent, it must also have a vision for the future – a statement of the company's goals for the future.

2.113 ICETEL's Vision

Without a vision for the future, a company can never progress past its present state. ICETEL's vision, as translated from the company's web site, is as follows:

> *"To be property of the State, competitive in a world-wide class, and a leader in the telecommunications and information market, with the best technology and human resources to service the client and the Costa Rican society."* (ICETEL, "Misión y Visión," 1999)

With regard to the pending privatization issues, ICETEL's strong vision for the future aims to develop the company's competitive edge not only in Costa Rica, but also in the world market. Aside from the technical advances of telecommunication systems, ICETEL aims also to be competitive in the area of service quality for its customers.

2.12 Information Services

ICETEL currently provides a number of Information Services to its customers, similar to those found in the United States. Several Advisory Services are available, which customers can call to place complaints about telecommunications services or errors in the telephone guide and telephone services. Customers may also utilize a number of Information Teleservices, including services to ask for tourist or international information, or information on cellular services. These Information Services allow ICETEL's customers to actively voice their opinions and complaints about the service that the company provides, as well as provide the customers with numerous types of valuable information, all in one place. Table 2.1, shown on the following page, illustrates the various Information Services that ICETEL provides.

Advisory Services		Teleservices	
225-9792	Receiving calls	**110**	To receive a national call
253-1010	Telephone directory 800-2242323 (Telefax)	**112**	To ask for the time
224-2323	Report omissions and errors in the telephone guide	**113**	To solicit telephone numbers
224-1124	International service	**115**	Information and telephone proceedings (metropolitan area)
223-5353	Telegrams	**116**	Operator-assisted international communication
		119	To report telephone errors
		124	International Information
		192	Tourist Information
		193	Cellular Information
		911	Emergencies

Table 2.1 Information Services provided by ICETEL *(ICETEL, "Servicios," 1999)*

2.121 Information Service 113

One of these services, the one of direct concern to this project, is Information Service 113. Information Service 113 allows customers to call and solicit the telephone numbers of residential, commercial, governmental, and public telephones.

Because ICETEL hires untrained workers from a manpower company to be trained as operators for this service, quality control becomes an issue. The performance of the operators who receive and handle the incoming solicitations of Information Service 113 is frequently evaluated. To better understand the evaluation and rating of an operator's performance, one must first have a good comprehension of the area of service quality.

2.2 SERVICE QUALITY

2.21 Defining Quality Service

Service quality can be very difficult to define unless it is divided into various areas, such as customer comprehension, company reputation, training, and goals. In the business world, customer satisfaction ensures a company's long-lasting existence. According to Rust, there are a number of different factors that determine a consumer's satisfaction with a service, as defined above (1994). Therefore, a company must look at its business from the consumer's point of view to understand how to better serve its customers. When a company has taken the time to consider the interests of its customers, it can understand these customers' needs (Schneider, 1995; Rust, 1994).

2.211 Simplicity Leads to Comprehension

A company's ability to provide an easily understandable service can be an important concern for customers. From a customers' standpoint, when a service is too complicated to use, it is not worth his or her time (Butterfield, 1991). If the service can be called up with ease, it becomes more convenient to the customer. The word convenience is used by Butterfield to sum up the ideas of simple usage and access to a service by its customers (1991). This issue also pertains to how easily a customer can get any sort of information through the use of the telephone (Butterfield, 1991; Schneider, 1995).

Communication is another of the customer's concerns. If a service is not easily understandable, the customers cannot make a judgment on whether or not they wish to employ the service. Cost must also be made clear to the customers in a way that they can

comprehend. They must understand the benefits they will receive from this cost before they can make an educated decision about the service. In addition to comprehending the service that a company provides, the customer should also understand that the company is always eager to help them. If customers have a problem, the company must be ready to help the customer resolve the problem, and should also clearly advertise this willingness. For total customer satisfaction in this area, the company must be ready to take responsibility for the customers' needs (Butterfield, 1991; Schneider, 1995).

2.212 Reputation and Satisfaction

A company's reputation also comes into consideration for consumers. When a consumer attempts to establish how trustworthy the company is, the idea of reputation always is considered. The company name may be well known, which might establish some level of trust, and the personality of the company's employees may also be considered. These characteristics not only have to do with establishing a degree of trust with the customer, but also in affirming how reliable the products or services are and how appropriate the prices are (Schneider, 1995; Foxall, 1994).

When employees talk to potential clients interested in the service of the company, they are always representing that company directly. If they know what they are doing and deal with customers in a courteous manner, customers leave with a degree of satisfaction about the service received. The training and skills that the employees receive and may already possess are very important because, as stated previously, the employees represent the company. Some of the aspects that may make customers much more satisfied with their service are how promptly they received answers from employees, the

etiquette and protocol displayed by the employees, and the timely manner in which any information was received. Because the employees are the people with whom the customers deal, customers will most likely use them as a measure of the quality of the service received from the company (Butterfield, 1991; Schneider, 1995; Rust, 1994; Foxall, 1995).

2.22 Measuring the Quality of Performance

In order to better suit the needs of its customers, a company would likely want to self-evaluate the quality of its service in a periodic and systematic manner. This process of evaluation deals with both the consumer and with the employees. The evaluation techniques used are specific to the type of business being run, so various techniques must be considered (Butterfield, 1991).

There are a number of factors that must be considered in order to evaluate how well an employee is performing his or her job: "Tracking productivity requires that you know the volume of work processed and the actual number of paid hours expended in performing the work" (Butterfield, 1991: 28). The evaluation should take into account the volume of work performed by an employee during a standard workday. The comparison between volume of business handled and hours worked is a good measure of employee performance. With good record keeping, a company can determine how productive its employees are on the job. With proper training systems in place, the workers will perform much more efficient transactions between the customers and themselves (Butterfield, 1991; Rust, 1994).

2.23 Training Employees

When a company is looking to provide top quality service, it would likely try to get together the largest applicant pool possible for hiring purposes. This allows the company to choose specific types of applicants for positions where they would be most suited. For a job in which employee has direct contact with customers, an applicant with a personality suited to that type of interaction would be the best person to hire. This is just one example of why a large applicant pool might be desirable to a company (Schneider, 1995).

2.231 Issues with Training

Hiring an employee who is well suited to the job is only the initial step when it comes to presenting a customer with high quality service. Before those employees are trusted to represent the company, they should be trained in how best to serve their customers' needs. Training programs might differ for the various types of positions in a company. For example, a position that requires personal contact with a customer would require a complex training method because it would involve learning to deal with different types of personalities (Schneider, 1995).

Other situations that might require some sort of training would be a cross-cultural job, in which employees would have to adapt themselves to the customs of a foreign culture. Employees can be made aware of these types of issues, but the training necessary for these situations cannot be fully taught. Instead, adaptation evolves through experience and interaction. There is a great deal of information that must be presented to

an employee during training, but it is equally important to train the employee to avoid negative behavior (Foxall, 1995; Schneider, 1995).

2.24 Focusing on Goals

Although a company should always concentrate on the areas of the service that require improvement, it should never take the efforts of its employees for granted. A company can become overly focused on improvement, and it may appear to its employees that the company does not care about their prior hard work. When employees feel that they are being taken for granted, any efforts by the company to improve service quality may quickly become useless (Butterfield, 1991).

According to Butterfield, companies that implement policies of rewards for good service might have a good idea, but rewards alone cannot be trusted as motivation for the employees (1991). In fact, there are a number of ineffective styles of motivation. As an example of negative motivation, threatening employees will most likely be unsuccessful in making them work any harder. Also, an official policy on the improvement of service does not necessarily cause this improvement to occur (Schneider, 1995; Butterfield, 1991).

It is in the best interest of a company to never assume that it is doing enough for its employees. There are always better ways to train the employees. Assuming that the procedures for evaluation and the tools the company uses are adequate is bad practice. A company must strive to improve itself constantly (Butterfield, 1991).

2.25 Quality Control

In order to ensure that service quality is maintained within a company, a company must have a Quality Control Department. This department is responsible for analyzing the quality of every area of service that applies to the company, and should focus on improving it. In the case of Information Service 113, this is done through monthly and weekly reports about the quality of service provided by the Service. The distinction between service quality and quality control is very subtle. In essence, quality control is the maintaining of service quality in a company.

2.3 CURRENT STANDARDS OF SERVICE QUALITY

2.31 Current Standards at Information Service 113

In order to make any kind of valuable recommendations regarding ways to improve the current system at Information Service 113, one must first understand the policies and procedures that are presently in place. By researching how a company functions, one can realize where the flaws are in its system of operation. Once these flaws are identified, a set of recommendations can be created to correct these flaws.

2.311 Description of Present Company Policy

The Information Service 113 department receives 2.6 millions phone calls per month, which are answered by the 150 operators currently working at the Service. The Service contains 72 call-stations, which are manned according to how busy the service is at a particular time. The operators are hired from a manpower company, and then trained to respond to the calls received by the Service. Since the operators come to the Service

untrained, it is necessary to evaluate their performance over time. These evaluations are based upon the level at which the operator performs when answering incoming calls (K. Arana Puente, 2000).

2.3111 Procedure for Evaluations

The evaluations begin as soon as a call is received from a client. The operator must first identify the Service, give his or her name, and offer a salutation. When the customer asks for information, the operator starts a search for the information. Once the correct information is found, the operator relays the information to the customer. The supervisor can evaluate the operator's performance during such calls in two ways. The first way is to listen to the calls as they occur, with the ability to interrupt the call at any point if necessary. The benefit of this method is that the supervisor can immediately correct any significant errors made by the operator. The second way is to listen to a recording of the call made using AutoQuality, a component of the E-Talk Corporation's Performance Suite software package. The benefit of this method is that the evaluation can be made at any time using the recording. The procedure for these evaluations can be found in Figure 2.1, on the following page (L. López, 2000).

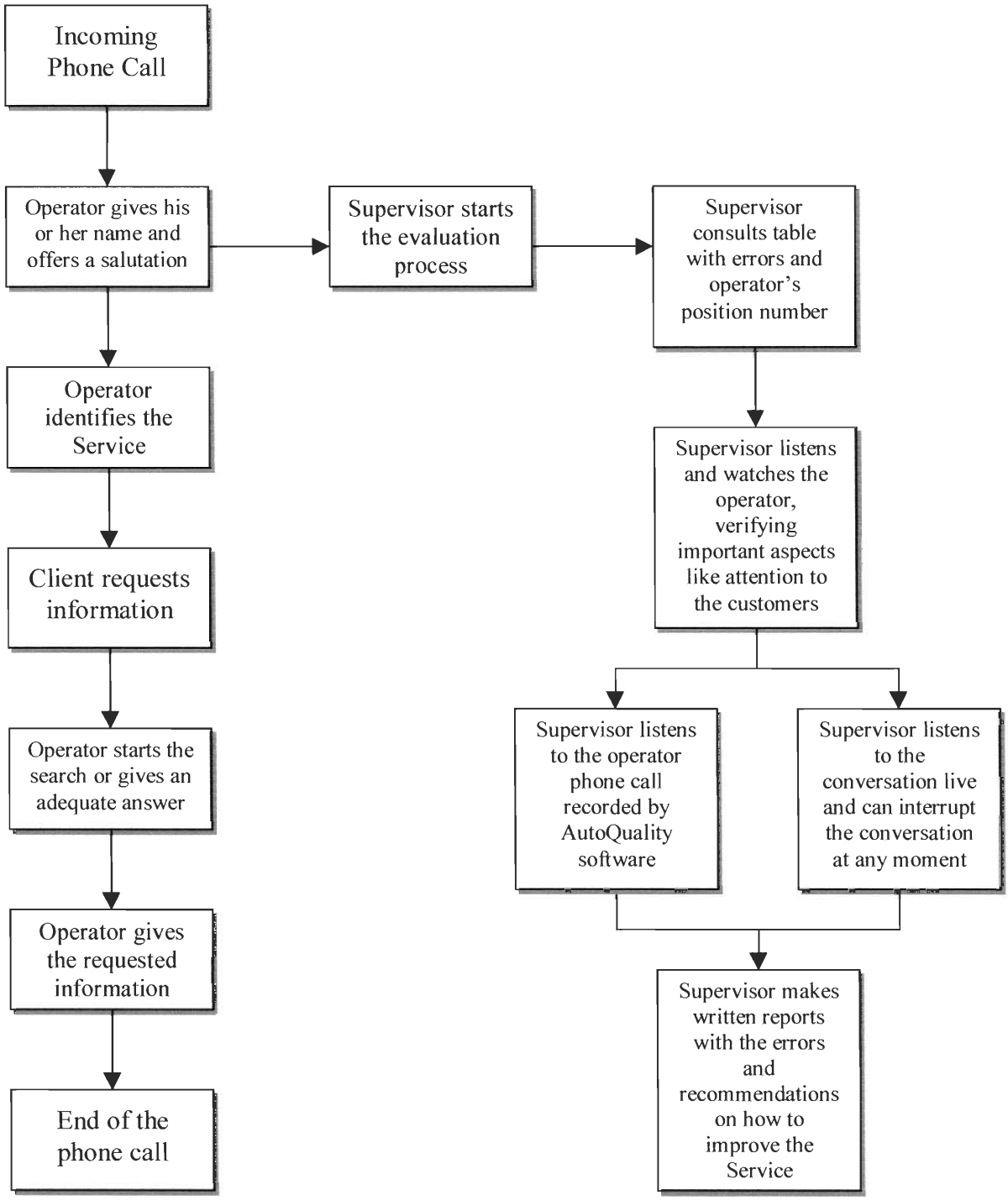

Figure 2.1 Current Procedures for Incoming Calls

(L. López, 2000)

2.3112 Creation of Reports

Before reports can be created, the evaluations described in Section 2.3111 must be scheduled and carried out. The Quality Control Department enters an operator's name, shift, and scheduled time of evaluation into the AutoQuality program. The program automatically makes two 10-minute recordings each week of the telephone calls responded to by the operator. The supervisors review these recordings, listing the errors that the operator committed during the recordings. This list of errors is compiled into a weekly operator performance report by the Quality Control Department.

The SITEL supervisors (see Figure A.1) working in the operators' room give these reports to the operator, who can then contest the errors in the report. Later, he or she can schedule a time with the Quality Control Department to review the recording in question. If the operator did not, in fact, commit the error in question, then changes can be made to the weekly report accordingly.

Once each of the operators has had the opportunity to contest his or her weekly reports, Leda López Venegas, Coordinator of the Quality Control Department, compiles a general weekly report about the total percentage of errors committed that week. These general weekly reports are then sent to two different places. The Quality Control Department compiles the weekly reports into a monthly report about the total percentage of errors committed that month. Using the information from the weekly reports, as well as information from the central computer, the Production Department creates a final monthly production report with information about the total number of calls received and attended to, the cost of errors, etc.

From these two monthly reports, the Quality Control Department then creates a monthly quality control report, which is presented each month to Ing. Katia Arana Puente, Director of Information Service 113. Included in the report is the percentage of calls with errors, the amount that SITEL is charged for these errors, and cumulative totals of all information collected for the month. See Figure 2.2, on the following page, for a detailed flowchart of the procedure for creating these reports.

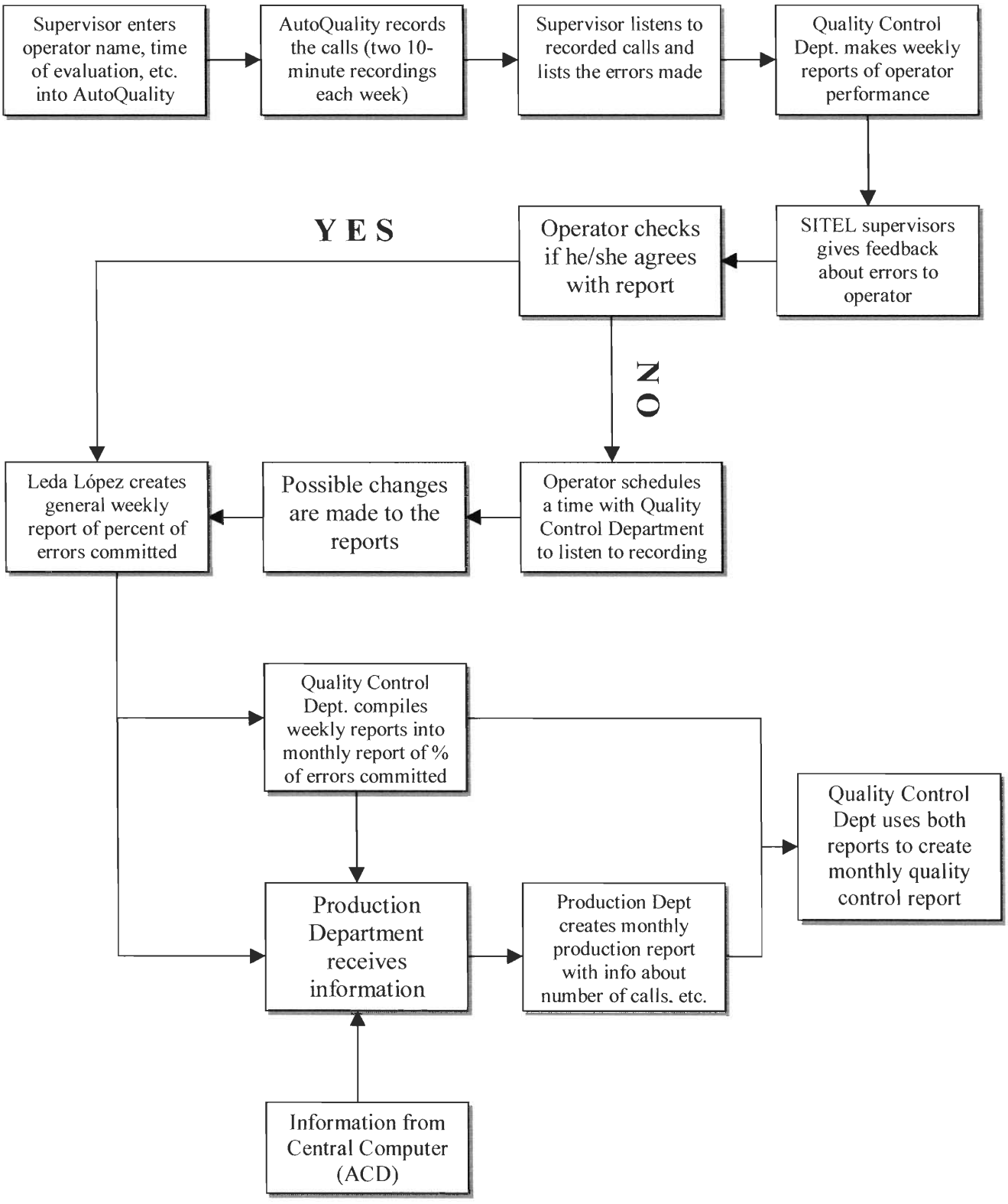

Figure 2.2 Procedure for Creating Reports

2.312 List of Possible Errors

Using a list of errors, given below, the supervisor rates the performance of the operator, putting the results into a report. These reports are used to record the errors made by the operators, as well as to make recommendations as to how to correct these errors. The reports can be used to determine whether an operator's performance improves over time, or whether some measures are required to promote superior performance.

1. Uses the service for personal calls
1.1 Chats with the client instead of offering a service
1.2 Answers phone calls on other's operator station

2. Does not give service
2.1 Does not give the right telephone number even having the number on the screen
2.2 Does not say anything, causing the client to hang up
2.3 Abandons his post without signing off the service and the client is not attended
2.4 Does not give the city code, that he knows the client needs
2.5 Does not wait for the client to stop talking

3. Does not apply sensitivity with the client
3.1 Missing sensitivity
3.2 Rude
3.3 Curt
3.4 Fights with the client
3.5 Argues with the client
3.6 Missing courtesy

4. Does not answer the phone in a proper way
4.1 Leaves the client on hold for too long
4.2 Chat with other workers while client is on the line
4.3 Does not pay attention to the client, forcing him/her to repeat him or herself.
4.4 Cuts off calls
4.5 Is distracted

5. Does not ask for enough information to continue the search
5.1 Does not find the correct information
5.2 Does not uses the key word that the costumer says to try to find the phone number

6. Inefficient service

6.1 Gives the wrong information to the client

7. Disinterested

7.1 Does not make enough effort to try to find the information asked

8. Omits identity

8.1 Operator does not identify the service or her/himself

9. Error 9 non-existent

10. Imposes his or her opinion

10.1 Gives the client the information that him or her thinks that the client is looking for.

10.2 Does not try to talk to the client and get the appropriate information to find the phone number required

(L. López, 2000)

2.313 Current Software Used in Evaluations

E-talk Corporation, formerly known as Teknekron Infoswitch, is a leading world-provider of Computer Telephony Integration [CTI]. BankBoston estimated that E-talk has "approximately 50% of the market for monitoring and performance management... [with] over 800 systems installed – hundreds more than [its] nearest competitor" (E-Talk, "Product Description," 1999: 2). Chosen as one of the United States' Top 250 Telecommunications Companies in 1998 (E-Talk, "Product Description," 1999: 5), E-talk distributes its *Performance Suite* to companies and call centers around the world. E-talk's *Performance Suite* is a compilation of a number of programs used to evaluate and process service quality, including the program currently used by Information Service 113, AutoQuality.

2.3131 AutoQuality

AutoQuality was introduced in 1993 as a state-of-the-art recording platform for call centers (E-Talk, "AutoQuality," 2000). AutoQuality allows continuous logging of voice data and records screen activity, so that administrators can evaluate both the voice transactions and screen playback of a particular call. Data about customers or call center operators can be attached to the calls, both to identify particular calls as well as ease the evaluation process by having such data readily at hand. Calls that are logged using AutoQuality can be immediately retrieved, either from a computer hard drive, a networked drive, or external media (E-Talk, "Product Description," 1999: 6). Case studies of AutoQuality can be found in Appendix B.

2.31311 Features

AutoQuality contains a number of helpful features that can assist a call center in the evaluation of its operators. One such feature is the screen recording option. AutoQuality contains a variety of screen capturing methods, including Video Style [records every action], Basic [system administrator sets the program to capture the screen at a preset interval], Intelligent [business applications determine screen captures], and User Data Attachment [data such as telephone numbers can be attached to calls] (E-Talk, "Product Description," 1999: 9). Rather than retrieving archived call recordings, supervisors have the option of monitoring a call [using voice, screen captures, or both], with the option of saving the recording later.

AutoQuality allows for manual scheduling of the recording dates and times, so that recording schedules can be created in advance. This feature simplifies the process of

recording a certain percent of total calls received, while evenly distributing the number of recorded calls received by each operator. While reviewing and evaluating the calls, supervisors can also make annotations, either through voice files or on-screen notes and marks (E-Talk, "Product Description," 1999: 10). This makes it much easier to create reports on a specific operator or groups of operators, using the review notes to assist in writing the report.

2.31312 Benefits

The purpose of a call-logging product such as AutoQuality is to review and evaluate more efficiently the performances of operators. There are a number of ways in which the program allows for this improved efficiency. AutoQuality can be set to record calls at various times during the day, on various days of the week, as an operator's performance can likely change according to the time and day (E-Talk, "Product Description," 1999: 15). The program can also be used to more efficiently playback the calls – searching the call archives by customer name, date and time, or operator's information, skipping over any unnecessary recordings (E-Talk, "Product Description," 1999: 14).

A beneficial way to improve an operator's performance is to have that operator review his or her own recorded sessions. By reviewing his or her own mistakes, the operator will be less likely to repeat such mistakes in the future.

2.3132 Orchestra

The Orchestra program, also by E-Talk Corporation, is a database search program. Orchestra is the program used by the operators working at Information Service 113 every day. The program has various fields that are entered by the user, including first name, last name, location, and type of telephone number. Once the user has entered adequate data, he or she uses a macro to begin the search of the database. The results are displayed on the screen, and the user can simply select the letter next to the desired entry, causing Orchestra to automatically read the telephone number to the client on the telephone. Statistical data about the number of calls received, the number of calls answered by the user, and the average time spent per call is displayed on the screen at all times. There is also a window that displays how many calls are waiting to be answered and how many people are using the system, which is also displayed at all times.

However, Information Service 113 has a number of technical problems with Orchestra. The first of these is that the automatic responding unit [ARU] – the command that should automatically dictate the selected number to the client – does not always work. Often times the program simply does nothing, requiring the operator to notice this and manually read the number to the client. Other times the command for the ARU needs to be entered multiple times before it works. Also, the window displaying the statistical data about calls does not work properly. The information displayed in the window is most often incorrect, and therefore useless to the operators.

For the operators, there are three main areas of concern with Orchestra. The first issue is speed. Since the operators are paid per call, their time is very valuable. The

faster they can find a number and give it to the client, the more calls they will be able to answer. The second issue is efficiency. When the Orchestra program does not work correctly, it forces the client to wait until the error is noticed, and is a major annoyance to the operators. The third issue is appearance. The appearance of the program can have a definite effect on the mood of the operator, which in turn can affect the performance of that operator. These three issues were examined in more detail in the operator survey described in Section 3.11.

2.314 Other Available Software

Along with AutoQuality and Orchestra, Information Service 113 currently has other software installed on their computer systems. Among these is the program P&QReview, also from E-Talk Corporation. However, the company has, as of yet, been unable to successfully integrate AutoQuality and P&QReview. Being able to integrate these two programs would be extremely beneficial to the Service and its system of evaluation. However, outside of simple recommendations, assisting in this integration is well beyond the scope of this project.

2.3141 P&Q Review

In order to effectively evaluate the performance of a company's employees, the company must not only collect sufficient data, but must also take action according to what the data indicates. In the case of a call center, recording telephone calls and the performance of the operators is only the first step. The information from the phone calls must be reviewed and evaluated, so that proper measures can be taken. "[Successful] software solutions turn agent performance data into useful service information. This

gives you consistent feedback that increases morale and promotes agent growth. And by making this data available throughout the call center ... you can improve quality and effectively reduce costs... and achieve better customer service within your entire organization" (Teknekron Infoswitch, "P&Q," 1999).

P&Q Review, part of E-Talk's Performance Suite, absorbs all of the data gathered from a call center – such as data recorded using AutoQuality – and allows a company to more easily interpret this data. Using P&Q Review, a company can create different charts and reports that can measure many different areas of performance (E-Talk Corporation, "P&QReview," 2000). The company can define which aspects of performance are most important to its operations, and P&Q Review will produce graphical results of the evaluations of these pre-defined aspects.

Supervisors can define the quality against which the employees will be evaluated, making the system fairer and less biased than completely manual evaluations. Since all of the employees are rated against the same standard, P&Q Review can produce an unbiased comparison of the quality of service provided by each employee. The program is set up like a web page, although it does not actually utilize the World Wide Web, and makes use of a company's intranet (Teknekron Infoswitch, "P&Q," 1999). This allows any authorized employee to view the evaluations over the company's intranet. If a company correctly sets its restrictions on the web page so that each employee can view certain aspects of other employee's reviews, this could easily promote positive competition among the employees to improve. Case studies of P&Q Review can be found in Appendix B.

2.3142 Active Server Pages (ASP)

Active Server Pages [ASP] are components that are embedded in HTML, or web page code, that allow access to information in a database or the creation of other interactive output. ASP can be read by almost any browser, and can be written in any tool used to write HTML such as Notepad, Microsoft Frontpage, and Dream Weaver. They can be used in conjunction with such databases as FoxPro, Microsoft Access, and Microsoft SQL Server. ASP can be used to create a database application where information is taken from a database and placed into the page in the browser, and information can, in turn, be sent to the database where it is stored for future use. The drawback of ASP is that the code must be hosted on a server to operate properly. It does, however, allow for many simultaneous users, and faster speeds than CGI scripts, which allow for the same type of dynamic interface (Asp-Help.com, 2000).

2.32 Standards and Strategies of Other Companies

When evaluating its current procedures, a company can rate its performance in two ways: It can rate itself according to its past performance, or it can rate itself against the performance of other companies. The following section discusses the standards and procedures of a well-known United States telecommunications company, the NYNEX Corporation.

2.321 NYNEX Corporation

The plan that was used by the former telephone company NYNEX involves three steps of ensuring quality service. These are the ideas of planning, feedback, and review. The three concepts work together in a cycle to form the basis of the service that is provided by the company (NYNEX, "Performance Management Process," 1994).

The planning process is used to develop goals and a plan of improvement. Once goals are set the company has a clear objective of what level of service they should be providing, and also how to judge the service being provided with more accuracy. A plan of improvement involves where the goals of the company in terms of service should be set in years to come. This also means that the company has to set its goals at an attainable level, and then raise the expectations as it improves (NYNEX, "Performance Management Process," 1994).

Providing useful feedback is important for the employees of the company. This will allow the employees to better understand where they stand in terms of accomplishing their part of the company's policy. The information, comments, and evaluations that the company provides include performance reviews and general reinforcement of above-average performance.

A performance review is the way in which the company rates employees, and rewards exceptional performance. The company provides monthly, mid-year, and annual performance reviews. The annual reviews are evaluated, and if employees do an outstanding job over the course of the year they will be rewarded for their exceptional

performance. This is a motivational factor for the employees to continue to provide better service quality (NYNEX, "Performance Management Process," 1994).

2.4 Current Concerns Pertaining to Information Service 113

As described in Chapter 1 of this report, Information Service 113 is looking to better serve its customers. An area that it wishes to improve upon is its current evaluation procedure. Through improving its policy, the Service is looking to create a process that will more effectively utilize the employees who manually perform the evaluations. By creating a new system of reports to be stored in a database, the Service is looking to monitor different aspects of the errors in its service. These aspects include the most frequent errors made by the employees, which types of errors employees can make, and the costs of the different types of errors to the company. These improvements are currently being examined to determine how customer service might give the company an advantage as the Costa Rican telecommunications industry moves towards privatization.

CHAPTER 3 METHODOLOGY

The main goal of this project was to provide ICETEL with an overall view of their recent performance in the area of service, as well as the ability to create and modify this view in the future. In order to realize this goal, there were main three objectives that were developed by the project team:

1) *Create and define 3 (or more) levels of operators as a rating system*
2) *Use these levels, the data provided by the company, and the group's own research to create a panoramic view of Information Service 113's performance over the last year and a half*
3) *Create a method for Information Service 113 to replicate our methodology after the team's departure*

Over the course of the eight-week period, the project team was able to effectively incorporate the third objective into each of the first two, thereby effectively eliminating it as an individual objective. However, in the course of its research, the group was able to successfully develop and implement an additional main objective to the project:

4) *Design and implement a program to facilitate and improve the current system of evaluation and the creation of reports.*

The project team felt that the results of this additional objective would prove invaluable to Information Service 113, and so once the original two objectives were completed, the team turned its efforts to this new objective.

3.1 INFORMATION GATHERING

Before the team could complete the goals described in the previous section, it was necessary to gather data and information from Information Service 113. The first necessary information was quantitative data about the present and past performance of both the Service in general, and of the operators working at the Service. Information such as the total number of calls received during particular months, the number of calls that are responded to each month, the number of errors committed each month, and the most common types of errors was collected from the Service.

In order to develop a rating for the Service and its operators, it was first necessary to understand the Service's current policies and procedures of evaluation. Through personal communications with Leda López, Coordinator of the Quality Control Department, and Viqui Castro, Coordinator of the Production Department, the IQP group was able to determine both the Service's current procedures for evaluation and its current procedures for creating reports, which can be found in Sections 2.3111 and 2.3112, respectively.

3.11 Development of Surveys

Since the operators working at Information Service 113 are integral to the performance of the Service, the students felt it important to understand what the operators think about the Service. Before a set of solid recommendations could be made to the Service, it was necessary to understand the operators' opinions about their working conditions, the training they receive, and the equipment that they use. Because the

operators' time is very valuable to them, the group felt that a survey would be the least invasive and most practical method to collect this type of data from them. First, the team members created a list of all of the main areas of information they wanted to receive through the survey. This list included:

- What do they like/dislike about the working conditions?
    a. Hours
    b. Pay
    c. Programs
- What do they like/dislike about the training?
- Why do they commit so many errors?
- What do they think could change to make things better?

It was then necessary to create the specific questions that would be asked in the survey. Before this could be accomplished, the group first broke down the list above into general topics for questions. These topics were then later reworded into the specific questions in the survey. The main topics were:

- Time the operators work
    a. Shift
    b. Day
    c. Time
    d. Breaks, amount of time they work a week.
- Opinions about the software
    a. AutoQuality (See Section 2.3131)
    b. Orchestra (See Section 2.3132)
- Thoughts about the Service itself
- Opinions about the training they received
    a. Effectiveness of training
    b. Possible improvements
- Any other comments, suggestions for improvements, etc.

The group then determined the questions that would represent the topics in the survey. The questions consisted of a number of fixed-response questions (response chosen from a pre-defined Likert scale), two open-response questions (response written by those surveyed, with no restrictions), and one dichotomous question (response is either

yes or no). Any questions about the AutoQuality program were omitted from the survey, because the students were already aware of the operators' dislike of the program, and because the group did not have the ability or authority to change the program at all. The first draft of the test survey can be found in Appendix C.

It was necessary to field-test this survey, and so the team chose a random sample of 10% of the operators and distributed the test survey to them. The size of the sample was chosen because the group only realistically expected a return rate of 75% or less. A sampling size of 10% would provide an adequate amount of information, while still permitting a final survey sampling size that would represent a large enough percentage of the operators.

When the results of the test survey were received, the IQP team found that some changes to the survey were necessary. The day/time part of the first question was removed because it was extremely unclear and produced varied and confusing results. The operators misunderstood the feedback part of the seventh questions, so the team rephrased the question and moved it to the end of the seventh question, so that the parallel structure of the question was maintained. The final survey can be found in Appendix C, following the test survey.

On 10 June, 2000, the students gave the 134 final operator surveys to Glen Calvo (Refer to Figure A.1), who distributed the surveys to the operators over the course of the next two weeks. At the end of the two weeks, exactly 50% of the operators had returned completed surveys to the students, including the original 10% test sample. This was decided to be an adequate final sampling size since a majority of the remaining 75 operators were either on vacation or in training, and were unable to complete the survey.

The results of the final survey can be found in Section 4.1. From these results, the project group was able to create a set of recommendations, which can be found in Section 5.1.

3.2 Rating System for Operators

After gathering an adequate amount of information about Information Service 113 and the operators working therein, the first objective completed by the project team was to create a system of rating for the operators currently working at the Service. In order for this objective to be realized, the IQP team undertook a number of necessary steps. First, the group determined the optimum number of operator levels.

3.21 Creating Operator Levels

For a class system to be useful to the Service and fair to the operators, it must display a clear range of evaluation, with distinct upper, middle, and lower levels. For this reason, the team decided that the number of levels should be either three or five. A three-level system allows a clear distinction between good, bad, and mediocre, but does not allow for a differentiation between good performance and excellence. A five-level system, known as a Likert scale (Pietroforte, 2000), includes an elite upper level of operators, as well as two different levels of poor performance. The lowest level is reserved for those operators for whom some drastic measure is necessary, with the understanding that no operator's performance should ever reach this level of inadequacy. Because of the greater flexibility and usefulness of the Likert scale, the team determined that the optimum number of operator levels was five. However, these levels were essentially useless without a method to place the operators in one of the five levels.

Consequently, the project team developed a method to give a numerical rating to each operator.

3.22 Developing a Method of Operator Rating

The operators currently working at Information Service 113 have only one task: to respond to the incoming solicitations from clients in an efficient manner, without committing errors. From a customer standpoint, a correctly answered call is one in which the operator does not perform any or the errors listed in Section 2.312. The group decided that the quality of performance of each operator would be reduced by incorrectly answered calls. As described in Chapter 1, the supervisors of the Service evaluate three percent of the calls that each operator receives. From this information, the team derived the following formula to determine a monthly percentage rating for the operators working at the Service:

$$100\% - \frac{\text{\# of evaluated calls with errors committed}}{(\text{Total \# of calls received by operator}) \times (0.03)}$$

From this formula, each operator starts with a monthly percentage rating of 100%, signifying a perfect performance with no errors. This percentage is lowered by the ratio of incorrectly answered calls (those with errors) to the total number of calls evaluated by the operator (3% of the total calls receive by the operator). The team felt that it was important that the operators did not feel that they were being forced to prove themselves to earn a good rating. The formula gives the percentage of evaluated calls that are correctly answered, but when written in the manner described above, it ensures that the operators understand that they are all starting from a 100% rating, rather than zero. Once

a method for determining numerical ratings for the operators was created, the students then determined the ranges of ratings for each of the five levels.

3.23 Ranges of Operator Ratings

Because Information Service 113 desires to have a 93% efficiency rating, it was determined that a good operator should perform near this rating. A lower rating is still acceptable, since it is difficult to realistically expect 150 operators to all perform excellently all of the time. However, meeting the desired rating of 93% should not denote excellence. For an operator to reach a level of excellence, he or she would need to perform above the expectations of the Service. For these reasons, the project team initially developed the following ranges of operator ratings, which was later changed:

A	[100 – 95]	Excellent
B	(95 – 90]	Good
C	(90 – 80]	Acceptable
D	(80 – 70]	Poor
E	(70 – 0]	Unacceptable

A problem developed when the operator grades were calculated and the operators were placed into their respective levels, however. Every one of the 121 operators who were placed into the levels (the group was unable to receive data about 9 weekday operators or the 20 operators who only work weekends) was performing at an "excellent" level, according to these grade ranges. By looking at the distribution of grades, which can be seen in Table 4.1, located on page 55, a new system of ranges was created:

A	[100]	Excellent
B	(100 – 99.4]	Good
C	(99.4 – 98]	Acceptable
D	(98 – 95]	Poor
E	(95 – 0]	Unacceptable

This new system of ranges provides a distribution similar to a modified Bell-Curve. Classes A and D will generally contain the smallest number of operators, since class A is meant only for those operators performing well above expected levels, and there should not be a large number of poorly performing operators. Classes B and C should contain the largest number of operators, since the two classes signify average and above-average performance. Class E is what makes the Bell-Curve slightly modified, since the number of operators in this class should always be zero, causing the Bell-Curve shape to realistically fall between classes A and D.

3.24 Method for Replicating Results

Once the IQP team created a system of levels and a method for rating the operators at Information Service 113, it proceeded to develop a method for Information Service 113 to interpret these results and recreate them in the future. The group considered a number of computer-platforms that would be able to replicate the results of the project and display them in a meaningful manner. Microsoft Access could easily create the necessary reports, but was incapable of displaying the results graphically. Because of its ease of use and accessibility, a Microsoft Excel worksheet was chosen as the most effective platform.

Within the Excel worksheet that the group created, there is a list of each of the operators working at Information Service 113. The supervisors of the Service must fill in only two columns in the worksheet, which refer to the number of calls received by each operator and the number of errors in the evaluated calls. The worksheet uses pre-programmed formulas to determine the percentage of calls evaluated incorrectly, the percentage of calls evaluated correctly, and the individual level of each operator (A, B, C, D, or E). The worksheet has a graph linked to this information that will show the Service at a glance how the operators are performing in comparison to one another.

Since the performance of the operators working at Information Service 113 does not directly dictate the performance of the Service in general, the students next concentrated on the second objective of the project, rating the performance of the Service.

3.3 Panoramic View of Information Service 113

The second main objective of the project was to create a panoramic view of Information Service 113. The group struggled with developing a method to rate the overall performance of the Service. Using the data and information collected from the Service, the group tried various methods of combining data. Finally, the group devised a system that simplified the process. When considering quality control with a Service like Information Service 113, the service provided could be measured by what the public using the Service sees. Because Information Service 113 exists solely to provide a service to the Costa Rican public, it would be an evaluation of what the client perceives rather than an internal evaluation of the company that would provide the Service with a

useful rating of its performance. There are two possible occurrences that lower the quality of service provided by Information Service 113:

1) A client's call to the Service is not answered, or
2) One of the errors listed in Section 2.312 is committed during an answered call.

For these reasons, the team decided that an effective measure of the Service's performance would be the percentage of received calls answered correctly. Using the following formula, the group was able to determine a monthly percentage rating for the Service:

$$\frac{\text{(Total \# of received calls)} - \text{(\# of unanswered calls)} - \text{(\# of calls with errors)}}{\text{(Total \# of received calls)}}$$

3.31 Developing a System of Classes

Once the students determined a formula for creating a monthly numerical grade for the Service, it was necessary to create a way of interpreting these grades. The project team decided that a five-class system would be effective, for the same reasons a five-class system was chosen for the operator evaluations described in Section 3.21. Information Service 113 currently desires to have a 93% efficiency rating. This fact greatly influenced the ranges of grades that the students decided upon:

1st	[100 – 95]	Excellent
2nd	(95 – 90]	Good
3rd	(90 – 80]	Acceptable
4th	(80 – 70]	Poor
5th	(70 – 0]	Unacceptable

A company should always strive for excellence. Information Service 113 desires a minimum rating of 93%. However, in order to constantly improve itself, this 93% rating cannot be considered excellence. The class system shown above forces the Service to work to improve at all times. Also, the simplistic nature of this class system allows for future modification. As the Service improves over the years, the lower-end grades of each class can be raised, thereby forcing the Service to constantly set its goals higher.

3.32 Method for Replicating Results

Once the rating and grade system for the Service were created, the IQP team was faced with the task of creating a way for the employees of the Service to interpret the information. Again, because of its ease of use and availability, a Microsoft Excel book was chosen as the most effective way to accomplish this task.

Within the Excel book, the group created a set of individual worksheets for each year from 1999 through 2005. Within each of these worksheets, information such as the total number of calls received, number of calls answered, number of calls with errors, and percentage of calls answered correctly are broken up by month, with the results displayed both numerically and graphically. The group also prepared a worksheet with the results

of every month from 1999 to 2005 displayed numerically and graphically, so that the Service can see at a glance its overall trend in performance.

The students then decided that the Service should be able to compare its average performance from year to year as well as during particular months. The group created one worksheet that compares the average yearly performance of the Service, and twelve worksheets that compare the Service's performance during a particular month from year to year. From these reports, the Service can determine trends in its performance, and can tell whether its performance is improving over time, remaining the same, or declining. The project team linked each of the reports to the original worksheet, so that the supervisor creating the reports only has to fill in three columns in the original worksheet (number of calls received, number of calls not answered, and number of calls with errors) for each month. Once these columns are completed, the links that the group created automatically fill in the rest of the cells in the worksheet, and create the reports described above.

3.4 Improving the Current System of Evaluation

As described in Chapter 1, the current system of evaluation at Information Service 113 is completely manual. The supervisors of the Service listen to hours of calls each day, writing down with pen and paper each time an error is committed by an operator. Along with the list of errors committed is a written description of each error, written at the time of each evaluation. Given the fact that each of the 150 operators currently working at the Service is evaluated twice each week by the supervisors, the supervisors' jobs are extremely time-inefficient. In addition to the tedious evaluations, the Quality

Control Department must also use these hand-written lists of errors to create monthly and weekly reports about operator performance.

The project team was faced with the difficult task of making the current processes of operator evaluation and report creation more automatic and time-efficient. By increasing the speed and efficiency of the evaluation process, the supervisors would be able to more quickly evaluate the operators. Not only would they likely enjoy their jobs more, but the possibility of also increasing the percentage of calls evaluated would also exist, which would make the operators much more content.

Nevertheless, in order to do this, the team first had to decide on a computer-platform that would be able to meet the needs of this objective. Microsoft Visual Basic could have been a very good choice for creating this type of program. However, the scope of the program was well beyond the programming capabilities of the group members. Microsoft Access and Excel were examined, but used as stand-alone programs, neither would allow for the automatic entry of data needed. One of the most problematic issues with each of these platforms was that the supervisors all worked at separate computers located in various places in the Information Service 113 building. The project team then realized that the network connecting these computers could be utilized using an Intranet-based evaluation web site.

The user-friendly environment of a web-based system would allow the supervisors to easily and quickly enter data into their computer as they listened to and evaluated calls. This data could then be entered into a Microsoft Access database to be stored and later utilized. At this point, the second major problem with this system was introduced. The project team was unable to move the data from the web site into the

Access database. However, with the assistance of Jon Magnussen, a junior at Worcester Polytechnic Institute at the time of the completion of this project, a solution to the problem was developed using Active Server Pages [ASP] (See Section 2.3142). Although the system could not be implemented on the Service's Intranet server due to a lack of knowledge in the area by the team, a set of recommendations were developed to implement and use the program, which can be found in Section 5.4.

From the web site, supervisors can login using a secure password, and complete the operator evaluations using a simple series of pull-down menus and text boxes. The information is stored directly into Microsoft Access, which can then automatically create weekly and monthly reports according to the needs of the Service. There is also an administrator login with its own secure password, where the names of individual operators can be added and deleted, and passwords to the system can be changed. Because the system is located solely on the Service's Intranet, and since it can only be accessed from a supervisor's computer using a secure password, there is minimal risk of a security breach in the system.

CHAPTER 4 DATA PRESENTATION AND ANALYSIS

Before recommendations could be created and presented to Information Service 113, the data collected during the eight-week period and the results obtained from this project were analyzed. The results of the various parts of the project are presented in this Chapter, where the information contained in these results was analyzed and interpreted. Because the employees of Information Service 113 speak only Spanish, this Chapter in its entirety can also be found in Spanish in Appendix M. The first set of data examined was the results of the survey distributed to the operators at Information Service 113.

4.1 Results of Operator Survey

Once a large enough number of operator surveys (See Appendix C) had been returned to the IQP team (due to operators on vacation and undergoing training, only 75 out of the 150 surveys distributed were returned), the group compiled all of the results into a Microsoft Excel worksheet (See Appendix E). The results of the questions from which the most information could be gleaned were investigated thoroughly, and the graphical and written analyses of these results are presented in this Section.

4.11 Fixed-Response Questions

The first set of questions that the project group analyzed was the fixed-response and dichotomous questions (See Section 3.11). The responses of the operators were aggregated and average responses were calculated. The results in this Section include the results of the test survey, except where specifically noted otherwise, since only one of the questions from the test survey changed when creating the final survey.

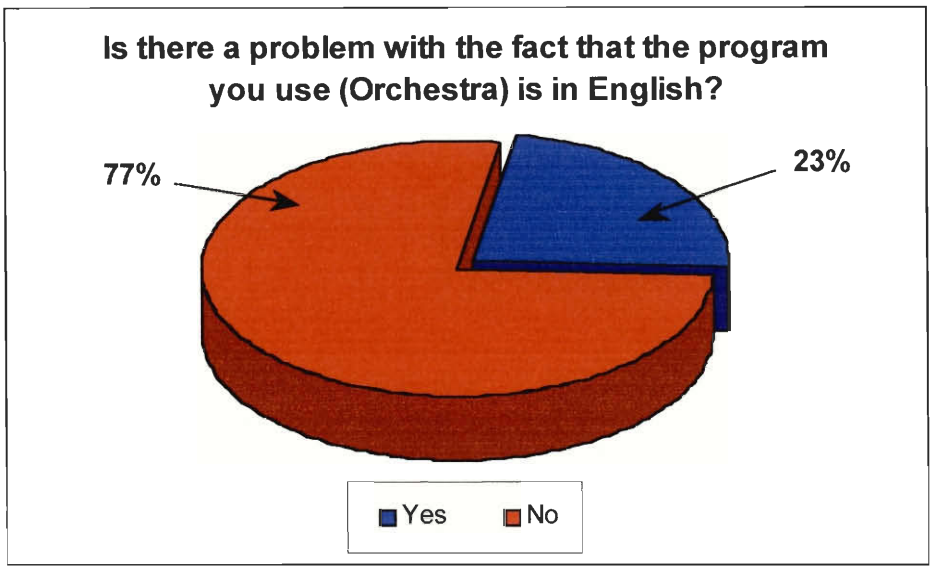

Figure 4.1 Language Barrier Question (Operator Survey)

The first question that the students analyzed asked the operators whether they perceive a problem with the fact that the program they use everyday (Orchestra) is in English. Only one of the 75 operators surveyed did not answer this question. The results displayed in Figure 4.1, above, show the percentages of the remaining 74 responses. At first it appears that a large majority of the operators do not have a problem with Orchestra being in English. This is indeed true; however, it was the number of operators who were concerned with this problem that was most important to the students. Almost all of the operators speak solely Spanish, and so having to use a program where the menus and fields are in English can certainly cause a bothersome language-barrier. The fact that nearly a quarter of the operators surveyed had this problem with Orchestra being in English speaks to the fact that this was an issue that needed to be addressed immediately. Recommendations regarding this subject can be found in Section 5.1.

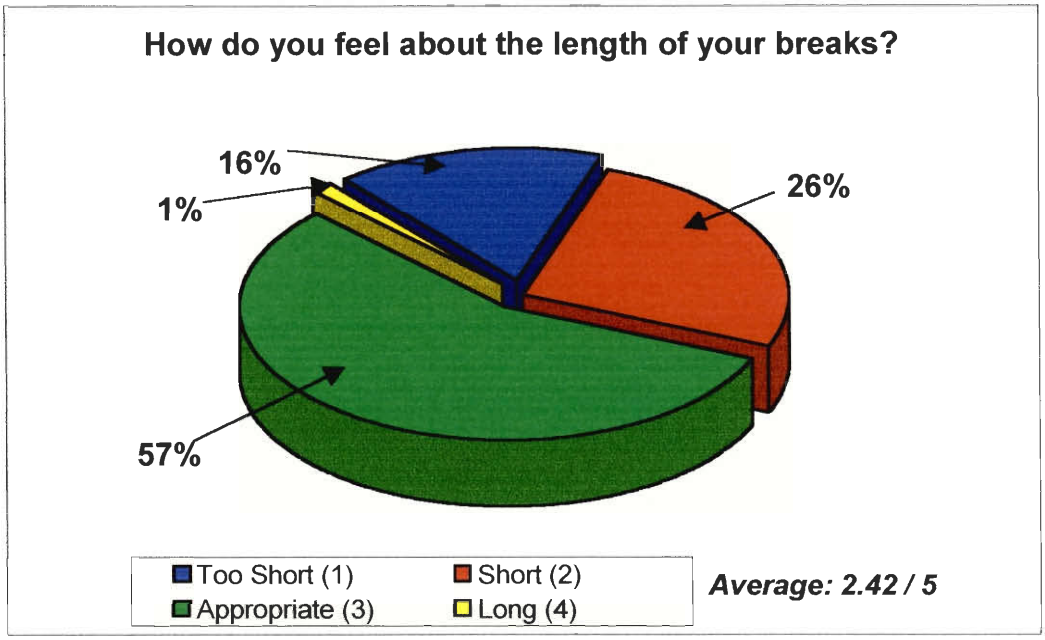

Figure 4.2 Length of Breaks Question (Operator Survey)

An important aspect that the project team expected to better understand from this survey is whether the operators feel that they are being treated in a fair manner. The operators' jobs are monotonous and sedentary, so their breaks are an important time for them to relax. The team hoped to understand what the operators felt about the length and frequency of these breaks. Only two of the 75 operators surveyed did not respond to this question. From Figure 4.2, above, it can be seen that over half of the operators feel that the length of their breaks is "appropriate." However, over 40% of the operators surveyed (shown in red and blue) felt that the breaks should be longer. The average response shown in Figure 4.2 (See Appendix C for possible responses) portrays this same sentiment. A majority of the operators appear satisfied with the length of their breaks, but an only slightly smaller minority feels the breaks should be longer. Recommendations regarding this issue can be found in Section 5.1.

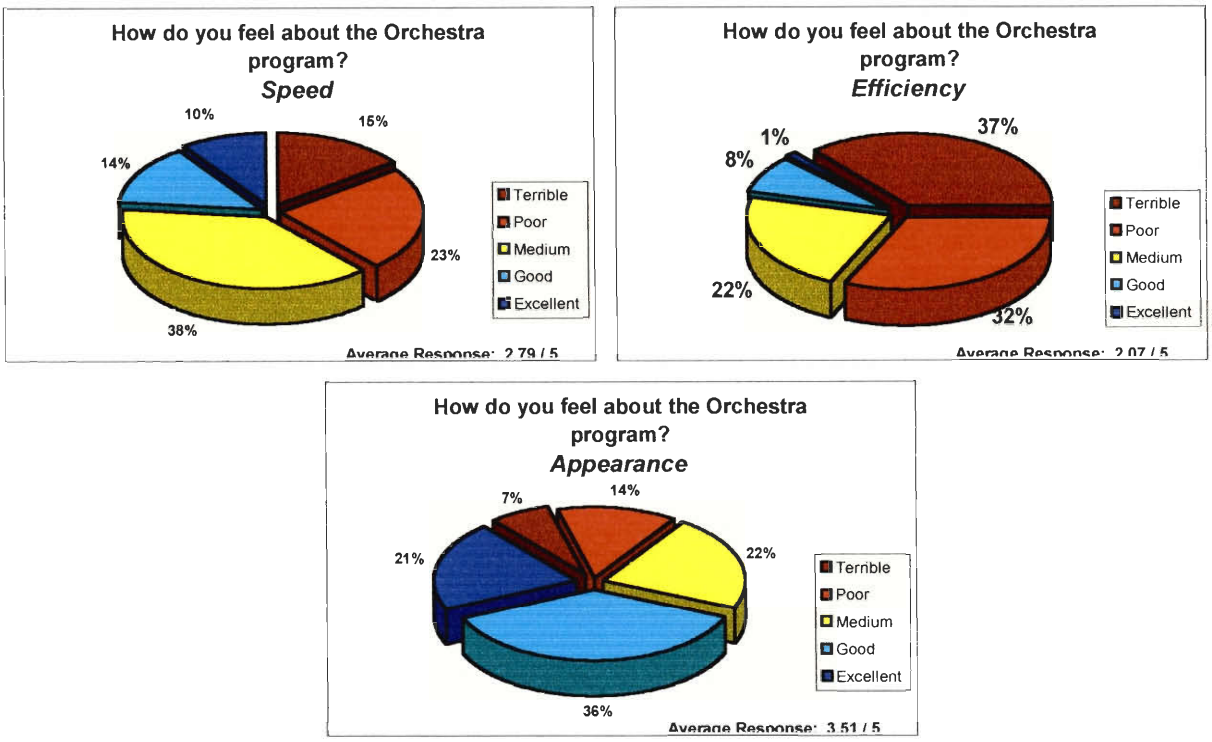

Figure 4.3 Operator Feelings About Orchestra (Operator Survey)

As previously mentioned, the operators working at Information Service 113 use a software program called Orchestra, a database-searching program. Since the operators use the program every day, and since they rely on the program to be able to effectively perform their job, the IQP team felt it was important to understand the operators' feelings regarding Orchestra. This section of the survey was divided into three different questions about the speed, efficiency, and appearance of the Orchestra program. Out of the 75 operators surveyed, 73, 72, and 73 of them answered the three questions, respectively. Their responses can be seen in Figure 4.3, above.

The distribution of answers for the speed question is fairly equal, with the largest number of operators feeling that the program's speed is mediocre. This distribution of answers gave an average response of 2.79, or between "poor" and "average." Since the

operators rely on the speed of Orchestra to quickly carry out searches for the client, this response is meaningful, and deserves to be noted to the company. Recommendations regarding this issue can be found in Section 5.4.

The distribution of answers for the efficiency question is much more skewed, as can be seen in Figure 4.3, on the previous page. 69% of the operators who responded to the question gave responses of "poor" or "terrible." Only 9% of the operators gave responses of "good" or "excellent." This distribution gave an average response of 2.07, or "poor." Because there are a number of technical problems with Orchestra (See Section 2.3132), these responses were not surprising. However, it is extremely important to note that over 90% of the operators surveyed felt that the efficiency of the program they use every day is only mediocre at best. Recommendations regarding this issue can be found in Section 5.4.

The distribution of answers for the appearance question is much more favorable to the program. Over 55% of the operators who responded to the question gave responses of "good" or "excellent," resulting in an average response of 3.51, or between "good" and "medium." The appearance of the program was not as important an issue as its speed or efficiency, but the team understood that it could still affect the opinions of the operators about the program (See Section 2.3132). However, since there is little that can be done to change the appearance of the program, and since the average opinion of the operator was on the positive side of the Likert scale, no recommendations were made to the Service regarding this issue.

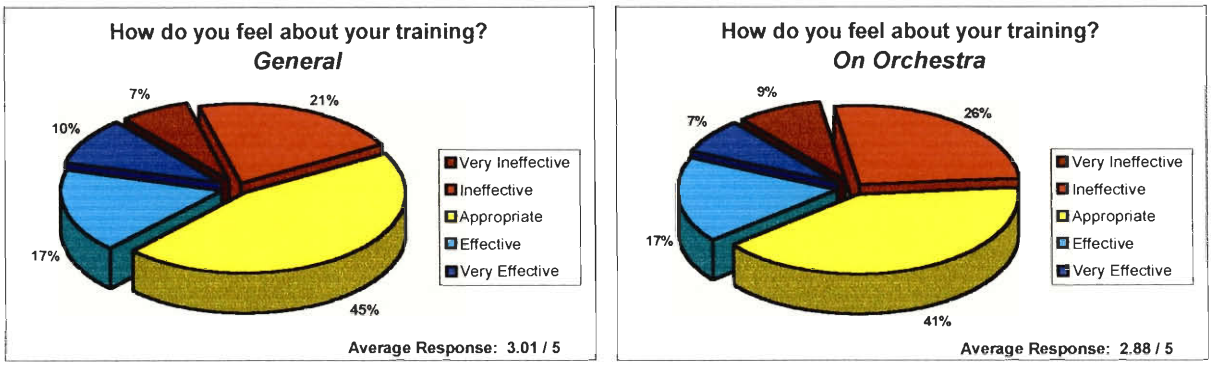

Figure 4.4 Training Questions (Operator Survey)

Training is a very important aspect of an operator's performance. If he or she was trained well, his or her performance will reflect this. In the same manner, if an operator's training is ineffective, this will negatively impact his or her performance. Out of the 75 operators surveyed, 71 responded to the question about their training in general, and 69 responded to the question about training on the Orchestra program.

The distribution of responses for the general training question shows a Bell Curve distribution, with almost half of the operators responding that the training was appropriate. The average response of 3.01, or "appropriate," reflects this trend. This average response is not unexpected, since the Service did not mention any difficulties or problems with the training program to the IQP group, but still shows that the training program can definitely be improved. Recommendations regarding this issue can be found in Section 5.1.

The distribution of responses for the training in Orchestra question is very similar to the previous question, but reflects a lower opinion of this area of training, with the largest number of operators giving responses of "ineffective" and "very ineffective." The

average response of 2.88 echoes this trend. This factor was taken into consideration when the general recommendations for training, mentioned previously, were created.

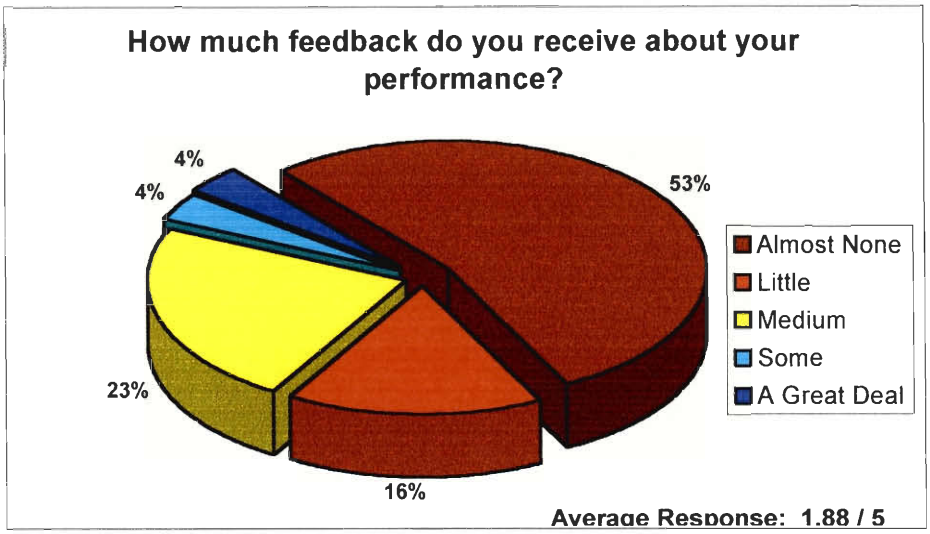

Figure 4.5 Amount of Feedback Received (Operator Survey)

For an operator to fully understand his or her performance, and what is expected of him or her, supervisors must provide the operator with an adequate amount of feedback about his or her performance. The students chose the survey question about feedback to be the final fixed-response question to be evaluated and analyzed. Because this question was ambiguous in the test survey, the responses of those operators who were in the test group were omitted from these results. Therefore, only 56 of 75 responses are reflected in the graph in Figure 4.5, above. However, even with this smaller number of responses, a definite trend can easily be seen. Over 50% of the operators who responded answered that they received almost no feedback at all. The best two responses ("a great deal" and "some") combined only constitute 8% of the responses. From Figure 4.5 it is clear that this is a big problem with the operators, and one that must be dealt with immediately. The average response of 1.88, or between "little" and "almost

none," clearly demonstrates this as well. Recommendations regarding this issue can be found in Section 5.1.

4.12 Open Ended Survey Questions

As can be seen in Appendix C, there were two open-ended questions in the operator's survey, in which the operators are asked to provide suggestions and recommendations about the training they received and general suggestions, respectively. While the responses to these questions could not be compiled as quantitatively as the fixed-response questions, certain responses were given by a number of operators, which could be compiled graphically.

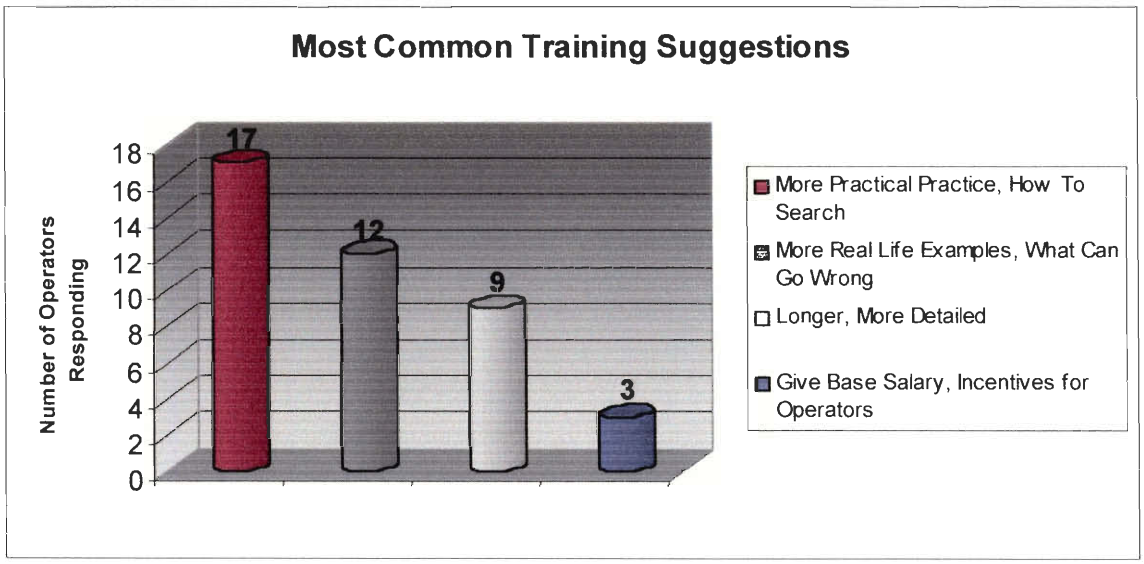

Figure 4.6 Most Common Training Suggestions (Operator Survey)

Because the quality of training that an operator receives can dictate how well he or she performs his or her job, the students felt that it was important to not only understand the operators' feelings about the training they received, but also their suggestions about how to improve their training. Out of the 75 operators surveyed, 54

responded to this question. While this number is somewhat small, it is not surprising since it takes time to respond to open-ended questions, and the operators' time is extremely valuable to them. Out of the many responses given, four specific concerns were noted repeatedly, and can be seen in Figure 4.6, on the previous page. The first three responses in Figure 4.6 dealt mostly with longer training, with more practice, and real-life experience. Only one of the suggestions seen in Figure 4.6 dealt with money. Nine of the operators who responded mentioned a desire to have a base-salary for the first two months of employment, and the rewarding of incentives for good performance. While none of the responses represented more than 35% of the total responses, the project group felt that they were very important suggestions. Recommendations to the Service regarding this issue can be found in Section 5.1.

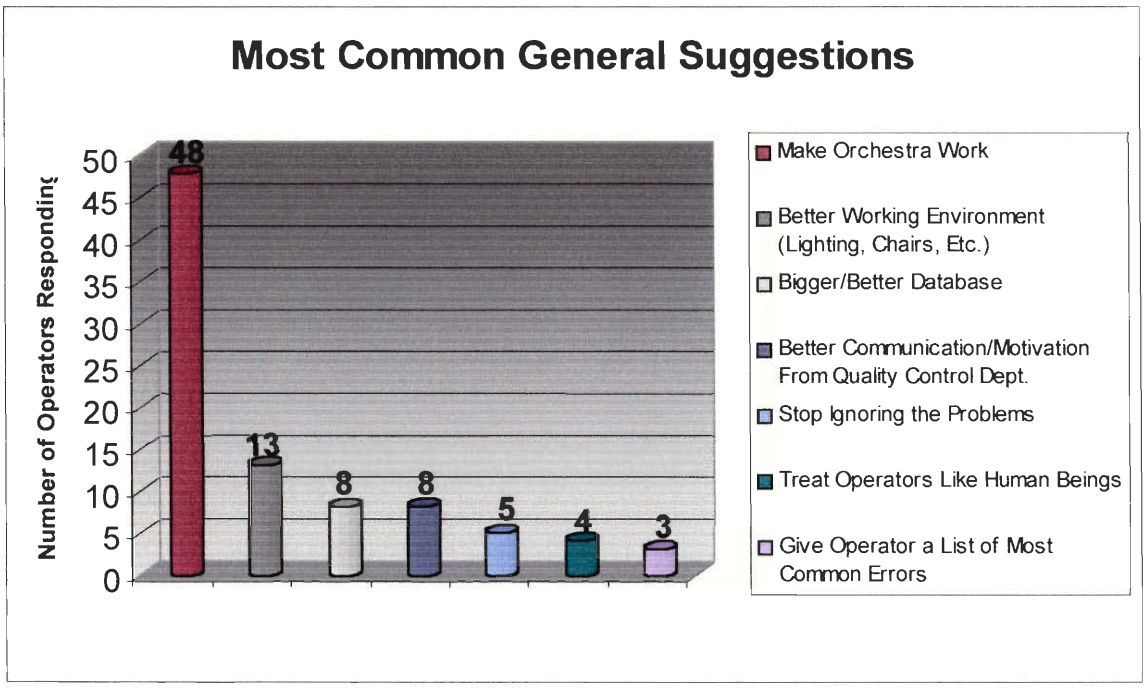

Figure 4.7 Most Common General Suggestions (Operator Survey)

In addition to suggestions about improving the training program, the operators were also asked for any general recommendations or suggestions that they may have had. Of the 75 operators surveyed, 64 responded to this question. The most common responses can be found in Figure 4.7, on the previous page. An overwhelming 75% of the operators who responded to the question requested that the Automatic Responding Unit of the Orchestra program be fixed. There is currently a problem with the part of the program that automatically reads the number that the operator chooses to the client (See Section 2.3132). The IQP team, as well as Information Service 113, was well aware of this problem, and so having a high number of operators give this response was not surprising. However, having 75% of the operators specifically point out this problem shows how negatively the operators feel about it. A number of operators mentioned that the problem was hindering them from correctly carrying out their jobs.

The remainder of the most common responses are fairly standard suggestions, such as improving the physical working conditions of the operators, and updating and improving the equipment. Nonetheless, two of the suggestions stood out: responses of "stop ignoring the problems" and "treat the operators like human beings" indicated serious issues that require immediate attention. If the operators feel as if they are being taken for granted or being ignored, they will likely feel little motivation to excel. The group felt that the operators' impression about their importance to the Service and to the supervisors is extremely important. Recommendations written to this effect, along with other recommendations related to this survey question, can be found in Section 5.1.

4.2 Operator Ratings

Once a class system for the operators working at Information Service 113 was defined, and 121 out of 150 of the operators had been placed into the classes (See Section 3.23), the team was able to analyze the distribution of this class system. The full list of operators, their respective grades and class designations can be found in Appendix F.

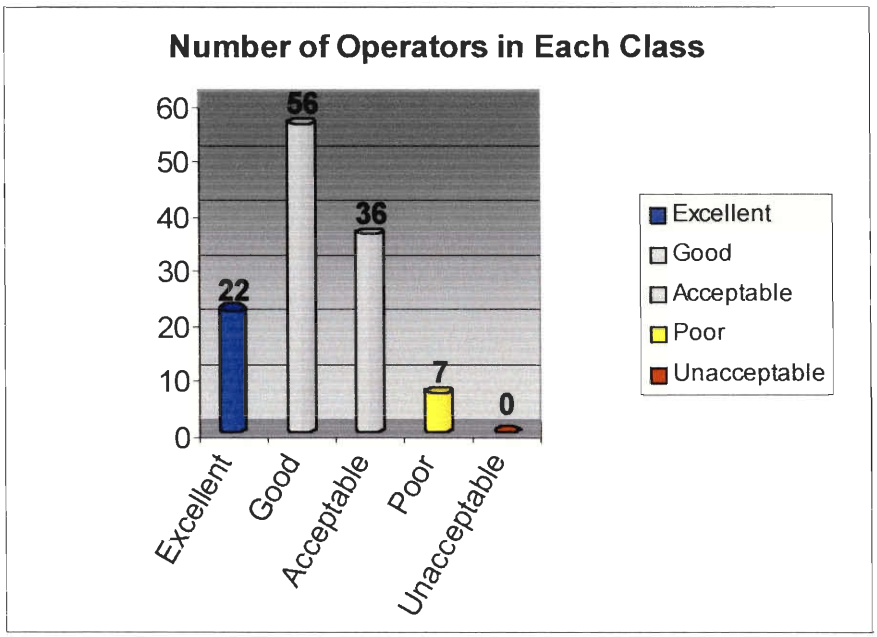

Figure 4.8 Number of Operators in Each Class

As can be seen from Figure 4.8, above, the distribution of operators in the class system follows a curve similar to a Bell-Curve distribution system. The majority of the operators, 46%, fell under the category of "good" performance. In addition to this, 22 operators reached the elite level of "excellent" performance, meaning they committed no errors that month. This number was surprisingly high, and definitely very encouraging. From this distribution, the "excellent" level of performance appears to certainly be an attainable goal for all of the operators at Information Service 113. None of the operators feel into the "unacceptable" level of performance, but seven of them performed below the

expected level, which was designated by the "poor" level of performance. Recommendations regarding possible measures for operators in the lower two levels, as well as possible incentives for operators in the higher level, can be found in Section 5.2.

High, Low, and Average Performance of the Operators		
	Performance 'Grade'	**Class Designation**
Low	95.7 %	D
High	100 %	A
Average	99.37 %	C

Table 4.1 High, Low, and Average Performance of Operators

The average performance percentage of the operators was 99.37%, which falls under the "acceptable" level of performance, just below the cutoff for "good" performance. By this system of grading and classification, the operators at Information Service 113 do not appear to be performing poorly, but by raising expectations additional room for improvement is created. It was the belief of the project team that this distribution can show the operators that improvement is definitely attainable, and that their work in reaching this improvement will not go unnoticed by the Service.

4.3 Service Rating

The next information analyzed by the project team was the data about the overall performance rating of Information Service 113. The rating is based on the number of correctly answered calls each month, as defined in Section 3.3. For this purpose, the data was separated into various sections. The full list of data for the overall Service rating can be found in Appendix G. However, the first area of data in this Section is the individual monthly ratings and overall yearly rating for 1999, which can be seen in Table 4.2, on the following page.

Monthly and Overall Data for 1999 Service Grade				
	Received Calls	**Calls Answered Correctly**	**Percentage of Calls Answered Correctly**	**Service Grade**
Jan - 99	1,856,695	1,660,186	89.42 %	**3**
Feb - 99	1,771,338	1,605,565	90.64 %	**2**
Mar - 99	1,981,052	1,784,266	90.07 %	**2**
Apr - 99	1,887,723	1,698,814	89.89 %	**3**
May - 99	1,943,941	1,721,710	88.57 %	**3**
Jun - 99	2,376,791	1,792,832	75.43 %	**4**
Jul - 99	2,377,677	1,992,890	83.82 %	**4**
Aug - 99	2,389,243	2,199,563	92.06 %	**2**
Sep - 99	1,021,140	923,314	90.42 %	**2**
Oct - 99	2,516,921	2,259,902	89.79 %	**3**
Nov - 99	2,602,579	2,382,086	91.53 %	**2**
Dec - 99	2,777,194	2,531,575	91.16 %	**2**
TOTAL	25,502,294	22,550,703	88.43 %	**3**

Table 4.2 Monthly and Overall Data for 1999 Service Grade

The overall yearly grade for the Service for 1999 is a 3, denoting an "acceptable" level of performance. As can be seen from Table 4.2, above, and Figure 4.9, below, the Service grade dropped to a 4, denoting "poor" performance, during the months of June and July. Although the Service was not performing at a poor level overall, its performance can definitely be improved. Operating at a level of 2, denoting "good" performance, or better should be the goal of the Service at all times. Recommendations regarding this sentiment can be found in Section 5.2.

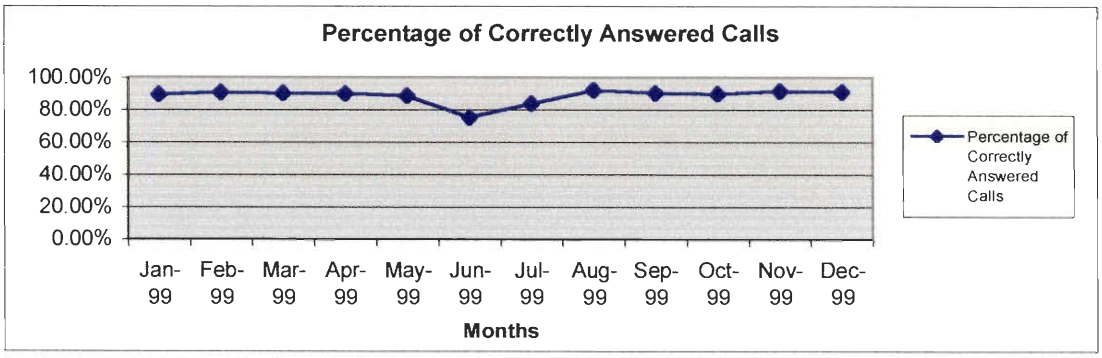

Figure 4.9 Percentage of Correctly Answered Calls in 1999

The second section of data is the individual monthly and overall yearly rating for 2000, through May, which can be seen in Table 4.3, below.

Monthly and Overall Data for 2000 Service Grade				
	Received Calls	**Calls Answered Correctly**	**Percentage of Calls Answered Correctly**	**Service Grade**
Jan - 00	2,851,967	2,547,842	89.34 %	**3**
Feb - 00	2,648,937	2,367,976	89.39 %	**3**
Mar - 00	2,891,590	2,590,676	89.59 %	**3**
Apr - 00	2,611,382	2,134,789	81.75 %	**4**
May - 00	2,905,331	2,568,003	88.39 %	**3**
TOTAL	13,909,207	12,209,206	87.78 %	**3**

Table 4.3 Monthly and Overall Data for 2000 Service Grade

The overall yearly grade for the Service for 2000 thus far is a 3, denoting an "acceptable" level of performance. As can be seen from Table 4.3, above and Figure 4.10, below, the Service grade dropped to a 4, denoting "poor" performance, during the month of April. Although the Service was not performing at a "poor" level on average, the performance of the Service could definitely improve. During the year of 2000, the Service has yet to perform at a level of 2, signifying "good" performance, or above. Since the Service should always strive for at least "good" performance at all times, the need for improvement is apparent. Recommendations regarding this sentiment can be found in Section 5.2.

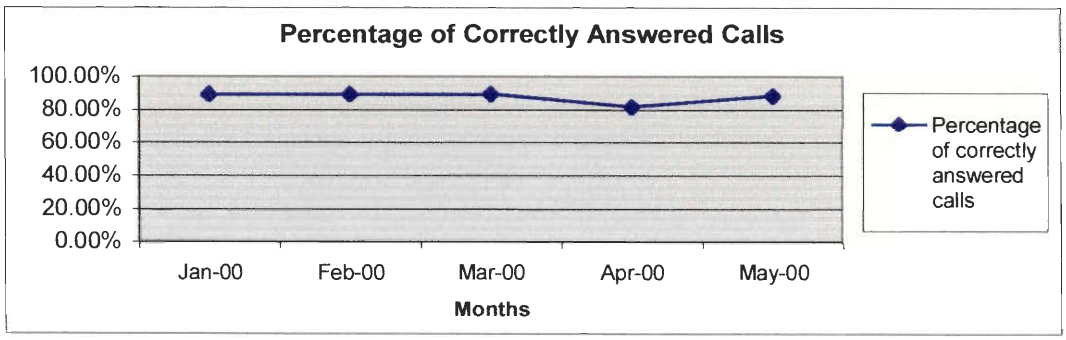

Figure 4.10 Percentage of Correctly Answered Calls in 2000

In addition to the data for individual years, it is important for the Service to be able to compare its performance from year to year and month to month. By comparing the totals from Tables 4.2 and 4.3, on pages 56 and 57, as well as Figure 4.11, below, the trend in performance between 1999 and 2000 (thus far) can be seen.

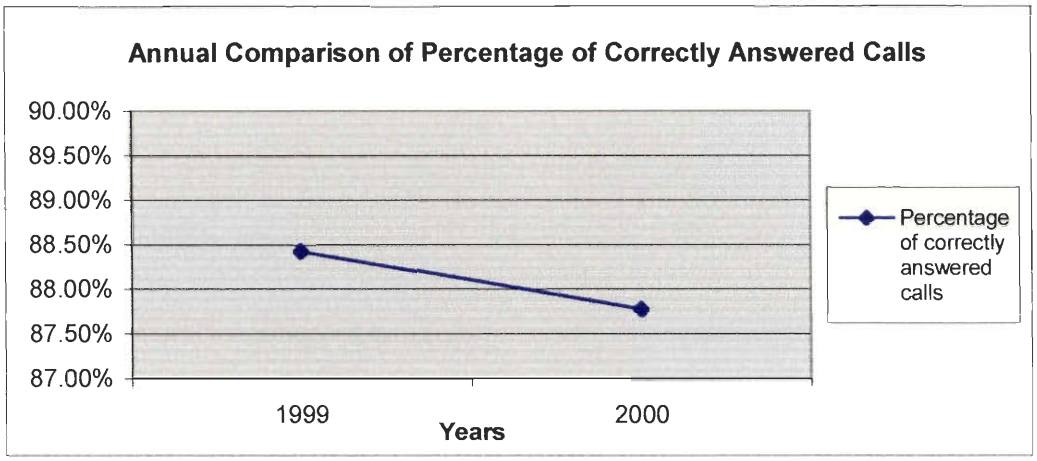

Figure 4.11 Annual Comparison of Percentage of Correctly Answered Calls

Although the percentage of correctly answered calls for 1999 and 2000 are within one percent of each other, there is still an apparent downward trend in the Service's overall performance. While it is not a drastic decline by any means, it is still important to note that the performance is not improving over time. It must be taken into consideration that while Figure 4.11 represents 1999 in its entirety, the overall result for 2000 only represents the months of January through May. Because less than half of the year 2000 is represented, the results shown in Figure 4.11 cannot be solely considered when comparing the Service's annual performance. Rather, Figure 4.12, on the following page, provides a more accurate comparison, only using the months of January through May of both years:

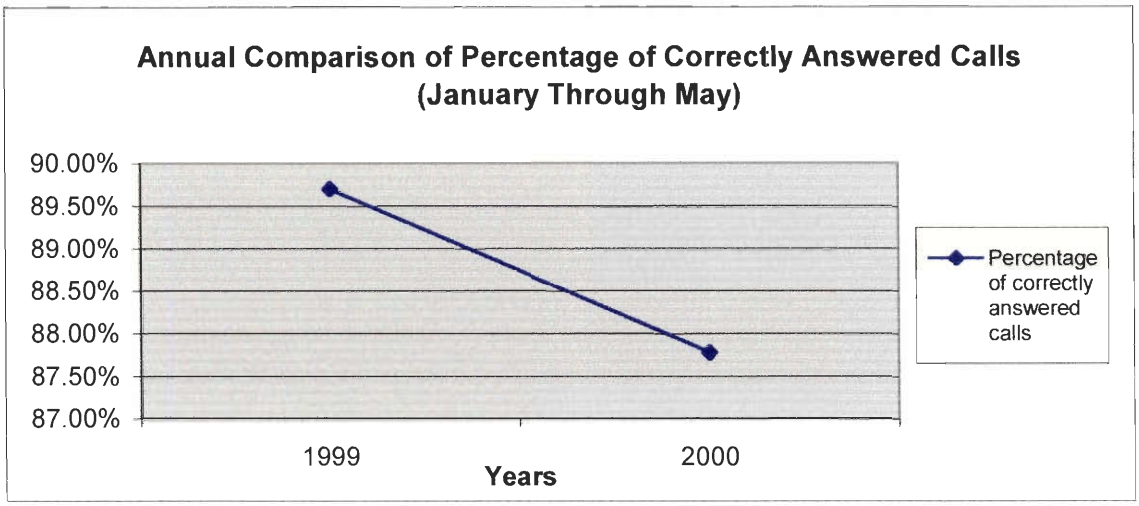

Figure 4.12 Annual Comparison of Service Performance (January Through May)

When comparing only the months of January through May of each year, since the results of the remaining months in 2000 have not been calculated, it becomes apparent that the decline in performance is somewhat more severe than it appeared in Figure 4.11, on the previous page. The difference between the overall performances of the two years is now just under two percent. It is important that the Service is aware of this decline, and makes every effort to improve its performance in the future. Recommendations regarding this issue can be found in Section 5.2.

It is also important to compare the results of individual months, in order to see trends in performances. The comparisons between the performance of the Service during the months of January through May of 1999 and 2000 can be found in Appendix G. From these results, it can be seen that for each of the five months, the performance of the Service declined to some degree from 1999 to 2000, most notably decreasing over eight percent and lowering from "good" to "poor" performance between April 1999 and April 2000.

From the analysis of the data presented in this Chapter, the students were able to draw conclusions about the results, and make recommendations about some of the information gleaned from the data and comparisons. These conclusions, as well as the recommendations created as a result of them, are an integral part of the complete comprehension of the data presented in this Chapter. These, as well as the other general conclusions and recommendations of the project, are found in the following Chapter.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

While the data presentation and analysis found in Chapter 4 is both important and relevant to Information Service 113, it is only the first step to a successful project. Creating conclusions from the data gathered, and creating recommendations for the future, are integral parts of this project, especially considering that the results of the project could continue to be used well after the departure of the IQP team from Costa Rica. Therefore, included in this Chapter are the conclusions and recommendations created by the team. Because the employees of Information Service 113 speak solely Spanish, this Chapter in its entirety can also be found in Spanish in Appendix N.

5.1 Operator Survey

It is the impression of the team of students that the operators who work at Information Service 113 have little opportunity to voice their complaints and suggestions collectively. The results of the operator survey (See Section 3.11) spoke to this end. A number of the operators wrote full pages of suggestions and comments, and most of the operators took the questions as a serious opportunity to make their voices heard. From the results of the survey (See Section 4.1), the project group concluded that the operators at Information Service 113 are dissatisfied with a number of aspects of their jobs. As mentioned in Section 4.1, a number of the issues indicated in the responses to the survey are very significant to the operators. By attempting to improve the overall working conditions of the operators and resolve some of the issues that the operators had, the

project team believed that the overall performance of the operators would also be improved. The group developed a number of recommendations to this end.

The first set of recommendations is relevant to the training that the operators receive from Information Service 113, upon beginning their employment at the Service. The currently training program was developed in 1996 but has never been updated; therefore, the team understood that a few modifications were necessary in order to make the program more effective. Through the survey, the operators proposed a number of suggestions about possible improvements to the training, indicating that there are some definite problems with the training program. From these suggestions, the team recommends that Information Service 113 increase the duration of its training program.

The current training program is fifteen days long, lasting three hours each day. Only five of these days are devoted to practice with the Orchestra program. The training should still last fifteen days; however, the number of hours each day devoted to the training should be increased from three to four. Within this longer training period, the Service should also include more practice with the database, giving the operators real-life experience with the system so that they will know what errors can possibly occur and how to correct them.

The topics for the individual days of the training program should follow the format described below:

Day One: Topics should include an introduction to the facilities and staff at Information Service 113. Chapters one, two, and three of the Service's training manual, described on page 64, should be covered during this day of the training program.

Day Two: Topics should include how to treat the clients, how to maintain quality service, why and how the operators are evaluated, an introduction to the Orchestra program, how to use the macro keys on the operator keyboards, and how to search for information in the database. Chapters four, five, six, and seven of the training manual should be covered. At this point, the operators should have access to the Orchestra program in the training room.

Day Three: Topics should include practice with the keyboard and how to search for information in the database. Chapters eight and nine in the training manual should also be covered.

Day Four: Operators should be given an exam to check their understanding of the keyboard, and to determine which areas of the training program need to be clarified. The emergency key on the keyboard should be explained at this time.

Day Five: Topics should include how to search for frequently solicited and public telephone numbers. Chapter twelve about Costa Rican geography should have already been covered by this point in the training program.

Day Six: Topics should include how to put clients on standby, how to solicit help from supervisors, and how to transfer calls and handle non-Spanish speaking clients. A second exam should be administered to evaluate the operators' knowledge at this point.

Day Seven: Operators should be placed in the Operators Room to observe how the Service works. Chapters ten and eleven should have been covered by this time.

Day Eight: The operators should practice receiving incoming calls with the assistance of a more experienced operator. At the end of the day operators should be given the opportunity to give any comments or ask questions.

Day Nine: A final exam should be administered to the operators, and the operators should be given the opportunity to have any remaining questions answered.

The remaining days of the training program should be devoted to practice. During these days, the operators in training should always be assisted by a more experienced operator. During the entire training program, a computer should be placed in the training room that will allow the operators to practice with the system as they learn.

The new training manual should consist of twelve chapters:

1) "History of ICE"
2) "The National Telecommunications System"
3) "History of Information Service 113"
4) "Appropriate Manners" (how to behave)
5) "Evaluation System" (A list of possible errors should be included)
6) "Definition of the System Configuration"
7) "Search-engines Within the Program"
8) "Definition of the Keyboards" (Should include emergency key)

9) "Searching methods"

10) "How to get started"

11) "Training Material" (Should include: National numbers, abbreviations, updated list of synonyms, how to use keywords, multiple names for locations, updated list of different spellings of company names, Public hospitals, public Clinics, updated list of governmental agencies, rural phone program, and F.C.N.L. archive)

12) "Costa Rican Geography"

While the Service will need to dedicate more time and resources to implement a longer, more detailed training program, it is the belief of the project group that the benefits of this change will far outweigh the costs. With better training, the performance of the operators will most likely improve, decreasing the possibility of the need for future re-training. By improving the training program for the operators, the overall performance of the Service will also most likely improve, as a result of the improved performance of its operators.

The next set of recommendations involves the physical working conditions of the operators. A number of the operators had definite problems with their physical working environment, as was indicated by their responses in the survey. Two of the recommendations are very easy to implement, and were mentioned as suggestions by over 20% of the operators surveyed. The operators mentioned dissatisfaction with the chairs that they have in the Operator's Room. Although the group members tested the chairs themselves and noticed that the chairs were ergonomically structured and fairly comfortable, the operators sit in the chairs for hours at a time. The IQP team

recommends that Information Service 113 investigate the possibility of purchasing new chairs for the Operator's Room.

Adjustable chairs would help alleviate some of the discomfort of a remaining in the same place for an entire shift, and improved cushioning would eliminate some of the soreness associated with a completely sedentary job. Because of the difficulty in administering the operator survey and the anonymity of the responses, the project group was unable to determine which type of chair would be more comfortable for the operators. However, the Service could accomplish this fairly easily by posting a suggestion sheet on the operators' bulletin board specifically concentrating on this issue. By further investigating the issue, the Service will be able to determine a solution that will be satisfactory to the operators.

In addition to the chairs in the Operators Room, a number of operators complained about the illumination in the Room, indicating that it became difficult to see at night. Because the Service operates 24 hours a day, it is very important for the operators working at night to be able to see without the aid of sunlight. To this end, the group recommends that Information Service 113 look into improved lighting for the Operator's Room. Brighter ceiling lights would help to alleviate the general problem. Because the operators' performance can be affected to some degree by their comfort, the Service should hire a professional to evaluate the room's present illumination and make improvements to the ceiling lights. The Service should also purchase individual desk lamps for each of the 72 workstations would allow each operator to adjust the brightness of his station to his or her own needs. The additional purchase of glare-resistant screens

that attach to computer monitors would help alleviate the strain on the operators' eyes due to poor lighting and watching a computer screen then entire time they are working.

In addition to their physical working conditions, many of the operators also mentioned a problem with the length and frequency of their breaks, as stated in Section 4.11. A recommendation about the duration of the breaks could not simply be created. By increasing the lengths of the operators' breaks, the Service would be taking away from the time that they work, thereby decreasing the operators' pay. Making a general recommendation to increase the length of the breaks would be inappropriate, since there were many operators who felt that the length of the breaks was appropriate. Again due to the difficulty of administering a survey to all of the operators, it was difficult to further investigate this issue. As a general recommendation, the Service should not change the duration or frequency of the breaks until the topic can be further explored. There are a number of necessary steps before the Service can change the breaks.

First, the operators need to be made aware of the specifics of the issue. This can be accomplished with a memorandum stating the concerns regarding changing the breaks, described above, which can be posted on the operators' bulletin board. The memorandum should detail possible changes that could be made, including combining two 15-minute breaks into one 30-minute break, or simply adding additional breaks during the course of the operators' shifts. A suggestion box should then be placed outside of the Operators Room concerning the issue. If enough operators mention the need for a particular modification to the breaks, then said modification should be made. However, if the majority of the operators do not agree on any particular alteration, no changes should be made.

The next set of recommendations deals with the interactions between the operators and the Quality Control and Administrative staffs of Information Service 113. Many of the operators mentioned a lack of communication between the Quality Control Department and the operators. According to the research of this project, the lack of communication exists in two areas. To this end, the team created two recommendations for the Quality Control Department.

The first recommendation is that the Quality Control Department provides the operators with better feedback about their performance. The operators currently receive weekly reports about the errors they make, which they can contest before the final weekly errors reports are created. However, personal communication with the operators is necessary, in addition to the written reports. Instead of merely listing the errors made each week by the operators, their performance should be commented on. If an operator performs well during a particular week, perhaps committing no errors, they should be commended, either in the report or verbally. If an operator commits a larger number of errors during a particular week, they should be motivated to improve, again in either a verbal or written manner. It is not as much the frequency of the feedback as its quality that must be improved. By discussing with the operators their performance, the Quality Control Department will be able to have a better understanding of the reasons behind the operators' performance, and the operators will have a better idea about the supervisors' perceptions about their work.

The second recommendation involves the operators' perceptions about their importance to the company and how the Service views them. Many of the operators expressed the idea that they are viewed more as "tools" of the Service rather than as

people. This sentiment, whether it is based on fact or only on perceptions, certainly can affect the performance of the operators. The operators need reassurances that the Information Service 113 staff views them as equals, and that their concerns are not being ignored. The team recommends that the Service create a monthly company newsletter, which will be distributed to both the operators and the Service's staff. The newsletter should report any major news about the Service and ICE, and describe all changes being made to the Service and the reasons for these changes. Such a newsletter could also be an excellent location to list the names of the operators who perform extremely well during the course of each month, as is described in the following Sections.

5.2 Rating Systems

In order to interpret the meaning of each level of operator and Service rating, the team created recommendations about each of the levels. The first set of recommendations is about the operator rating system. The following are the recommendations for each of the five levels of operators:

A – Operators who reach the level of "excellence" should be rewarded for their hard work and dedication to quality performance. Operators who reach this level for the first time should have their names displayed prominently, either on a bulletin board, on the scrolling marquis in the operator's room, or in the company newsletter described in the previous section. For operators who reach this level of performance multiple months in a row, the Service should provide them with a monetary bonus, the size of which would be at the discretion of the administration.

B – When they reach a level of "good" performance, the operators should not remain content about their performance. Rather, they should strive to reach the next level of performance. To this end, the Service should give the operators both written and verbal motivation to improve their performance. Their good performance should also be rewarded, however, and so the operator's name should be highlight along with the names of the "excellent" operators on the list of operator ratings described on page 71.

C – Since performance in this level is "acceptable", but not desirable, the operators performing in this level should receive written and verbal motivation from the Quality Control Department to improve their performance.

D – Operators who are performing "poorly" should first be warned about their performance. This warning should not be a threat, but rather an important notice to the operator that there is a need for improvement. If an operator remains in this level of performance for multiple months, a mandatory meeting should be scheduled with the Quality Control Department to find out why the operator is performing poorly. Depending on the reasons for their performance (whether personal or professional), necessary actions, such as re-training, should be taken.

E – Operators should never reach this level of performance. If the level is reached, a mandatory meeting should be scheduled immediately to discuss the reasons. From this meeting, definite actions or changes should be taken to improve the operator's performance immediately. If an operator remains

in this level for more than one month, dismissal should definitely be considered.

Each month the list of operator ratings should be posted near the Operators Room so that each operator can see how well they are performing. The names of the operators who achieve "excellent" or "good" performance should have their names emphasized on the list, perhaps with a star next to their names. The list would provide extra motivation for the operators to excel.

The following are recommendations for each of the five levels of performance of the Service:

1 – At this level, the Service is performing where it should be. No changes are necessary, but the Service should not remain satisfied and should strive to repeat its performance.

2 – Although this level indicates good performance by the Service, the Service should try to determine why it is not performing in level one. Depending on whether the Service is performing at level two due to lower performance by the operators or because it received a large number of calls that were unanswered, changes could be made to improve the performance.

3 – The Service should again try to find out why it is performing at this level rather than at a level of excellence, and make changes accordingly to improve the performance.

4 – At this level of performance, a definite problem exists with the Service. Either the operators are dissatisfied with some area of the Service, or something is wrong with the Service itself. If it is the operators, the Service

needs to address their concerns immediately. If it is the Service, the errors need to be addressed, and necessary changes made.

5 – Something is drastically wrong with the Service. The areas that need improvement should be apparent, and need to be addressed immediately. Immediate changes to the Service are necessary, the nature of which the problem areas of the Service at the time will determine.

The current performance rating of Information Service 113 (Refer to Section 4.3) indicates acceptable, but not good, performance. The IQP team recommends that the Service strives to improve its rating, using the recommendations found in each Section of this Chapter.

5.3 Recommendations for Supervisors

From discussions with the supervisors working in the Quality Control Department, the IQP group became aware of a number of issues with the working conditions of the supervisors and the working environment of the Quality Control office. The group developed a number of recommendations, which address these issues. First, the Quality Control Office is very small, with a large number of supervisors working therein. The cramped quarters make it difficult and uncomfortable to work. Because increased comfort can often be indirectly associated with improved performance, the group recommends that individual cubicles be installed in the office (whether in the current office or a new room if the office is moved), to allow greater privacy and comfort for the supervisors. Along the same lines, the group recommends that one cubicle is reserved solely for those times when operators wish to review the recordings of their

performance. Reserving one cubicle for only this reason will remove the need to find a free computer when the situation arises.

The service's current procedures require that the supervisors create all reports and evaluations manually, by hand. This takes a large amount of the supervisors' time, and is a very tedious way of performing their jobs. In order to remedy the situation, the team recommends that the supervisors utilize the evaluation program created in this project (Refer to Section 3.4). The program will eliminate the need for hand-written reports and evaluations, and improve the overall speed and efficiency at which the supervisors are able to perform their duties.

5.4 General Recommendations

Along with the recommendations described in the previous Sections, the group also developed a number of recommendations that did not fit into any specific category. The first two of these recommendations deal with the computer programs that are used at the Service. The most important of these recommendations deals with the Automatic Responding Unit (ARU), the part of the Orchestra program that automatically reads the selected telephone number to the client (Refer to Section 2.3132). The team recommends that the Service immediately focus its efforts on correcting this problem. Although the Service is already making efforts to this end, the problem is still in existence, and needs to be addressed immediately. The problem is affecting the performance of not only the operators, but of the entire Service, and needs to be corrected at the latest by January 2001. This time frame gives the Service enough time to utilize outside help if necessary, or if the necessary corrections cannot be made, look into other available programs.

In addition to the problem with the ARU, the Service also has a problem with the programs they use being in English. The IQP group attempted to contact E-Talk Corporation, the company who makes the software used by the Service, to gather information about this problem, but did not receive a response. The group recommends that the Service contact E-Talk and request information about the possibility of a Spanish version of the programs. Although it is possible that such a solution does not currently exist, the Service could, at the least, suggest the future creation of the solution to E-Talk Corporation.

The program for operator evaluation is completed; however, the project team was unable to install it onto Information Service 113's Intranet server. The network configuration was different than what was initially described to the team, and therefore the students were unable to configure the Active Service Pages (See Section 2.3142) properly. The current network configuration consists of multiple computers networked through a single network hub. There is no server on the network that these pages must be installed on. The Service needs to find someone with knowledge of Intranet configuration and Active Server Pages to install the pages properly on the network. If possible, the Service can request this special knowledge from somebody from a future IQP team, such as the training project recommended on the following page.

The final recommendations of the IQP team deal with possible future Interactive Qualifying Projects with Worcester Polytechnic Institute. The first of these involves the training program that the operators go through. Although some recommendations were developed from the operator survey regarding the training program (Refer to Section 5.1), the group was unable to study the program in depth due to time constraints. However,

the modification and improvement of the training program is necessary, and a fairly large undertaking. To this end, the group recommends that modifications to the training program be developed into a future Interactive Qualifying Project.

The second possible project is the development of a plan to distribute bonuses to the operators of the Service based on their recent performance. By setting a system of rewards based on each operator's performance, each operator would be motivated to constantly improve his or her own performance. Each of these projects would provide a valuable service to Information Service 113, and would satisfy the requirements of an Interactive Qualifying Project with Worcester Polytechnic Institute.

5.5 Final Conclusions

Information Service 113 currently faces a number of problems, many of which were addressed in this project and paper. The project group made a number of recommendations to the Service, including improved working conditions for its employees, the resolution of the technical problems with its equipment, improved communication within the Service, possible actions associated with each level of the operator and Service rating systems developed in this project, and possible ideas for future Interactive Qualifying Projects with Information Service 113. Although these recommendations will improve the performance and satisfaction of both the operators working at the Service and the Service itself, these improvements can only be achieved through the hard work of the operators and the administrative and Quality Control staffs of the Service. The current performance of the Service and its operators, described in this

report, dictate a definite need for improvement, and it is the hope of the IQP team that the solutions developed through this project will begin the process of improvements.

The implementation of the recommendations provided by the team should improve the working conditions and performance of both the operators and supervisors of Information Service 113. Through these improvements, the overall performance of the Service will be enhanced. However, although these improvements will complete the overall goals of this project, defined in this report, it is the additional aspect of the project described below that qualifies it an Interactive Qualifying Project.

An Interactive Qualifying Project blends the two areas of technology and society to enable students to understand how their future careers will affect the society of which they are a part. Through the improvements to Information Service 113 that were developed in this project, the Costa Rican population as a whole will be benefited.

Because it is the client, not the Service, that is most affected by improvements to the quality of service provided by Information Service 113, it is the Costa Rican public who will ultimately benefit from the results of this project. It is this aspect of the project, rather than simply the solutions developed from it, which demonstrated to this IQP team how, through their future careers, the group members will be able to positively affect their society.

APPENDIX A MISSION AND ORGANIZATION OF INFORMATION SERVICE 113

The *Instituto Costarricense de Electricidad* [I.C.E.] is a government-run agency, which controls the electric, telephone, and power systems for Costa Rica. The I.C.E. Corporation is divided into four sub-companies, *ICE Electricity* [ICEELEC], *Radiográfica Costarricense* [RACSA], the *Compañía Nacional de Fuerza y Luz* [CNFL], and *ICE Telecommunications* [ICETEL]. Since 1963, the I.C.E. has had the responsibility of providing quality telecommunication services to Costa Rica.

ICETEL offers a number of Information Services, which the public can use to voice comments and complaints to the company and to solicit information. Information Service 113 is a telephone number solicitation service, which clients can use to request residential, commercial, government, and public telephone numbers.

The Information Service 113 department receives 2.6 millions phone calls per month, and is active twenty-four hours a day, 365 days a year. The 150 operators currently working at Information Service 113 alternate in fifteen shifts. There are 72 stations at the Service, which are all utilized during the times when the most calls are received.

The mission of ICETEL, according to the company's web site, is "[t]o satisfy the necessities and evolutionary expectations of the clients and the Costa Rican society, by means of the opportune provision of services and applications of quality telecommunications and resource." The company's vision for the future is to be "property of the State, competitive in a world-wide class, [a] leader in the telecommunications and information market, with the best technology and human resource to service the client and the Costa Rican society."

Ultimately, this project provided Information Service 113 with a panoramic view of the Service's current and past performance. This report provided recommendations as to how to improve the Service's performance in the future. This project aimed to provide Information Service 113 with the means and information to more effectively strive towards its goal of providing its clients with the best possible service.

Among the Information Service 113 employees who assisted in the development of this project were:

Katia Arana Puente – Chief of Information Service 113. Ms. Arana Puente coordinates Information Service 113.

Leda López Venegas – Quality Control Coordinator. Ms. López is in charge of the operators' quality of work.

Viqui Castro – Production Coordinator. Ms. Castro is in charge of the financially-based aspects of the Service.

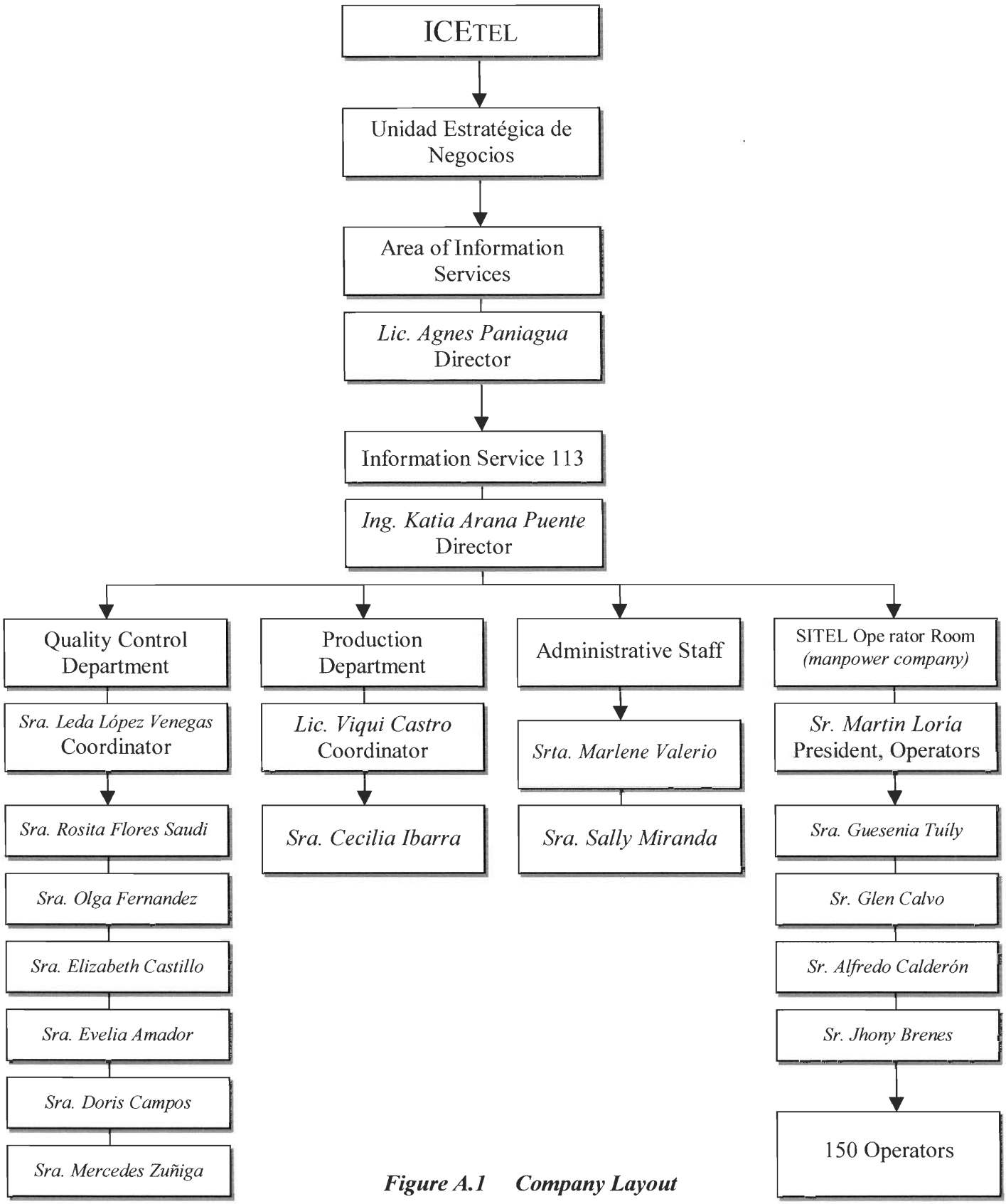

Figure A.1 Company Layout

BELLSOUTH MOBILITY

Reduces Churn 20 Percent with Quality Program

Background

BellSouth Mobility (BMI), a division of BellSouth Cellular, is a leading supplier of wireless communications and cellular telephone service and equipment. BMI's Southeast regional call center handles customer service, help desk and billing inquiries, and employs 100 full-time agents. It is open daily from 7:30 a.m. to 9:30 p.m. and averages 80,000 incoming calls monthly. Seven customer service managers oversee teams of 12 to 15 agents.

Business Issues

"To say the wireless market has gotten competitive is a great understatement," says Bob Furniss, customer service center manager. "As the leading service provider in the Southeast, our customers have become the primary targets of multiple competitors." Reducing "churn," or customer turnover, is priority one for BMI's continued success. To retain customers and build BMI's customer base, the call center focused on several business issues: customizing training and coaching for agents; empowering agents to improve quality; incenting agents to develop their product knowledge and service skills; and building customer loyalty through exceptional value and customer service.

Solution

BMI's strategy focused on targeted, personalized customer service. As a first step, the call center collected and input customer data into its database, so agents can easily access profiles while they have the customer on the phone. Next BMI implemented a call routing function through its ACD. The call center assigned different 800 numbers for various types of calls. Based on the 800 number called, agents can anticipate the caller's needs and provide better service. BMI also began a VIP program, similar to the frequent flyer plans many airlines offer, which entitles these customers to special benefits and discounts. To enhance training and coaching methods and improve quality, BMI automated its quality monitoring process with Teknekron's AutoQuality ® .

"We introduced AutoQuality as a 'voicemail' system that allows you to listen to calls." Before supervisors began monitoring with AutoQuality, BMI encouraged agents to use the system to listen to their own calls. Initially agents even conducted their own reviews. "We found agents were often tougher on themselves than their supervisors were," says Furniss. Now that the system has been fully implemented, supervisors and agents sit down together to review calls, using an evaluation form. As a team they discuss strategies for improvement.

Productivity Increases —
BMI has been able to double the number of monitoring sessions per agent.

Customer Service —
Satisfaction ratings have Increased 28 percent, "churn" has decreased 20 percent.

To combat churn, BMI empowered agents to offer customers incentives to stay with BMI. "Our reps are trained to make decisions on the spot to do whatever it takes to keep that customer happy and reverse a decision to terminate," says Furniss.

As an evaluation mechanism, BMI instituted quarterly satisfaction surveys to evaluate customer service — from the point of sale to their most recent contact. These surveys are used to define goals for the call center. Agents are awarded performance incentives based on their success in achieving individual, team and corporate goals.

Benefits

"AutoQuality has allowed us to make sure we are meeting the expectations of our customers from a service level standpoint," says Furniss. Incorporating the new quality initiatives has enabled BMI to achieve:

- Higher productivity — Overall BMI has doubled the number of monitoring sessions per agent. "The advantage is that we get the right amount of data on every rep without it being a hassle to schedule and record. Reps at different levels can be monitored accordingly," says Furniss.
- More complete monitoring data — Because AutoQuality streamlines the monitoring process, supervisors can complete more feedback sessions per rep. "It used to take two to three hours to review three calls, because we wanted diverse calls that involved problem-solving instead of non-essential calls like an address change," explains Furniss. "Now we can fast forward through unwanted calls."
- Enhanced training/coaching — BMI uses monitoring data to customize training based on which call quality elements are challenging for particular agents.
- Consistent customer loyalty — The new programs have yielded a 20 percent reduction in "churn" and customer satisfaction ratings have increased 28 percent.

Significance

"The official vision statement of BellSouth Mobility (BMI) is to exceed the expectations of every customer and every employee every time," says Furniss. "AutoQuality fits our mission perfectly because it fosters employee empowerment and self-development."

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(E-Talk Corporation, 1999, http://www.e-talk.com/teknekron/pdf/bellsouth.pdf)

GTE

CORPORATE COMMUNICATIONS

AutoQuality ® Helps Improve Education, Agent Empowerment and Performance

Background

With revenues of more than $21 billion in 1996, GTE is one of the largest publicly held telecommunications companies in the world. In the United States, GTE offers local and wireless service in 29 states and long-distance service in all 50 states. GTE was one of the first among its peers to offer "one-stop shopping" for local, long-distance and Internet access services. Outside the United States, where GTE has operated for more than 40 years, the company serves approximately seven million customers. GTE is also a leader in government and defense communications systems and equipment, directories and telecommunications-based information services, and aircraft-passenger telecommunications. Additional information about GTE can be found on the Internet at http://www.gte.com.

Business Issues

"In the telecommunications industry, customer service matters as much as product when it comes to winning and retaining customers," says Steve Neufeld, senior administrator, consumer operations. "To remain a key player in this market, we had to make sure our service was unequaled." GTE faced several challenges as it began building a world class quality program:

- The company needed to gain complete acceptance from GTE's work force regarding monitoring and evaluations.
- GTE's live monitoring program required enhancements. Gathering a representative sample of calls took a long time and meeting monitoring goals was a challenge.
- To help handle call volumes, GTE wanted to cross-train its call centers to handle calls from out of their region. This dynamic capability allowed several call centers to operate as one virtual call center, increasing their efficiency. To put an effective quality program in place, GTE developed performance management processes that promoted agent development, product knowledge and excellent customer service.

Solution

As the first step in pursuing a new quality program, GTE addressed the concerns of its employees and determined that the primary function of monitoring would be for agent development. Establishing these parameters helped put supervisors and agents on the same team for pursuing quality. To enhance the efficiency of their monitoring processes, GTE purchased Teknekron's AutoQuality system. AutoQuality automatically schedules, records and stores monitoring sessions and provides easy play back access from any touch-tone phone. With this new system, GTE has been able to establish and complete ambitious monitoring goals. AutoQuality enables GTE to get a truer representation of the quality service its agents provide.

Productivity Increases —
Monitoring sessions have doubled.

CUSTOMER SERVICE —
Satisfaction up four percent; complaints down 60 percent.

Savings in Travel Costs —
Travel for auditing needs reduced by 10 percent.

To analyze its employees' performance, GTE developed a "contact profile" to be used for agent reviews. The profile set quality benchmarks based on GTE standards for a perfect call. To make sure the rollout of the program was successful, Teknekron trained GTE's resource administrators. GTE's resource administrators then taught AutoQuality technology to its coaches for use with the new processes.

GTE has also developed a quality index that analyzes categories, such as associate empowerment, call lengths and product knowledge. GTE studies how these areas affect each other and which categories have the most impact on customer perceptions. Based on this research, GTE will develop a plan to alter business processes accordingly and incorporate elements into the agent performance profiles as needed.

Benefits

"These quality initiatives have enabled us to view our performance in a more comprehensive way than ever before," says Neufeld. "We can use the infor-mation to change business processes at every level from individual agents to groups to centers — even to a national level." Specific benefits include:

• Higher productivity — With AutoQuality, GTE has doubled the number of monitoring sessions coaches can complete.

• Higher quality scores — The number of customers rating GTE associates as excellent in customer satisfaction has increased by four percent and complaints have decreased 60 percent.

• Effective coaching — GTE uses AutoQuality recordings for side-by-side coaching sessions where reps get a chance to hear themselves. This is a great benefit for quality. "You can tell somebody about tone or inflection or pitch, but they don't get the picture until you play them the recording," says Neufeld. "AutoQuality makes it easier to demonstrate and correct soft skills."

• Enhanced training — GTE uses monitoring data to customize training based on which call quality elements are challenging for particular agents. "Before we were limited to side-by-side monitoring. With AutoQuality, we get a broader more meaningful statistical base," says Neufeld. "Coaches can better identify areas for development."

• Reduced travel costs —GTE has a quality control department that is required to listen to several calls each month. AutoQuality's remote access allows them to listen to calls remotely instead of having to travel to regional call centers.

• Team-oriented progress — Agents are involved in the training process. It's no longer directive, and there's more self-management. Agents discover issues for themselves and take responsibility for improving. Coaches can now partner with associates to recognize successes.

• Empowerment — Agents review themselves using the same contact profile and AutoQuality calls coaches do. "We ask them to highlight areas for improvement," says Neufeld. "Normally they're more critical of themselves and immediately correct problems."

"AutoQuality allows us to review agent soft skills fairly in a manner that has never been available before," says Neufeld. "These items, such as tone and attitude are so important to customers, but are hard to quantify. Now we can evaluate agents' soft skill performance and help them to improve by using recordings."

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(E-Talk Corporation, 1999, http://www.e-talk.com/teknekron/pdf/gte.pdf)

LIGHTBRIDGE, INC.

Wins Clients with High Standards for Service Quality

Background

Lightbridge, Inc., located in Waltham, Mass., specializes in providing wireless telecommunications carriers with innovative solutions for customer acquisition and retention. Solutions offered by Lightbridge include fully automated and integrated qualification and activation services; distribution channel solutions and analysis; subscription fraud screening; churn management applications and services; and a range of business integration and consulting services to help carriers improve their operations and performance. Lightbridge's call center of more than 200 agents takes approximately three million calls annually.

Business Issues

"As the front-door for wireless carriers, outstanding customer service is a competitive necessity," says Rich Deyermond, Lightbridge's director of teleservices. "When wireless carriers are determining who to partner with, we want to make sure they know our service standards are high." To accomplish this, Lightbridge needed a system to track real-time service quality statistics and showcase its quality standards to prospective clients.

Solution

After hearing customer testimonials about Teknekron Infoswitch's AutoQuality ® and P&Q Review ® , a team from Lightbridge took a sight tour at GTE to see the systems in action. Impressed with the efficiency Teknekron's systems could provide, Lightbridge began planning the rollout of an enhanced performance management program based on AutoQuality and P&Q Review.

"We held numerous team meetings and showcase sessions, introducing AutoQuality and P&Q Review as tools for agent development and improved customer service," says Ellie Ward, call center manager. To increase the accuracy and effectiveness of its monitoring program, Lightbridge set up the new systems to provide very quick feedback to agents about their performance. The center's three trainers and six supervisors monitor each agent twice a month, then score the calls and review the information with the agent within 48 hours. Supervisors, trainers, management and agents are kept aware of the scores and how the call center is measuring up against its goals.

"P&Q showed us that some agents were not verifying pieces of data on a consistent basis," says Ward. "The system helped us to focus everyone's attention on that situation, and rectify the problem quickly." In addition, Lightbridge has tied incentives to the evaluations. Annual performance reviews for agents are based on their P&Q Review scores, and the call center has set up bonuses for trainers and supervisors according to team scores.

Quality Increases —
Scores have risen 14 percent.

Productivity Increase —
Scores have risen 7 percent.

"We have a Wall of Fame that displays the score sheets of agents that meet performance goals," says Ward. "Agents love to see their names and scores on the wall — it's been a real morale booster." This Wall of Fame also sends a powerful message to prospective clients regarding Lightbridge's commitment to quality performance. "We give all our prospects a tour of our facilities," says Deyermond. "They always ask us how we know we're doing a good job. With AutoQuality's digitally recorded sessions and our P&Q Review scores on the Wall, we can make a strong, positive impression because we can demonstrate the quality standards we are reaching."

Benefits

Since incorporating the new quality initiatives, Lightbridge has realized the following benefits:

- Efficient monitoring — The time required for service observation is down 30 percent.
- Better service — Quality scores have risen 14 percent.
- Higher productivity — Productivity scores have risen 7 percent.
- Improved training and coaching — By using digital call recordings, trainers and supervisors can coach pro-actively by reinforcing the good points and pointing out areas for improvement.
- An ROI in about 12 months — The improvements in efficiency, quality and productivity have resulted in a timely return on the initial investment.

Significance

"Teknekron's ability to work within the framework of our existing equipment and their commitment to quickly get the system up and operating allowed us to efficiently create the quality monitoring environment we needed," says Deyermond. "Together these systems help us improve the quality of our customer service and provide increased reporting capabilities internally as well as a greater degree of control to the wireless clients who use us for outsourcing their call center services."

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(E-Talk Corporation, 1999, http://www.e-talk.com/teknekron/pdf/lightbridge.pdf)

APPENDIX C OPERATOR SURVEYS

TEST SURVEY

1.) ¿En cuáles de estos turnos abajo Ud. trabaja? *(escriba todo que aplica)*

☐ Mañana Días/Horas _____

☐ Tarde Días/Horas _____

☐ Noche Días/Horas _____

☐ Fin de Semana Días/Horas _____

2.) Clasifique los siguientes en escala de 1 a 5:

	demasiado corto		apropiado		demasiado largo
Duración de sus descansos	1	2	3	4	5
Tiempo que trabaja cada semana	1	2	3	4	5

3.) Clasifique las siguientes partes del programa Orchestra en escala de 1 a 5:

	pésimo		mediano		excelente
Velocidad	1	2	3	4	5
Eficacia	1	2	3	4	5
Apariencia	1	2	3	4	5

4.) ¿Hay un problema con el hecho que el programa Orchestra es en inglés?

☐ Sí ☐ No

5.) Clasifique los siguientes en escala de 1 a 5:

	muy inefectivo		apropiado		muy efectivo
Capacitación en general	1	2	3	4	5
Capacitación en Orchestra	1	2	3	4	5

6.) ¿Cuáles son sus recomendaciones a respecto de la capacitación, para mejorar su trabajo?

_____

_____

7.) ¿Cuál es su opinión sobre las siguientes?

	casi nada		mediano		mucho
Comentarios sobre su desempeño	1	2	3	4	5
	poco importante		indiferente		muy importante
Relevancia de su trabajo para Costa Rica	1	2	3	4	5
Relevancia de su trabajo para ICE	1	2	3	4	5

8.) ¿Cuáles son sus otras recomendaciones, sugerencias, o observaciones?

_____

_____

FINAL SURVEY

1.) ¿En cuáles de estos turnos abajo Ud. trabaja? *(escriba todo que aplica)*

- ☐ Mañana
- ☐ Tarde
- ☐ Noche
- ☐ Fin de Semana

2.) Clasifique los siguientes en escala de 1 a 5:

	demasiado corto		apropiado		demasiado largo
Duración de sus descansos	1	2	3	4	5
Tiempo que trabaja cada semana	1	2	3	4	5

3.) Clasifique las siguientes partes del programa Orchestra en escala de 1 a 5:

	pésimo		mediano		excelente
Velocidad	1	2	3	4	5
Eficacia	1	2	3	4	5
Apariencia	1	2	3	4	5

4.) ¿Hay un problema con el hecho que el programa Orchestra es en inglés?

☐ Sí ☐ No

5.) Clasifique los siguientes en escala de 1 a 5:

	muy inefectivo		apropiado		muy efectivo
Capacitación en general	1	2	3	4	5
Capacitación en Orchestra	1	2	3	4	5

6.) ¿Cuáles son sus recomendaciones a respecto de la capacitación, para mejorar su trabajo?

_____

_____

7.) ¿Cuál es su opinión sobre las siguientes?

	poco importante		indiferente		muy importante
Relevancia de su trabajo para Costa Rica	1	2	3	4	5
Relevancia de su trabajo para ICE	1	2	3	4	5
	casi nada		mediano		mucho
¿Su supervisor le indica como fue su desempeño?	1	2	3	4	5

8.) ¿Cuáles son sus otras recomendaciones, sugerencias, o observaciones?

_____

_____

APPENDIX D SAMPLE INTERVIEW FOR SUPERVISORS

These interviews were conducted more as a conversation than as a spoken survey. During the course of the conversation, the following points were addressed:

- The quality of service provided at Information Service 113.
- The performance of the operators at Information Service 113.
- The quality of the training given to said operators.

For each of the three main points, the following information was requested:

- How the supervisor feels about the current standards in place for each of the above points.
- Where the supervisor would like to see the standards at in the future.
- Suggestions for how to go about achieving said desired standards.

Because of the unstructured and conversational style of the interviews, the information gained from said interviews was not put into Chapter 4. However, information gained from the interviews about current procedures for evaluations and report creation and lists of errors that operators can commit can be found as background information in Chapter 2.

APPENDIX E COMPLETE RESULTS OF OPERATOR SURVEY

For Table E.1, below, the following list designates the heading for each column in the table. The headings were omitted from the actual table in order for the table to fit on the page in its entirety. Each heading is a reference to the fixed-response or dichotomous survey question that each column represents. The complete questions can be found in Appendix C.

– Survey Number

A – Shift Worked (***M***orning, ***A***fternoon, ***N***ight, ***W***eekend)

B – Length of Breaks

C – Hours Worked per Week

D – Speed of Orchestra

E – Efficiency of Orchestra

F – Appearance of Orchestra

G – Problem with Orchestra in English (***Y***es or ***N***o)

H – Training in General

I – Training on Orchestra

J – Importance of Job to Costa Rica

K – Importance of Job to I.C.E.

L – Feedback

#	A	B	C	D	E	F	G	H	I	J	K	L
1	M	1	5	3	2	4	Y	3	2	5	3	
2	M	3	5	5	1	3	Y	1	1	5	3	
3	M	1	3	3	1	3	N			5	5	
4	M	4	4	4	3	4	N	2	2	5	4	
5	M	2	3	4	2	5	N	4	4	5	5	
6	M	3		3	2	4	N	3	2	1	1	
7	M	3	3			4	N	3	2	5	5	
8	A	3	4	4	3	4	Y	4	3	4	4	
9	M	2	3	3	1	3	N	3	2	4	4	
10	M, A	3	3	4	3	4	N	2	3	5	5	
11	M	3	3	5	5	5	N	5	5	5	2	
12	M	3	3	5	4	5	Y	3	3	3	3	
13	M, A	1	4	3	2	2	N	3	3	3	3	
14	M, A	1	3	1			N	3		1	5	
15	M, A	1	3	2	1	2	N	2	3		5	
16	M	1	5	2	2	4	N	3	3	4	2	
17	M, A, N	2	3	3	1	3	Y	4	4	5	4	2
18	A	3	3	3	2	4	N	3	3	4	4	3
19	M, A	3	3	4	4	2	N	4	4	4	4	1
20	M, A	2	3	3	2	3	N	2	4	2	3	2
21	M	3	3	4	3	4	N			5	5	3
22	M	3	3	1	1	1	N	3	3	5	5	3
23	M, A	2	3	3	2	3	N	3	1	4	3	1
24	A	3	3	5	3	5	N	2	2	4	4	
25	A	3		1	1	3	N	5	4	5	5	
26	A	3	3	3	3	3	N	1	1	5	5	1
27	M	3	3	2	2	4	Y	4	4	5	5	4
28	M	1	4	4	3	4	Y	3	2	5	3	1
29	A	3	3	3	2	2	N	3	3	5	5	3
30	M	2	3	2	2	2	N	2	2	4	4	1
31	M, A	3	3							5	3	1
32	M	3	5	1	1	1	Y			5	5	1
33	M	3	3	3	1	4	N	3	3	5	5	1
34	M	2	5	2	1	5	N	3	4	4	5	3
35	A, N	1	3	2	2	2	N	5	3	5	5	1
36	M	2	2	3	1	1	N	1	1	5	3	3
37	M	2	4	3	3	5	N	5	5	5	4	3
38	N	3	3	2	3	4	Y	4	3	5	5	1
39	A, N	2	3	3	2	5	N	3	2	5	3	1
40	N	2	3	5	1	4	Y	2	3	4	4	1
41	A, N	2	3	2	2	4	Y	2	2	5	5	2
42	M	2	3	2	1	4	N	2	2	5	5	1
43	M		3	3	1	5	N	3	3	5	4	1
44	M	2	3	5	2	4	N	3	3	5	5	1
45	A	3	3	3	2	5	N	3	3	5	5	3
46	M	1	2	1	1	3	Y	3	3	5	3	1

47	M	3	5	3	1	4	N	4	1	5	5	1
48	A, N	2	3	2	2	4	Y	5	4	4	4	1
49	N	3	3	2	3	4	Y	4	3	5	5	1
50	M	3	3	3	2	5	N	3	3	3	3	
51	N	3	3	3	1	5	N	3	3	5	5	3
52	A	1	3	5	1	3	N	4	3	3	3	2
53	A, N	3	3	2	1	4	N	5	5	5	5	4
54	M, A	3	3	1	1	2	N	3	3	5	5	3
55	M, A, N	3	3	1	3	3	N	2	5	5	5	3
56	A	3	3	3	1	1	N	3	1	5	5	1
57	A	3	3	2	4	4	Y	3	3	5	5	5
58	A	3		4	1	5	N	1		5	5	1
59	A	1		3	2	3	N	4	4	3	3	1
60	A	3	3	2	1	3	N	2	2	2	2	3
61	M, A, N	3	3	3	4	4	N	3	3	5		1
62	A	3	3	3	3	5	N	1	2	4	5	2
63	M, A	2	3	2	3	4	N	3	3	4	4	3
64	M, A, N	3	5	2	2	2	N	4	4	4	4	5
65	A	3	3	1	1	4	N	2	2	4	3	2
66	A		3	4	4	2	Y	2	2	5	5	1
67	A, N	2	3	2	2	4	N	3	3	5	3	1
68	M, A, N	3	3	3	3	3	Y	4	4	5	3	2
69	A	1	3	3	1	3	N	3	5	5	5	1
70	W	3	3	1	1	1	N	2	3	5	1	1
71	W	2	3	1	2	2	N	3	2	4	3	2
72	M	2	4	3	3	4	N	5	4	5	5	2
73	A	3	3	1	2	3	N	3	2	5	5	1
74	W	3	3	3	3	5	N	3	3	5	5	1
75	W	3		4	4	5	N	2	2	5	3	1

Table E.1 Results of Dichotomous and Fixed-Response Questions

Table E.1 shows the complete results of the dichotomous and fixed-response questions of the operator survey. The complete questions can be found in Appendix C. Within Table E.1, a box with no data signifies that the operator did not provide a response. The responses from the test survey in column L were ommitted from the table because the responses were not used in the final data collection. A box that contains red text signifies results from the test survey. A brief analysis of the results of Table E.2 can be found in Section 4.1

For Table E.2, below, the following list designates the heading for each column in the table. Each heading is a reference to the open-response survey question that each column represents. The complete questions can be found in Appendix C.

– Survey Number

A – Recommendations/Suggestions for Training

B – Recommendations/Suggestions in General

#	A	B
1	general & comprehension of quality dpt.	Make Orchestra work correctly
2	system & database	Better program and bigger database
3		
4	How to find information (new people)	Better training, make orchestra work ($$)
5	Longer training period	Make orchestra work
6	More detailed	Make orchestra work
7	More practice & other services of ICE	Make orchestra work (faster w/o problems), program more specific (location)
8	practice w/ database, abbreviated entries	Make orchestra work
9		Improvement of quality of program (make orchestra work)
10	Longer training period	Make orchestra work
11		Make orchestra work
12	Modificar los datos	Improve the system & better database
13	Real life examples (what can happen)	Make orchestra work
14		Improve the system
15	Real life examples (what can happen)	Make orchestra work
16		
17		
18	Standard answers to FAQ's	More search options for Orchestra
19		Make orchestra work, stop ignoring the problem
20	Longer training period	Make orchestra work, stop ignoring the problem
21	Make orchestra work	
22		Make orchestra work
23	Better explanation of system, how to treat clients	Make orchestra work, better working environment
24	More communication with quality control staff	Make orchestra work, better working environment, know most common errors
25		Make orchestra work
26	More detailed, most common errors	Make orchestra work

27	Work in smaller groups	If things don't work get rid of them, operators treated like objects by ICE
28	Longer training period, use software from beginning, a room to practice w/ software	Motivation from quality control staff, make orchestra work
29		Make orchestra work
30	Want some training	
31		
32	More practice	Make orchestra work, stop ignoring the problem
33	Want some training	Make orchestra work
34	Make orchestra work	
35	Learn by doing	Make orchestra work, more motivation, better working environment
36	Make orchestra work	Make orchestra work
37		Make orchestra work, better database
38	Speaches from quality control	Make orchestra work, better working environment
39	Better Database	Lighting in the room, improve supervising, improve administration, make orchestra work
40	Likes it	More communication between operators and quality control, make orchestra work
41	More practice using the system, talk more about the rules	Rewards for good operators, training for bad operators
42	practice w/ database, abbreviated entries	Make orchestra work, treated like human beings
43	Focus on importance of the client	Make orchestra work
44	Trained with program problems	Wants to know the errors, better working environment
45		Wants to know the errors, better database, make orchestra work
46	Make orchestra work	Make orchestra work
47	More practice with orchestra	Make orchestra work
48	Base salary for operators	More communication, make orchestra work, treated like humans, motivation, better working environment
49	Make orchestra work	Wants to know the errors
50		Make orchestra work
51	Likes it	Treat them like human beings
52	More practice	Make orchestra work, new chairs, face to face communications
53	Tell what can go wrong with Orchestra	
54	Tell what can go wrong with Orchestra	Make orchestra work
55	More practice with orchestra	
56	Make orchestra work	Make orchestra work
57	Make orchestra work	
58	More training about ICE and changes to database	Fix the lights

59		
60	More practice with system	Fix the database, Make orchestra work, change the chairs, record all of the interactions of quality
61	Base salary for first two months	Make orchestra work
62	Fix the training	Modify the quality to avoid errors
63		Fix the tools
64	More emphasis on how to search, skills of the trainers	Better maintenance of equipment
65	More practice with the database	Make orchestra work, fix the database
66		Make orchestra work
67	Better motivation, incentives for new employees	Better working environment, more communication, make orchestra work
68		Receive the same # of calls each day
69		Make orchestra work, better working environment
70	Longer, more detailed, done by people that know what they are doing	Make orchestra work
71		Night and weekend people need somebody to talk to (personal calls)
72	A lot of practice	Make orchestra work, change the way that they are charged
73	Training is good, fix the system	Make orchestra work
74		Fix the lights, give two breaks to people who work 6 hours (30, 15)
75	More emphasic on street names, more practice	Make orchestra work, shifts are too long

Table E.2 Responses of Open-Response Questions

Table E.2 shows the responses of the open-response questions of the operator survey. The complete questions can be found in Appendix C. A box shaded in gray signifies that the operator did not reply to the question. Boxes containing red text signify responses from the test survey. A brief analysis of the results found in Table E.2 can be found in Section 4.1.

APPENDIX F COMPLETE RESULTS OF OPERATOR RATING SYSTEM

For Table F.1, below, the following list designates the heading for each column in the table. The headings were omitted from the actual table in order for the table to fit on the page in its entirety:

A – Number of days worked in the month

B – Average time spend per call

C – Total number of calls received

D – Number of errors committed

E – Total number of calls evaluated

F – Total number of evaluated calls correctly answered

G – Percentage of evaluated calls correctly answered

H – Operator's Grade

	A	B	C	D	E	F	G	H
Adonay Solís	13	22	12380	0	371	371	100.00%	A
Antonieta Saenz	12	22	6852	0	206	206	100.00%	A
David Mayo	25	20	23520	0	706	706	100.00%	A
Dora Guillén	24	24	17558	0	527	527	100.00%	A
Elieth País	24	27	13054	0	392	392	100.00%	A
Elieth Segura	27	23	4543	0	136	136	100.00%	A
Elizabeth Bolaños	25	22	22921	0	688	688	100.00%	A
Guisella Rodriguez	26	19	25618	0	769	769	100.00%	A
Ileana Cordero	19	20	12957	0	389	389	100.00%	A
Juan Segnini	23	23	14362	0	431	431	100.00%	A
Krisnard Sánchez	26	18	27126	0	814	814	100.00%	A
Laura Joya	22	18	23686	0	711	711	100.00%	A
Laura Sanchez	11	20	10221	0	307	307	100.00%	A
Laura Vargas	13	22	9248	0	277	277	100.00%	A
Maria R. Vargas	25	31	15915	0	477	477	100.00%	A
Marielos Salazar	27	19	27794	0	834	834	100.00%	A
Pablo Salazar	25	20	30483	0	914	914	100.00%	A
Ronaldo Anderson	16	24	12417	0	373	373	100.00%	A
Sonia Zamora	24	28	11584	0	348	348	100.00%	A

Vanessa Masis	25	22	21093	0	633	633	100.00%	A
Vanessa Ruiz	15	22	13727	0	412	412	100.00%	A
Wendy Artavia	25	24	23394	0	702	702	100.00%	A
Martina Cordoba	26	21	28830	1	865	864	99.88%	B
Maribelle Salazar	25	19	28450	1	854	853	99.88%	B
Esteban Arce	28	23	25672	1	770	769	99.87%	B
Silvia Valle	25	22	25162	1	755	754	99.87%	B
Nuria Salas	24	25	23018	1	691	690	99.86%	B
Fidel Diaz	21	20	22917	1	688	687	99.85%	B
Marisol Aguilar	26	19	21204	1	636	635	99.84%	B
Mauricio Melendez	29	22	20447	1	613	612	99.84%	B
Erick Corrales	23	20	20381	1	611	610	99.84%	B
Johel Barrrantes	23	21	19509	1	585	584	99.83%	B
Xinia Saenz	24	22	16886	1	507	506	99.80%	B
Ana Arroyo	24	28	16522	1	496	495	99.80%	B
Leonardo Pereira	20	22	16020	1	481	480	99.79%	B
Laura Morales	23	28	15877	1	476	475	99.79%	B
Evelyn Sánchez	21	23	15350	1	461	460	99.78%	B
David Zúñiga	21	22	14623	1	439	438	99.77%	B
Dunia Jiménez	28	20	29168	2	875	873	99.77%	B
Vladimir Sanchez	30	17	41815	3	1254	1251	99.76%	B
Blanca Murillo	17	22	12959	1	389	388	99.74%	B
Guiselle Rodriguez	29	20	24581	2	737	735	99.73%	B
Juan Fco. Chavez	26	20	23624	2	709	707	99.72%	B
Adrian Bustamante	24	20	23158	2	695	693	99.71%	B
Johnny Molina	11	19	11148	1	334	333	99.70%	B
Andrea Contreras	12	22	10863	1	326	325	99.69%	B
Patricia Bermudez	25	25	20948	2	628	626	99.68%	B
Fiorella Guevara	26	17	29634	3	889	886	99.66%	B
Alexander Moscoso	27	19	28946	3	868	865	99.65%	B
Walkiria Mata	12	24	9572	1	287	286	99.65%	B
Roxana Perez	25	22	18820	2	565	563	99.65%	B
Jonathan Muñoz	28	18	37371	4	1121	1117	99.64%	B
Arnoldo Bermúdez	27	20	27870	3	836	833	99.64%	B
Lil Sequeira	26	18	27559	3	827	824	99.64%	B
Alexander Mora	27	20	26799	3	804	801	99.63%	B
Dulce Chavarria	10	19	8666	1	260	259	99.62%	B
Adriana Murillo	27	26	16462	2	494	492	99.60%	B
Gina Redondo	25	23	24047	3	721	718	99.58%	B
Catalina Porras	27	19	23068	3	692	689	99.57%	B
Luis Carlos Mora	29	20	28968	4	869	865	99.54%	B
Oswaldo Delgado	31	19	42711	6	1281	1275	99.53%	B
Marielos Ramirez	23	25	14236	2	427	425	99.53%	B
Fanny Torres	25	26	14102	2	423	421	99.53%	B

Carmen Carvajal	27	27	21035	3	631	628	99.52%	B
Carolina Campos	24	21	20856	3	626	623	99.52%	B
Gustavo Vargas	23	21	27025	4	811	807	99.51%	B
Juan Jose Gúzman	25	22	20141	3	604	601	99.50%	B
Cindy Saborío	23	25	13225	2	397	395	99.50%	B
Robert Hernan Mora	23	25	19375	3	581	578	99.48%	B
Denia Garro Garita	26	22	24827	4	745	741	99.46%	B
Dylana Calderón	23	20	6026	1	181	180	99.45%	B
Laura Rojas	26	20	23571	4	707	703	99.43%	B
Roger Quesada	25	19	22673	4	680	676	99.41%	B
Sergio Centeno	13	22	11305	2	339	337	99.41%	B
Marco A. Cambronero	27	22	22546	4	676	672	99.41%	B
Linette Díaz	25	19	28170	5	845	840	99.41%	B
Angelica Alfaro	25	21	27913	5	837	832	99.40%	B
Carol Valverde	26	19	27892	5	837	832	99.40%	B
Marcia Sanchun	19	17	21980	4	659	655	99.39%	C
Daniela Varela	26	23	21370	4	641	637	99.38%	C
Maury Arguedas	26	21	21223	4	637	633	99.37%	C
Jose Pablo Solano	25	22	15780	3	473	470	99.37%	C
Guido Masís	26	22	26288	5	789	784	99.37%	C
Carlos Ordóñez	23	22	15725	3	472	469	99.36%	C
Freddy Cordero	26	19	24899	5	747	742	99.33%	C
Darling Mendoza	25	23	14838	3	445	442	99.33%	C
Vivian Chavez	27	20	29161	6	875	869	99.31%	C
Javier Madrigal	23	20	19335	4	580	576	99.31%	C
Celia Martínez	27	26	23822	5	715	710	99.30%	C
Sandra Gongora	27	27	9353	2	281	279	99.29%	C
Johanna Chavez	21	20	20940	5	628	623	99.20%	C
María Zavaleta	26	22	15703	4	471	467	99.15%	C
Melissa Zuñiga	26	20	19237	5	577	572	99.13%	C
Roberto Rojas	26	23	23026	6	691	685	99.13%	C
Sandra Alvarez	11	22	7511	2	225	223	99.11%	C
Alexandra Rodríguez	26	20	22467	6	674	668	99.11%	C
Mauricio Salas	24	22	18564	5	557	552	99.10%	C
Marianella Céspedes	25	21	23345	7	700	693	99.00%	C
Olga Marin	27	26	16572	5	497	492	98.99%	C
Joselyn Leon	17	25	9632	3	289	286	98.96%	C
Haichel Hernandez	27	26	12802	4	384	380	98.96%	C
Johnny Perez	14	25	9526	3	286	283	98.95%	C
Juan Carlos Obando	27	20	23879	8	716	708	98.88%	C
Franz Fernandez	21	25	10655	4	320	316	98.75%	C
Monica Mendez	23	25	15664	6	470	464	98.72%	C
Eliana Rios	23	20	18207	7	546	539	98.72%	C
Yorlenny Chavez	25	19	25988	10	780	770	98.72%	C

Rolando Solera	28	24	26191	11	786	775	98.60%	C
Nicsy Perez	27	21	24996	11	750	739	98.53%	C
Seidy Alvarado	27	24	10854	5	326	321	98.46%	C
Andres Ramirez	16	21	14892	7	447	440	98.43%	C
Wendy Chávez	25	21	21121	10	634	624	98.42%	C
Andrea Abarca	8	18	9804	5	294	289	98.30%	C
Patryk Jara	28	21	21958	13	659	646	98.03%	C
Jose Barboza	24	22	18040	11	541	530	97.97%	D
Luis Carlos Campos	20	20	6059	4	182	178	97.80%	D
Ana Carrrillo	19	26	9043	6	271	265	97.79%	D
Juan Diego Murillo	22	18	19916	14	597	583	97.66%	D
Maritza Oviedo Arguello	22	24	10839	8	325	317	97.54%	D
Marianella Cubero	6	26	3192	4	96	92	95.82%	D

Table F.1 Complete Results of Operator Rating System

An overall analysis of the results listed in Table F.1 can be found in Section 4.2. The operator grades for both Table F.1 and the overall analysis in Section 4.2 are based on the ranges of grades defined in Section 3.23.

APPENDIX G COMPLETE RESULTS OF SERVICE RATING SYSTEM

For Tables G.1 and G.2, the following list designates the heading for each column in the table. The headings were omitted from the actual table in order for the table to fit on the page in its entirety:

A – Number of calls received

B – Number of calls answered

C – Percentage of calls answered

D – Number of calls not answered

E – Percentage of calls not answered

F – Number of calls with errors

G – Number of calls answered correctly

H – Percentage of calls answered correctly

I – Service grade

Tables G.1 and G.2, on the following page, are the complete monthly breakdown of the results of the Service rating system for the years of 1999 and 2000, respectively.

	A	B	C	D	E	F	G	H	I
January	1,856,695	1,689,487	90.99%	167,208	9.01%	29,301	1,660,186	89.42%	3
February	1,771,338	1,636,316	92.38%	135,022	7.62%	30,751	1,605,565	90.64%	2
March	1,981,052	1,806,697	91.20%	174,355	8.80%	22,431	1,784,266	90.07%	2
April	1,887,723	1,722,703	91.26%	165,020	8.74%	25,889	1,696,814	89.89%	3
May	1,943,941	1,751,720	90.11%	192,221	9.89%	30,010	1,721,710	88.57%	3
June	2,376,791	1,808,294	76.08%	568,497	23.92%	15,462	1,792,832	75.43%	4
July	2,377,677	2,018,225	84.88%	359,452	15.12%	25,335	1,992,890	83.82%	4
August	2,389,243	2,233,471	93.48%	155,772	6.52%	33,908	2,199,563	92.06%	2
September	1,021,140	957,190	93.74%	63,950	6.26%	33,876	923,314	90.42%	2
October	2,516,921	2,295,446	91.20%	221,475	8.80%	35,544	2,259,902	89.79%	3
November	2,602,579	2,420,973	93.02%	181,606	6.98%	38,887	2,382,086	91.53%	2
December	2,777,194	2,561,369	92.23%	215,825	7.77%	29,794	2,531,575	91.16%	2
Total	25,502,294	22,901,891	89.80%	2,600,403	10.20%	351,188	22,550,703	88.43%	3

Table G.1 Overall Results for Service Rating System for 1999

	A	B	C	D	E	F	G	H	I
January	2,851,967	2,580,059	90.47%	271,908	9.53%	32,217	2,547,842	89.34%	3
February	2,648,937	2,443,964	92.26%	204,973	7.74%	75,988	2,367,976	89.39%	3
March	2,891,590	2,609,902	90.26%	281,688	9.74%	19,226	2,590,676	89.59%	3
April	2,611,382	2,165,409	82.92%	445,973	17.08%	30,620	2,134,789	81.75%	4
May	2,905,331	2,616,298	90.05%	289,033	9.95%	48,295	2,568,003	88.39%	3
Total	13,909,207	12,415,632	89.26%	1,493,575	10.74%	206,346	12,209,286	87.78%	3

Table G.2 Overall Results for Service Rating System for 2000

Some of the results in Tables G.1 and G.2, above, are displayed graphically in Section 4.3. Figures 4.9 and 4.10 show the percentage of correctly answered calls monthly for 1999 and 2000, respectively. Figure 4.12 shows a comparison of the overall percentage of correctly answered calls for the two years. However, in order for the company to be able to see trends between individual months from year to year, this information has been included in Figure G.1, on the following page:

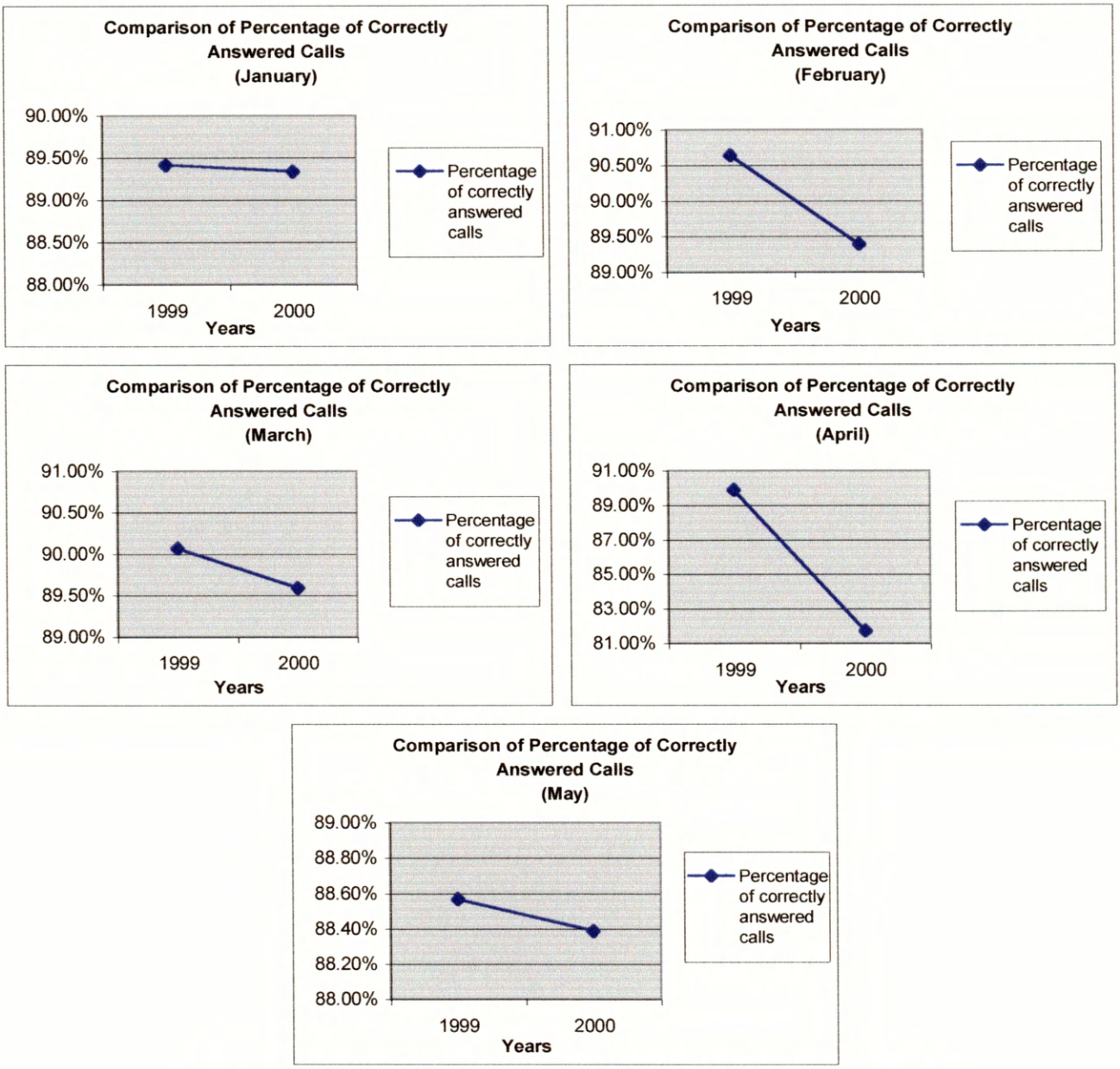


Figure G.1 Monthly Comparisons of Service Performance

A brief analysis of the data presented in Figure G.1, above, can be found in Section 4.3. To reiterate the information found in the section, the decline in performance from 1999 to 2000 for the five months illustrated in Figure G.1 is fairly apparent, although in all cases but April the decline is not severe.

APPENDIX H MANUAL FOR PROGRAMA DE VISTA GENERAL (PVG)

Table of Contents

INTRODUCIÓN

Desde su creación el Servicio de Información 113 busca ofrecer a los clientes del ICE, un servicio de alta calidad.

El Programa de Vista General (PVG) fue diseñado para facilitar el proceso de evaluación del servicio y continuamente mejorarlo.

Este manual es una orientación de como utilizar el programa y como hacer modificaciones en caso de cambio de la política o del modo de evaluación en el futuro.

DEFINICIÓN DE LA CONFIGURACIÓN DEL SISTEMA

El libro de Excel está compuesto por veintiuna hojas de trabajo. Las hojas de trabajo llamadas de "1999, 2000, 2001, 2002, 2003, 2004, y 2005"; son los informes anuales y están compuestos de tres tablas y dos gráficos. La hoja llamada de "Años" es la comparación anual y está compuesta por una tabla y dos gráficos. Las hojas "Enero, Febrero, Marzo, Abril, Mayo, Junio, Julio, Agosto, Septiembre, Octubre, Noviembre, y Diciembre"; responden a las comparaciones mensuales y están compuestas por una tabla y dos gráficos.

¿CÓMO SE DEBE HACER LA ENTRADA DE DATOS EN EL PVG?

Los informes anuales están compuestos de tres tablas y de dos gráficos. La primera tabla está compuesta de nueve columnas: "Meses, Número total de llamadas recibidas, Número total de llamadas atendidas, Porcentaje de llamadas atendidas, Número total de llamadas no atendidas, Porcentaje de llamadas no atendidas, Número total de llamadas con error, Número total de llamadas atendidas correctamente, y Porcentaje de llamadas atendidas correctamente". De éstas, solo las columnas tituladas: "Número total de llamadas recibidas", "Número total de llamadas atendidas", y "Número total de llamadas con error", necesitan ser llenadas con los datos que son provistos por el ACD y por el departamento de producción.

Instrucciones sobre como debe ser hecha la entrada de data en el programa.

1. Abrir el programa
2. Cliquear en una de las hojas llamadas "1999, 2000, 2001, 2002, 2003, 2004, ó 2005" (dependiendo del año presente)
3. Llenar las columnas (con las informaciones próvidas por el ACD y el informe mensual de producción):
   3.1. Número total de llamadas recibidas,
   3.2. Número total de llamadas atendidas,
   3.3. Número total de llamadas con error, (que están representadas en amarillo en la figura abajo)
4. Guardar las modificaciones
5. El programa está listo para ser analizado.

	A	B	C	D	E	F	G	H	I
1									
2	**INFORME ANUAL**								
3									
4									
5	**Meses**	**Llamadas Recibidas**	**Llamadas Atendidas**	**Porcentaje de llamadas atendidas**	**Llamadas no atendidas**	**Porcentaje de llamadas no atendidas**	**Llamadas con error**	**Llamadas atendidas correctamente**	**Porcentaje de llamadas atendidas correctamente**
6									
7	**Ene**			=C7/B7	=B7-C7	=E7/B7		=C7-G7	=H7/B7
8	**Feb**			=C8/B8	=B8-C8	=E8/B8		=C8-G8	=H8/B8
9	**Mar**			=C9/B9	=B9-C9	=E9/B9		=C9-G9	=H9/B9
10	**Abr**			=C10/B10	=B10-C10	=E10/B10		=C10-G10	=H10/B10
11	**May**			=C11/B11	=B11-C11	=E11/B11		=C11-G11	=H11/B11
12	**Jun**			=C12/B12	=B12-C12	=E12/B12		=C12-G12	=H12/B12
13	**Jul**			=C13/B13	=B13-C13	=E13/B13		=C13-G13	=H13/B13
14	**Ago**			=C14/B14	=B14-C14	=E14/B14		=C14-G14	=H14/B14
15	**Sep**			=C15/B15	=B15-C15	=E15/B15		=C15-G15	=H15/B15
16	**Oct**			=C16/B16	=B16-C16	=E16/B16		=C16-G16	=H16/B16
17	**Nov**			=C17/B17	=B17-C17	=E17/B17		=C17-G17	=H17/B17
18	**Dic**			=C18/B18	=B18-C18	=E18/B18		=C18-G18	=H18/B18
19									

Tabla H.1 Informe Anual del PVG

¿CÓMO ANALIZAR LOS INFORMES DEL PVG?

Informes Anuales

Los informes anuales están compuestos de tres tablas y de dos gráficos. La primera tabla, Tabla H.1, está compuesta de nueve columnas: "Meses, Número total de llamadas recibidas, Número total de llamadas atendidas, Porcentaje de llamadas atendidas, Número total de llamadas no atendidas, Porcentaje de llamadas no atendidas, Número total de llamadas con error, Número total de llamadas atendidas correctamente, y Porcentaje de llamadas atendidas correctamente".

Las columnas "Porcentaje de llamadas atendidas, Número total de llamadas no atendidas, Porcentaje de llamadas no atendidas, Número total de llamadas atendidas correctamente, y Porcentaje de llamadas atendidas correctamente"; son compuestas por formulas que están representadas en la Tabla H.1.

Cada una de estas nueve columnas nos muestra una información diferente para analizar el servicio:

- Número total de llamadas recibidas: representa el número total de personas que llamaran el servicio.
- Número total de llamadas atendidas: representa el número total de personas que fueran atendidas por los operadores
- Porcentaje de llamadas atendidas: representa cual fue el porcentaje de clientes atendidos por los operadores
- Número total de llamadas no atendidas: representa el número de personas que llamaron el servicio y por un error en el sistema su llamada no fue contestada
- Porcentaje de llamadas no atendida: representa cuál fue el porcentaje de llamadas que no fueron contestadas
- Número total de llamadas con error: representa el número total de llamadas que fueron contestadas incorrectamente por los operadores
- Número total de llamadas atendidas correctamente: representa el número total de llamadas que fueron contestadas por los operadores de manera satisfactoria para garantizar la calidad del servicio

- Porcentaje de llamadas atendidas correctamente: representa el porcentaje de llamadas que fueran contestadas dentro del modelo de calidad del servicio.

La segunda tabla, Tabla H.2, está compuesta por cinco columnas: "Meses, Número total de llamadas recibidas, Número total de llamadas atendidas correctamente, Porcentaje de llamadas atendidas correctamente y Nota del servicio". Esta tabla tiene sus columnas automáticamente llenadas por las formulas representadas en Tabla H.1 y representa los resultados finales del año, mes a mes.

Cada una de estas cinco columnas deben ser analizadas por:

- Número total de llamadas recibidas: representa el número total de personas que usaron el servicio.
- Número total de llamadas atendidas correctamente: representa el número total de llamadas que fueron contestadas por los operadores de manera satisfactoria para garantizar la calidad del servicio
- Porcentaje de llamadas atendidas correctamente: representa el porcentaje de llamadas que fueran contestadas dentro del modelo de calidad del servicio
- Nota del servicio: representa como el servicio fue clasificado en el mes

	A	B	C	D	E
22					
23 24		**Llamadas Recibidas**	**Llamadas atendidas correctamente**	**Porcentaje de llamadas atendidas correctamente**	**Nota del servicio**
25	**Ene**	=B7	=H7	=I7	=IF(D23)<((I23)/100),IF(D23)<((I24)/100),IF(D23)<((I25)/100),IF(D23)<((I26)/100),G27,G26),G25),G24),G23)
26	**Feb**	=B8	=H8	=I8	|
27	**Mar**	=B9	=H9	=I9	|
28	**Abr**	=B10	=H10	=I10	|
29	**May**	=B11	=H11	=I11	|
30	**Jun**	=B12	=H12	=I12	|
31	**Jul**	=B13	=H13	=I13	|
32	**Ago**	=B14	=H14	=I14	|
33	**Sep**	=B15	=H15	=I15	|
34	**Oct**	=B16	=H16	=I16	|
35	**Nov**	=B17	=H17	=I17	|
36	**Dec**	=B18	=H18	=I18	|
37					|
38	**TOTAL**	=SUM(B23:B34)	=SUM(C23:C34)	=C36/B36	V

Tabla H.2 Resultados del Informe Anual del PVG

La tercera tabla es compuesta por tres columnas: lista de notas, nota más alta, y nota más baja. El sistema de evaluación es dividido en cinco niveles. El primero representa un servicio excelente, el segundo un servicio bueno, el tercero un servicio aceptable, y el cuarto un servicio pobre y finalmente el quinto un servicio inaceptable.

Las columnas representan:

- Lista de notas: las posibles notas que el servicio puede recibir
- Nota más baja y nota más alta: la definición del ranqueo de la clasificación

	G	H	I
21 22	**Lista de Notas**	**Nota Más Alta**	**Nota Más Baja**
23	1	100	95
24	2	95	90
25	3	90	85
26	4	85	75
27	5	75	0

Tabla H.3 Lista de Notas en el PVG

Además, hay dos gráficos que ayudan a visualizar lo que está ocurriendo. El primero es el porcentaje de llamadas atendidas correctamente por los meses del año. Este gráfico nos muestra una comparación de cual fue el desempeño del servicio mes a mes durante el año.

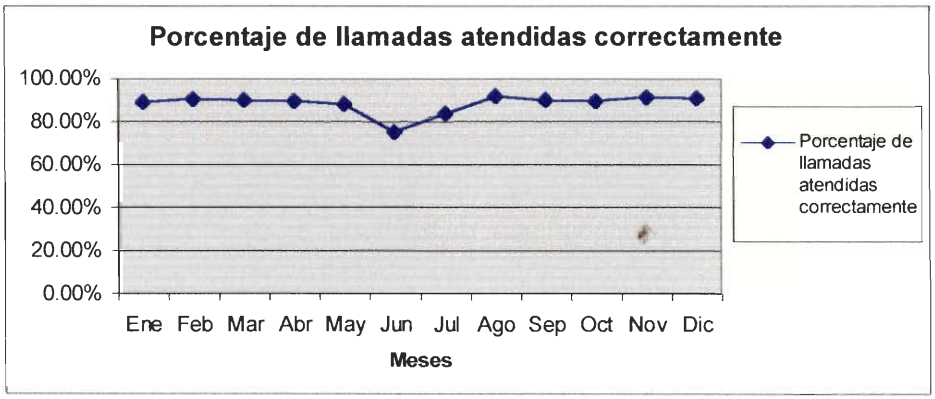


Figura H.1 Porcentaje de Llamadas Atendidas Correctamente (PVG)

El segundo gráfico es un panorama general del año, mirando el gráfico puede verse la comparación del número de llamadas recibidas en el mes por el número de llamadas correctamente atendidas en el mismo mes.

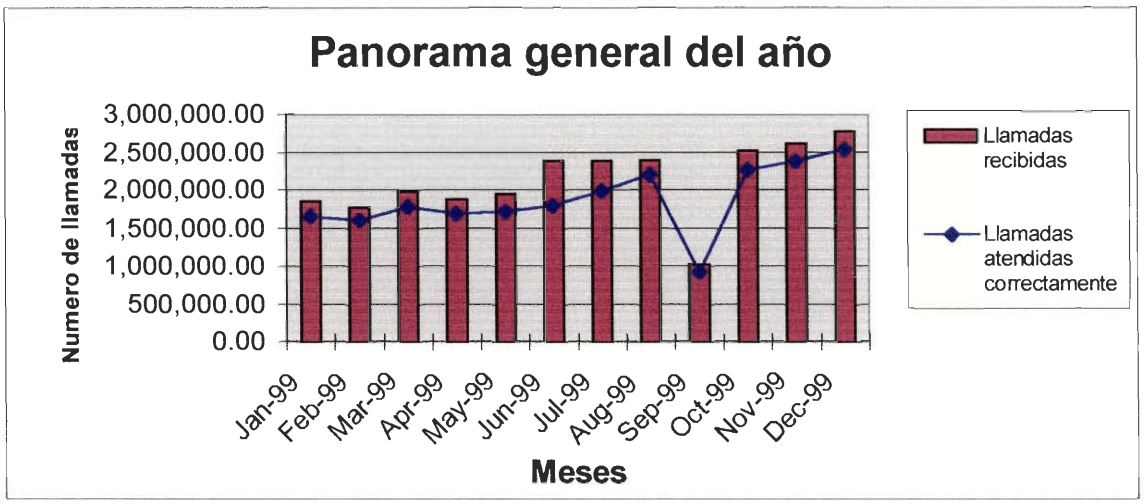


Figura H.2 Panorama General del Año (PVG)

Comparación Anual

La comparación anual es compuesta de una tabla y de dos gráficos. La tabla, Tabla H.4 es compuesta por cinco columnas: "Años, Número total de llamadas recibidas, Número total de llamadas atendidas correctamente, Porcentaje de llamadas atendidas correctamente y Nota del servicio". Esta tabla tiene sus columnas automáticamente llenadas por las formulas representadas en la Tabla H.4 y representa los resultados finales de los años.

Cada una de estas cinco columnas deben ser analizadas por:

- Años, de 1999 a 2005.
- Número total de llamadas recibidas: representa el número total de personas que llamaran el servicio en el año.

- Número total de llamadas atendidas correctamente: representa el número total de llamadas que fueran contestadas por los operadores de manera satisfactoria para garantizar la calidad del servicio
- Porcentaje de llamadas atendidas correctamente: representa el porcentaje de llamadas que fueran contestadas dentro del padrón de calidad del servicio
- Nota del servicio: representa como el servicio fue clasificado en el año

	A	B	C	D	E
5 6		**Llamadas recibidas**	**Llamadas atendidas correctamente**	**Porcentaje de llamadas atendidas correctamente**	**Nota del servicio**
7	**1999**	='1999'!B36	='1999'!C36	='1999'!D36	='1999'!E36
8	**2000**	='2000'!B36	='2000'!C36	='2000'!D36	='2000'!E36
9	**2001**	='2001'!B36	='2001'!C36	='2001'!D36	='2001'!E36
10	**2002**	='2002'!B36	='2002'!C36	='2002'!D36	='2002'!E36
11	**2003**	='2003'!B36	='2003'!C36	='2003'!D36	='2003'!E36
12	**2004**	='2004'!B36	='2004'!C36	='2004'!D36	='2004'!E36
13	**2005**	='2005'!B36	='2005'!C36	='2005'!D36	='2005'!E36

Tabla H.4 Tabla de Comparación Anual (PVG)

Además, hay dos gráficos que ayudan a visualizar lo que está ocurriendo. El primero es el porcentaje de llamadas atendidas correctamente por los años. Este gráfico nos muestra una comparación de cual fue el desempeño del servicio año a año.

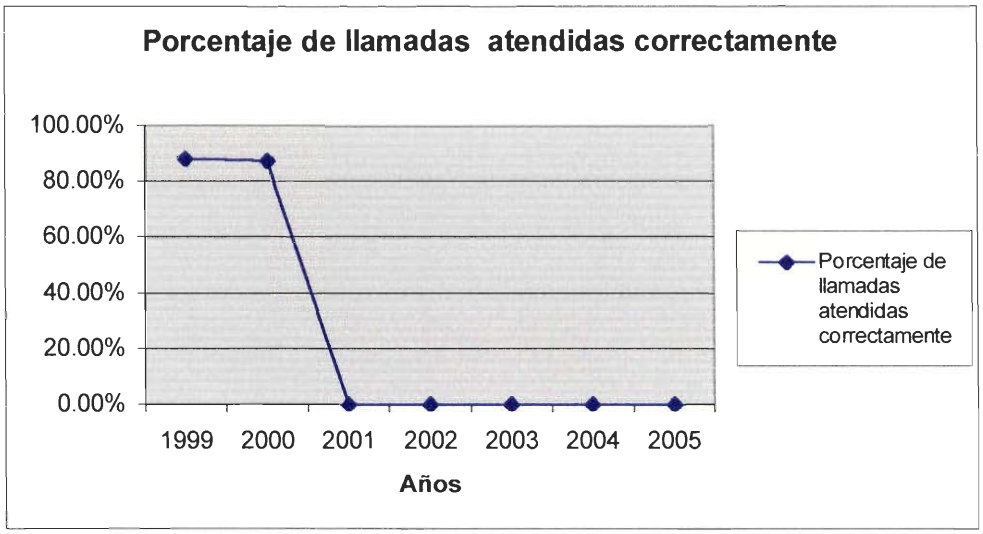


Figura H.3 Gráfico de Comparación Anual En Porcentaje (PVG)

El segundo gráfico es un panorama general de los años, mirando el gráfico puede verse la comparación del número de llamadas recibidas en el año por el número de llamadas correctamente atendidas en el mismo año.

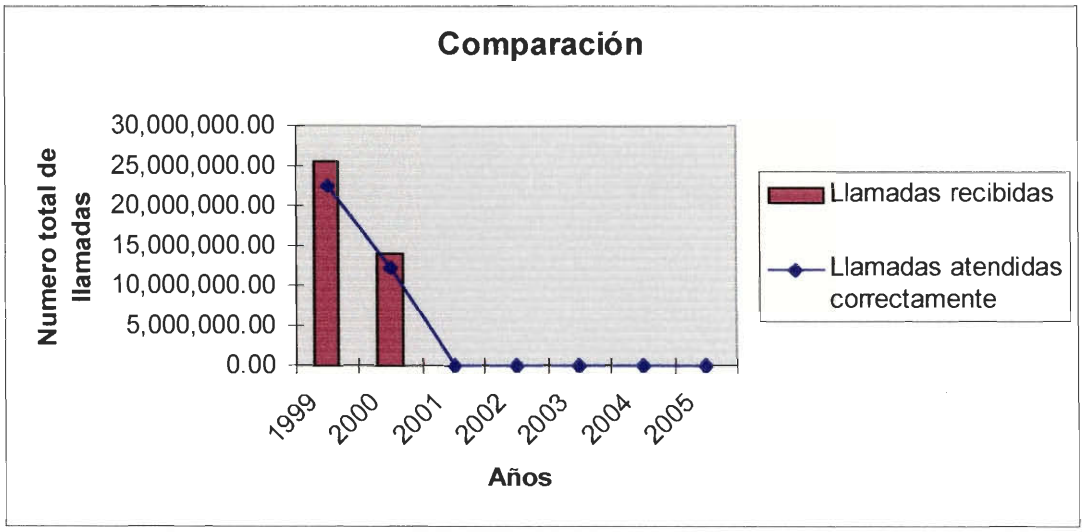


Figura H.4 Gráfico de Comparación Anual por Numero Total De Llamadas (PVG)

Comparación Mensual

La comparación mensual está compuesta de una tabla y de dos gráficos. La Tabla H.5 es compuesta por cinco columnas: meses, número total de llamadas recibidas, número total de llamadas atendidas correctamente, porcentaje de llamadas atendidas correctamente y nota del servicio. Esta tabla tiene sus columnas automáticamente llenadas por las formulas representadas en la Tabla H.5 y representa los resultados finales de los meses.

Cada una de estas cinco columnas deben ser analizadas por:

- Meses: cada una tiene una comparación anual de un mes (Ej. Ene-99 a Ene-05)
- Número total de llamadas recibidas: representa el número total de personas que llamaran el servicio en el mes.
- Número total de llamadas atendidas correctamente: representa el número total de llamadas que fueran contestadas por los operadores de manera satisfactoria para garantizar la calidad del servicio
- Porcentaje de llamadas atendidas correctamente: representa el porcentaje de llamadas que fueran contestadas dentro del padrón de calidad del servicio

Nota del servicio: representa como el servicio fue clasificado en el mes.

	B	C	D	E	F
5 6		**Llamadas recibidas**	**Llamadas atendidas correctamente**	**Porcentaje de llamadas atendidas correctamente**	**Nota del servicio**
7	**MES-99**	='1999'!B23	='1999'!C23	='1999'!D23	='1999'!E23
8	**MES-00**	='2000'!B23	='2000'!C23	='2000'!D23	='2000'!E23
9	**MES-01**	='2001'!B23	='2001'!C23	='2001'!D23	='2001'!E23
10	**MES-02**	='2002'!B23	='2002'!C23	='2002'!D23	='2002'!E23
11	**MES-03**	='2003'!B23	='2003'!C23	='2003'!D23	='2003'!E23
12	**MES-04**	='2004'!B23	='2004'!C23	='2004'!D23	='2004'!E23
13	**MES-05**	='2005'!B23	='2005'!C23	='2005'!D23	='2005'!E23

Tabla H.5 Tabla de Comparación Mensual (PVG)

Además, hay dos gráficos que ayudan a visualizar lo que está ocurriendo. El primero es el porcentaje de llamadas atendidas correctamente por los meses. Este gráfico nos muestra una comparación de cual fue el desempeño del servicio año a año por un único mes.

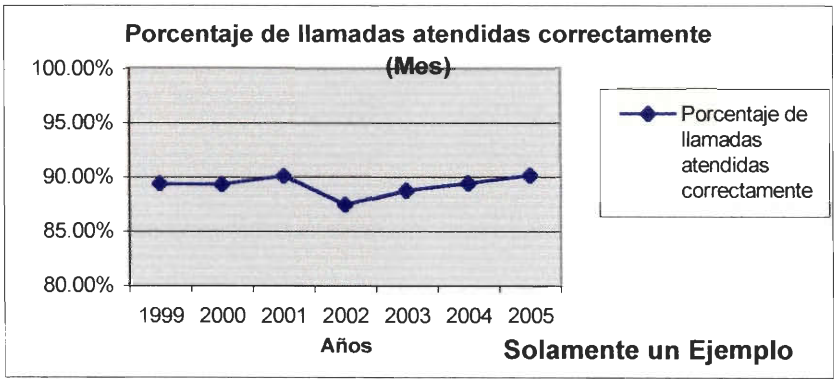


Figura H.5 Gráfico de Comparación Anual En Porcentaje Por Un Mes (PVG)

El segundo gráfico es un panorama general del año, mirando el gráfico puede verse la comparación del número de llamadas recibidas en el mes por el número de llamadas correctamente atendidas en el mismo mes.

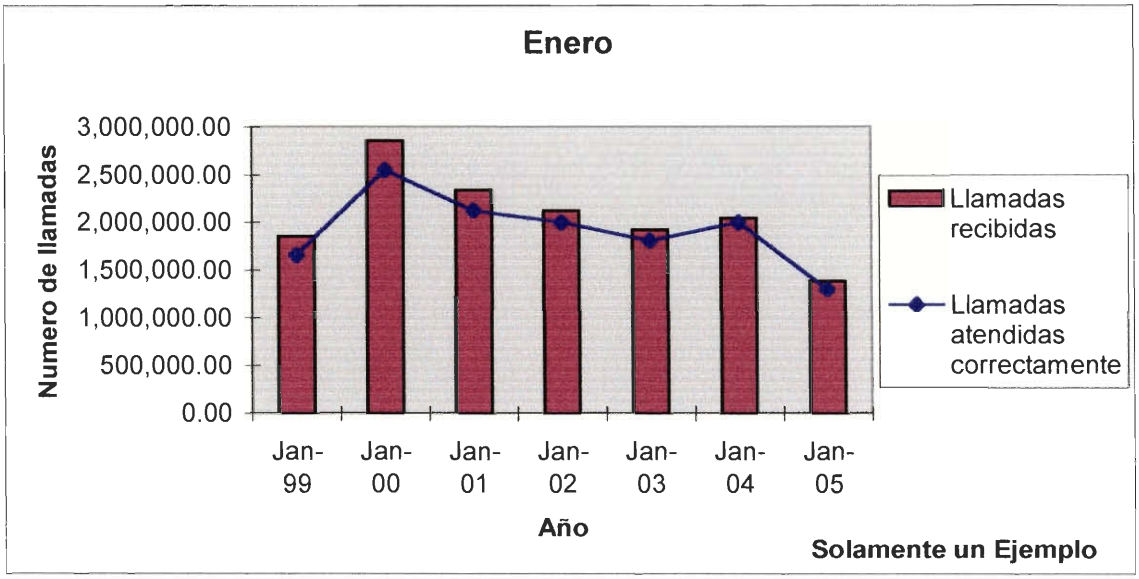


Figura H.6 Comparación Anual por Numero Total De Llamadas Por Mes (PVG)

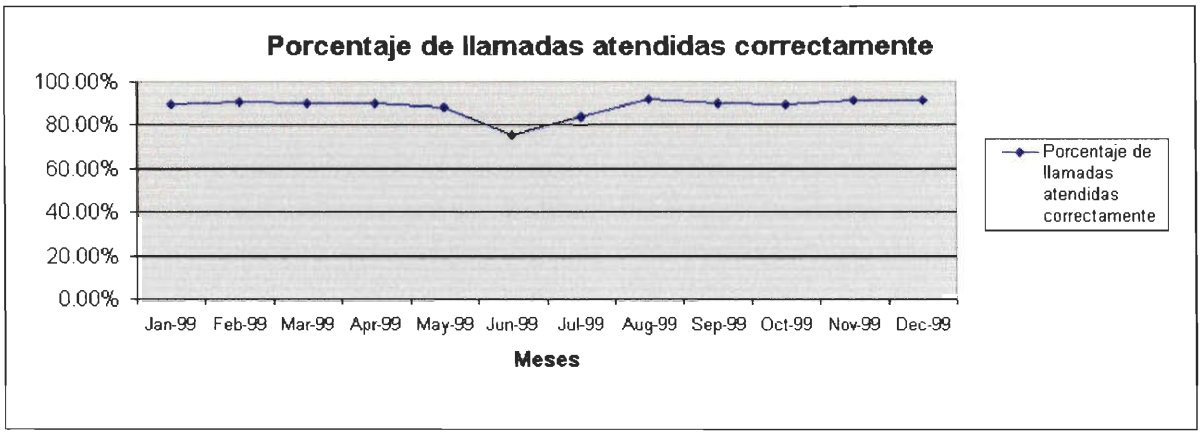
INFORME ANUAL 1999

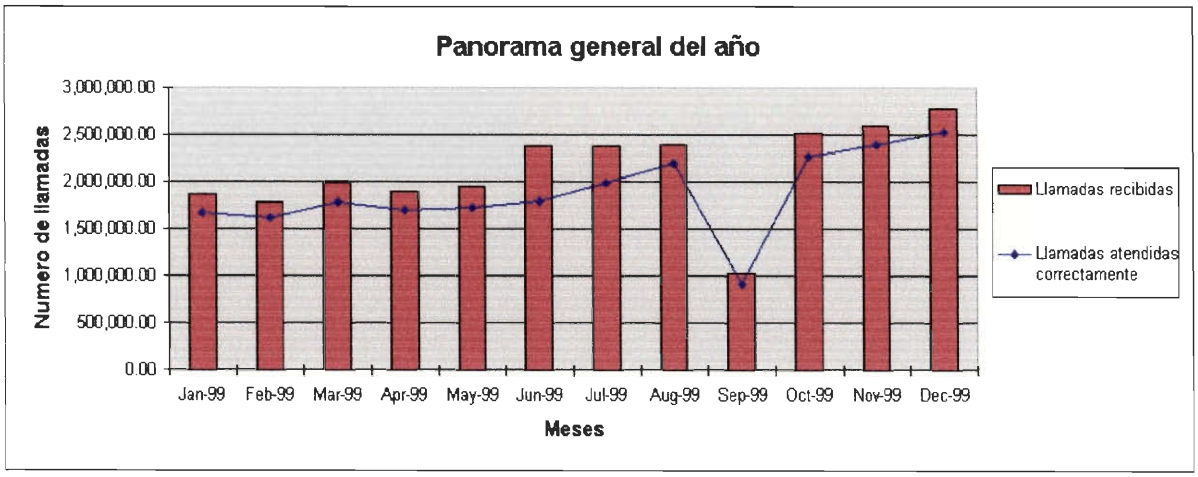
	Llamadas recibidas	Llamadas atendidas	Porcentaje de llamadas atendidas	Llamadas no atendidas	Porcentaje de llamadas no atendidas	Llamadas con error	Llamadas atendidas correctamente	Porcentaje de llamadas atendidas correctamente
Jan-99	1,856,695.00	1,689,487.00	90.99%	167,208.00	9.01%	29,301.00	1,660,186.00	89.42%
Feb-99	1,771,338.00	1,636,316.00	92.38%	135,022.00	7.62%	30,751.00	1,605,565.00	90.64%
Mar-99	1,981,052.00	1,806,697.00	91.20%	174,355.00	8.80%	22,431.00	1,784,266.00	90.07%
Apr-99	1,887,723.00	1,722,703.00	91.26%	165,020.00	8.74%	25,889.00	1,696,814.00	89.89%
May-99	1,943,941.00	1,751,720.00	90.11%	192,221.00	9.89%	30,010.00	1,721,710.00	88.57%
Jun-99	2,376,791.00	1,808,294.00	76.08%	568,497.00	23.92%	15,462.00	1,792,832.00	75.43%
Jul-99	2,377,677.00	2,018,225.00	84.88%	359,452.00	15.12%	25,335.00	1,992,890.00	83.82%
Aug-99	2,389,243.00	2,233,471.00	93.48%	155,772.00	6.52%	33,908.00	2,199,563.00	92.06%
Sep-99	1,021,140.00	957,190.00	93.74%	63,950.00	6.26%	33,876.00	923,314.00	90.42%
Oct-99	2,516,921.00	2,295,446.00	91.20%	221,475.00	8.80%	35,544.00	2,259,902.00	89.79%
Nov-99	2,602,579.00	2,420,973.00	93.02%	181,606.00	6.98%	38,887.00	2,382,086.00	91.53%
Dec-99	2,777,194.00	2,561,369.00	92.23%	215,825.00	7.77%	29,794.00	2,531,575.00	91.16%

	Llamadas recibidas	Llamadas atendidas correctamente	Porcentaje de llamadas atendidas correctamente	Nota del Servicio
Jan-99	1,856,695.00	1,660,186.00	89.42%	3
Feb-99	1,771,338.00	1,605,565.00	90.64%	2
Mar-99	1,981,052.00	1,784,266.00	90.07%	2
Apr-99	1,887,723.00	1,696,814.00	89.89%	3
May-99	1,943,941.00	1,721,710.00	88.57%	3
Jun-99	2,376,791.00	1,792,832.00	75.43%	4
Jul-99	2,377,677.00	1,992,890.00	83.82%	4
Aug-99	2,389,243.00	2,199,563.00	92.06%	2
Sep-99	1,021,140.00	923,314.00	90.42%	2
Oct-99	2,516,921.00	2,259,902.00	89.79%	3
Nov-99	2,602,579.00	2,382,086.00	91.53%	2
Dec-99	2,777,194.00	2,531,575.00	91.16%	2
TOTAL	25,502,294.00	22,550,703.00	88.43%	3

Lista de notas	Nota más alta	Nota más baja
1	100	95
2	95	90
3	90	85
4	85	75
5	75	0

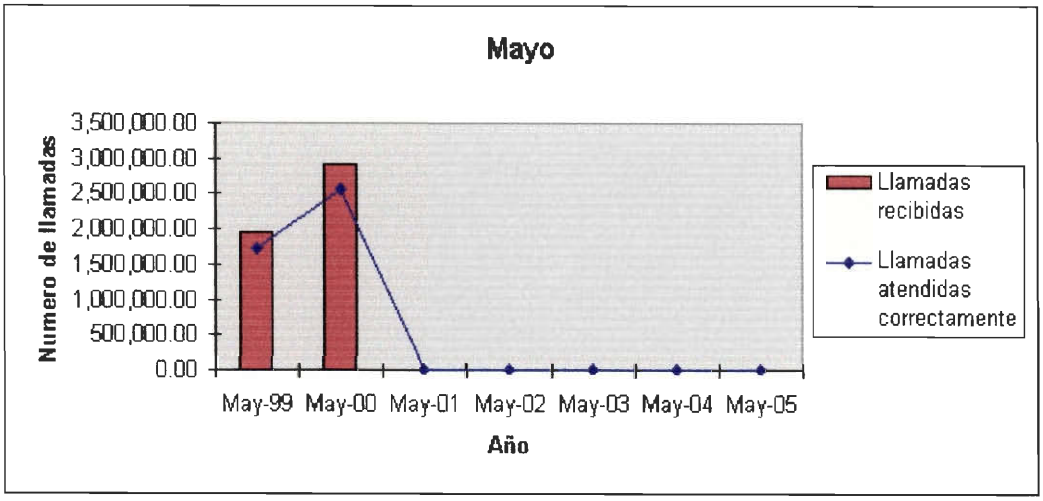
GRÁFICOS 1999





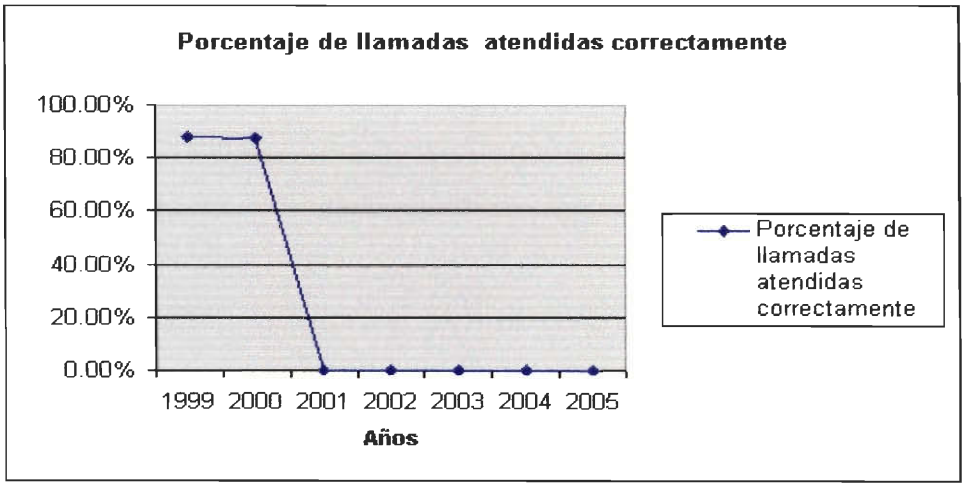
COMPARACIÓN MENSUAL MAYO

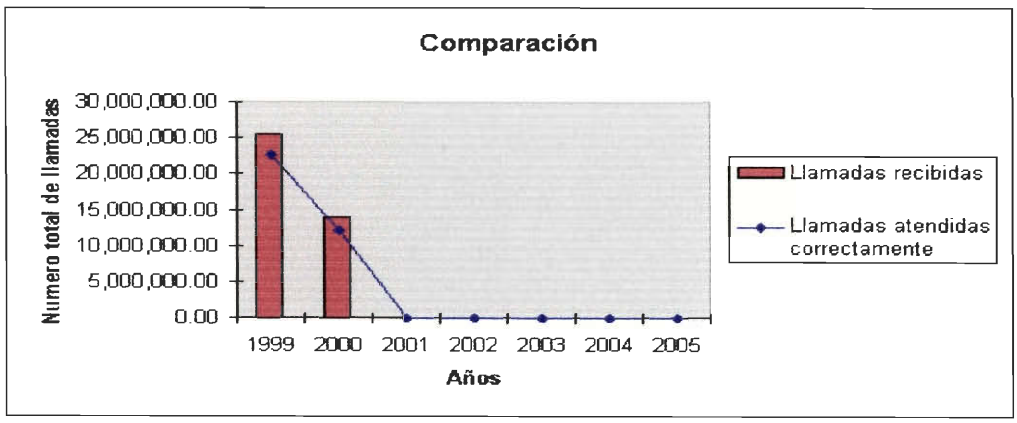
	Llamadas recibidas	Llamadas atendidas correctamente	Porcentaje de llamadas atendidas correctamente	Nota del Servicio
May-99	1,943,941.00	1,721,710.00	88.57%	**3**
May-00	2,905,331.00	2,568,003.00	88.39%	**3**
May-01	0.00	0.00	#DIV/0!	**#DIV/0!**
May-02	0.00	0.00	#DIV/0!	**#DIV/0!**
May-03	0.00	0.00	#DIV/0!	**#DIV/0!**
May-04	0.00	0.00	#DIV/0!	**#DIV/0!**
May-05	0.00	0.00	#DIV/0!	**#DIV/0!**



COMPARACIÓN ANUAL

	Llamadas recibidas	Llamadas atendidas correctamente	Porcentaje de llamadas atendidas correctamente	Nota del Servicio
1999	25,502,294.00	22,550,703.00	88.43%	**3**
2000	13,909,207.00	12,209,286.00	87.78%	**3**
2001	0.00	0.00	#DIV/0!	**#DIV/0!**
2002	0.00	0.00	#DIV/0!	**#DIV/0!**
2003	0.00	0.00	#DIV/0!	**#DIV/0!**
2004	0.00	0.00	#DIV/0!	**#DIV/0!**
2005	0.00	0.00	#DIV/0!	**#DIV/0!**





APPENDIX I MANUAL FOR PROGRAMA DE EVALUACIÓN DEL OPERADOR (PEO)

Table of Contents

DEFINICIÓN DE LA CONFIGURACIÓN DEL SISTEMA

Este programa está dividido en dos partes: "El Programa de Evaluación del Operador" y "La Base de Datos," localizada en Microsoft Access.

"El Programa de Evaluación del Operador" (PEO) está compuesto en cuatro páginas de la web. Las páginas son llamadas de: "Página de Entrada," "Página del Supervisor," "Página de Evaluación," y "Página del Administrador."

"La Base de Datos" crea tres tipos de informes: "Errores Cometidos por el Operador (Semanal)," "Número Total de Errores Cometidos (Mensual)," y "Numero Total de Cada Tipo de Error Cometido (Mensual)."

EL PROGRAMA DE EVALUACIÓN DEL OPERADOR

Las páginas de la web están configuradas para colectar la información y hacer más eficiente el proceso de evaluación de los operadores. Utilizando las páginas, se puede adicionar o borrar operadores del PEO, cambiar las claves de acceso, y tornar más rápido el proceso de evaluación. El PEO está compuesto de cuatro páginas: "Página de Entrada," "Página del Supervisor," "Página de Evaluación," y "Página del Administrador."

PÁGINA INICIAL

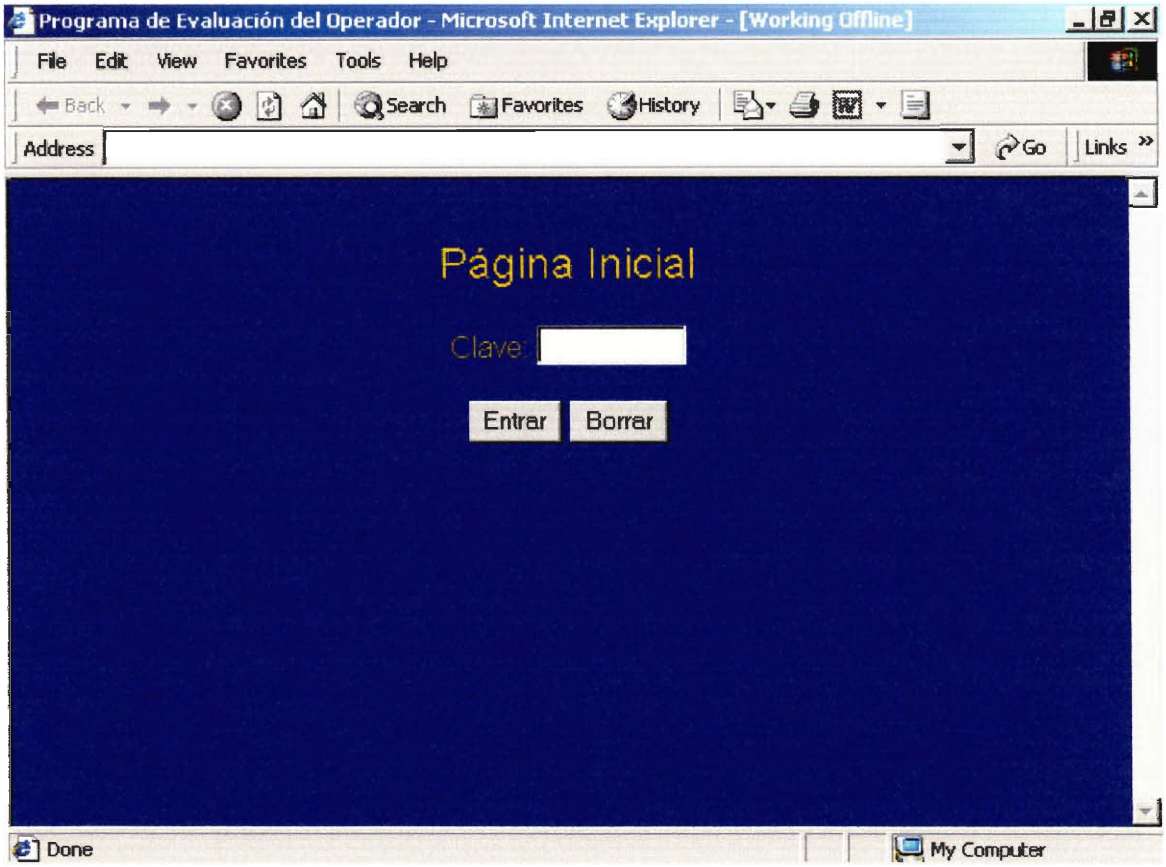


Figura I.1 Página Inicial del PEO

Esta página posibilita a las personas autorizadas (supervisores y administradores) ingresar en el PEO. Cada supervisor deberá escribir la clave en la caja respetiva. Los administradores serán los únicos que podrán hacer cambios en el sistema. Esta página es la página de entrada y salida del sistema. Se puede cliquear en el botón "Salir" para salirse del sistema.

PÁGINA DEL SUPERVISOR

Figura I.2 Página del Supervisor del PEO

Para iniciar el evaluación, seleccione el operador deseado de la lista respetiva y escriba la fecha (DD/MM/AA) de la grabación en la caja respetiva. Si se cometió algún error en la entrada de la información arriba, se puede cliquear en el botón "Borrar," y escribir la información otra vez. Cuando toda la información está escrita correctamente, cliquee en el botón "Iniciar." Si se quiere regresar a la Página Inicial, cliquee en el botón "Salir."

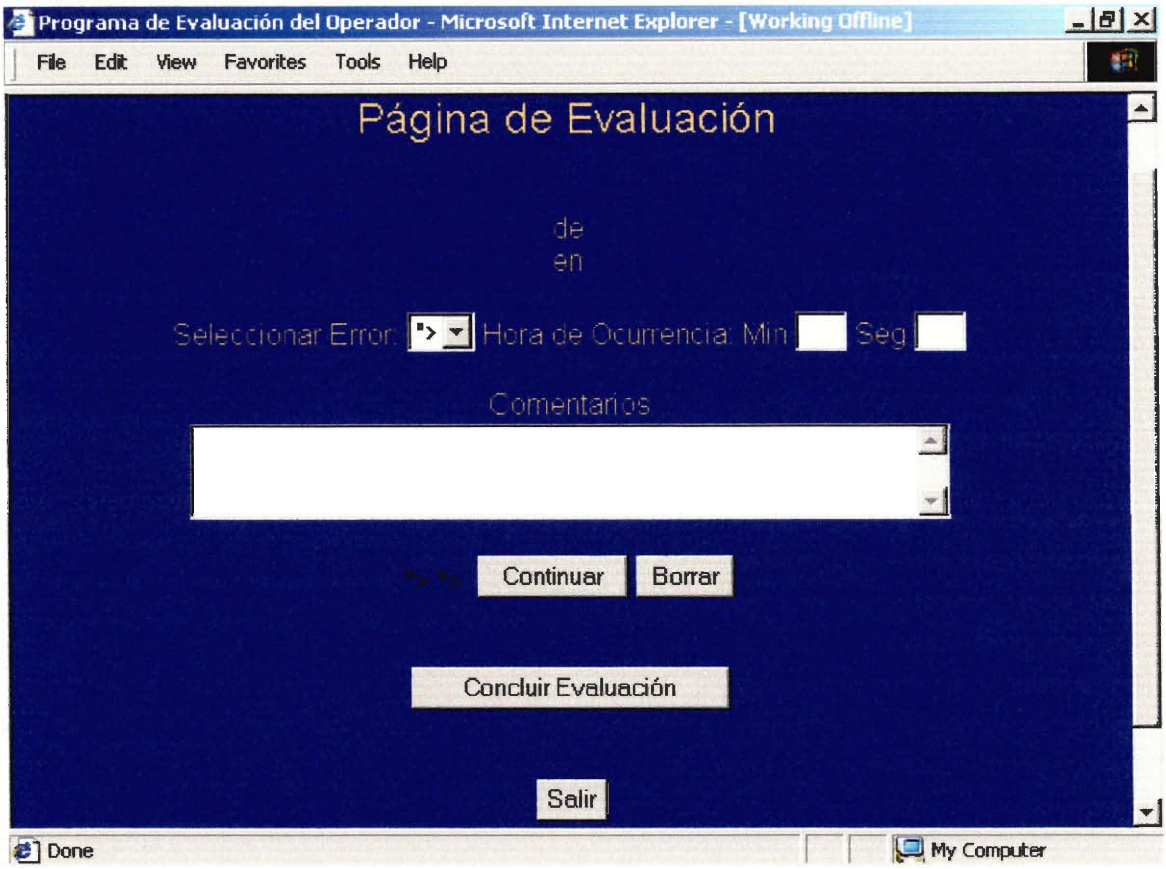


Figura I.3 Página de Evaluación del PEO

En esta página podrá verse el nombre del operador y la fecha que fueron escritos en la página anterior. En este momento se debe empezar a oír la grabación de AutoQuality (AutoQuality debe estar listo para ser usado – AutoQuality y el PEO no están conectados), y cuando el primer error ocurrir debe pausarse la grabación. En este momento, se debe seleccionar el tipo de error del menú respectivo, escribir la hora que ocurrió el error (minutos/segundos desde el principio de la grabación) en las cajas respetivas, y escribir comentarios y descripciones sobre el error en el espacio reservado

para comentarios (la caja de texto grande). Si se cometió algún error en la entrada de la información arriba, se puede cliquear en el botón "Borrar," y escribir la información otra vez. Cuando toda la información está escrita correctamente, cliquee en el botón "Continuar." *Tenga certeza de cliquear "Continuar" después de* ***cada*** *error, incluyendo el último.* Después de cliquear "Continuar" por la última vez, se puede terminar la evaluación cliqueando en el botón "Terminar Evaluación." Si se quiere regresar a la Página Inicial, cliquee en el botón "Salir."

PÁGINA DEL ADMINISTRADOR

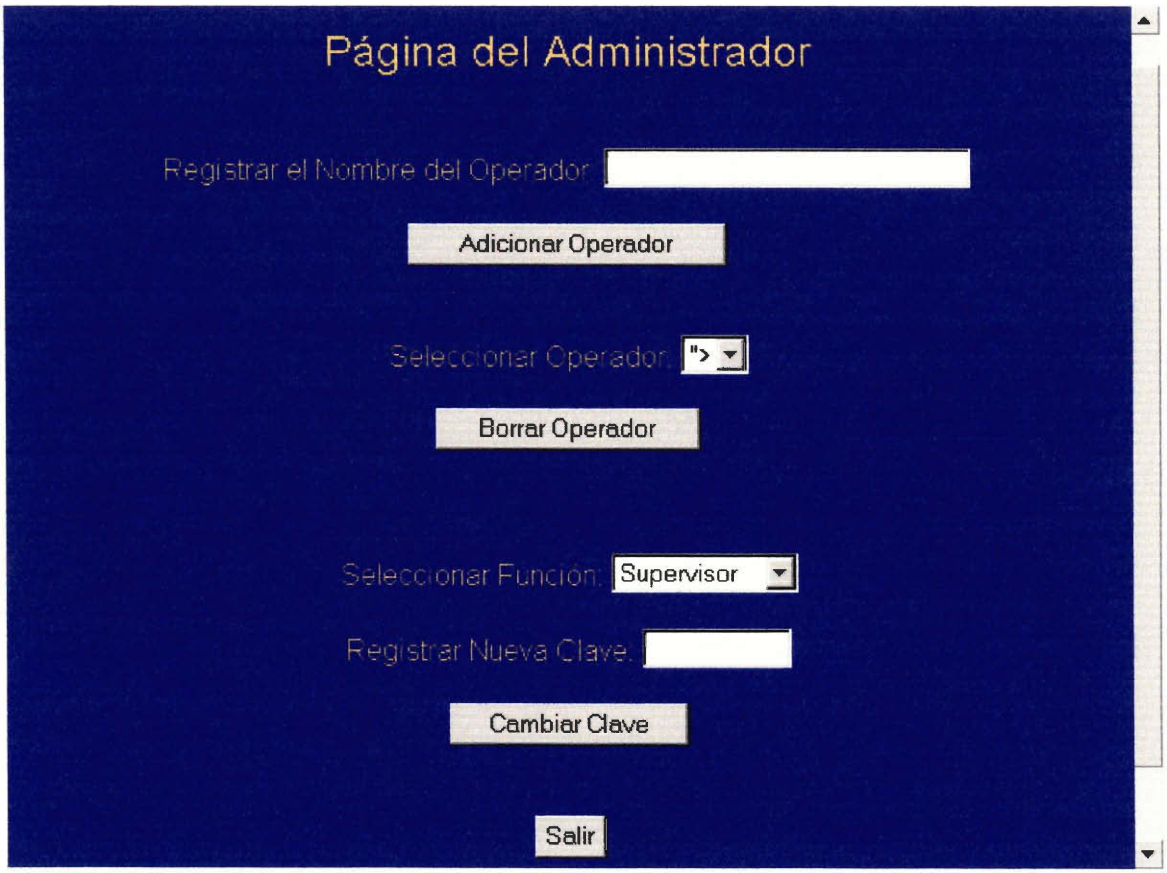


Figura I.4 Página del Administrador del PEO

En esta página puede hacerse tres cosas distintas: Adicionar un nuevo operador al sistema, borrar un operador del sistema, y cambiar la clave. Cuando todas las modificaciones han sido completadas, cliquear en el botón "Salir" para volver a la Página Inicial. ***ADVERTENCIA: ¡¡Los cambios hechos en esta página son permanentes!! ¡Tenga cuidado!***

Añadir un Operador al Sistema

Para añadir un nuevo operador al sistema, escribe el nombre del operador en la caja apropiada, llamada "Escribir el Nombre del Operador," y cliquear en el botón "Adicionar Operador."

Borrar un Operador al Sistema

Para borrar un operador del sistema, lo seleccione de la lista respetiva y cliquear en el botón "Borrar Operador."

Cambiar la Clave

Para cambiar la clave, seleccione el tipo de usuario (supervisor o administrador) de la lista apropiada. Escriba la nueva clave en la caja apropiada, llamada "Nueva Clave," y cliquear en el botón "Cambiar Clave."

LA BASE DE DATOS EN MICROSOFT ACCESS

La base de datos en Microsoft Access permite que toda la información que fue puesta en el PEO por el supervisor sea accesada por los distintos informes (Mire los ejemplos de estos informes al final del manual).

INSTRUCCIONES PARA ACCESAR EL ARCHIVO

1) Tenga un disquete con espacio libre suficiente
2) Ponga el disquete en la computadora donde la base de datos está localizada
3) Localice el archivo "database.mdb" en la computadora
4) Guarde una copia del archivo desde la computadora al disquete
5) Remueva el disquete

INSTRUCCIONES PARA MIRAR LOS INFORMES

1) Ponga el disquete en su computadora
2) Abra Microsoft Access en su computadora
3) Cliquee el menú "Archivo" y seleccione "Abrir"
4) Seleccione el archivo en el disquete y cliquee "Abrir Archivo"
5) Cliquee en el menú "Informes"
6) Seleccione el informe deseado

7) Una vez que el reporte está abierto, mueva verticalmente {SCROLL??} hacía el mes o la semana deseado

INSTRUCCIONES PARA IMPRIMIR

1) Busque el mes o la semana deseado en los informes
2) Busque los números de las páginas correspondientes
3) Cliquee en el menú "Archivos" y seleccione "Imprimir"
4) Escriba los números de las páginas que desea imprimirse en la caja "Páginas" (ej. "1-5" o "2,5,7-9,11" etc.)
5) Cliquee "Imprimir"

PROBLEMAS

A) ¿Olvidó la clave?

Si tiene una copia de la base de datos más reciente en un disquete, siga las "instrucciones para mirar los informes," arriba, números 1 hasta 4. Si no tiene una copia más reciente en un disquete, siga las "instrucciones para accesar el archivo," arriba, y después siga las "instrucciones para mirar los informes," arriba, números 1 hasta 4. Después:

1) Cliquee en el menú llamado "Tablas"
2) Abra la tabla llamada "passwords"
3) Mira las claves actuales

ID	Status	Password	Page_To_load
1	Supervisor	{la clave}	XXXXX
2	Administrador	{la otra clave}	XXXXX

Tabla I.1 La Tabla "passwords"

B) ¿Cómo cambiar la lista de errores?

Siga las instrucciones de Problema A hasta numero 3. Después:

1) Seleccione la tabla llamada "errors"

2) Adicione o borre el error deseado en la lista de errores

errorID	errorNumber	errorType
1	0	1-1
.	.	.
.	.	.
.	.	.
10	9	6-2
.	.	.
.	.	.
.	.	.
Etc	Etc.	Etc.

Tabla I.2 La Tabla "errors"

Informe de Errores de Cada Operador por Semana

Semana 07 de July de 2000

Nombre del Operador Alejandra Bonilla

Fecha	Error	Minuto	Segundos	Commentarios
7/7/2000	3-2	4	54	Commentario

Nombre del Operador Seidy Alvarado

Fecha	Error	Minuto	Segundos	Commentarios
7/6/2000	2-1	6	55	Commentario

Semana 13 de July de 2000

Nombre del Operador Alexandra Rodríguez

Fecha	Error	Minuto	Segundos	Commentarios
7/13/2000	2-6	9	43	Commentario

Nombre del Operador Roberto Rojas

Fecha	Error	Minuto	Segundos	Commentarios
7/11/2000	10-1	4	54	Commentario

Semana 02 de August de 2000

Nombre del Operador Adrian Bustamante

Fecha	Error	Minuto	Segundos	Commentarios
8/2/2000	4-1	2	43	This is a test to see if the report will generate text wrapping so that comments can be read

Número Total de Errores Por Mes

Mes *Agosto 2000*

Numero Total de Errores = 1

Mes *Julio 2000*

Numero Total de Errores = 4

APPENDIX J MANUAL FOR PROGRAMA DE CLASIFICACIÓN DEL OPERADOR (PCO)

Table of Contents

DEFINICIÓN DE LA CONFIGURACIÓN DEL SISTEMA

El Programa de Clasificación del Operador (PCO) está compuesto de doce hojas de trabajo cada una de ellas corresponde a un mes del año. Cada una de las hojas de trabajo está compuesta de tres tablas y un gráfico.

¿COMO SE DEBE HACER LA ENTRADA DE DATOS EN EL PCO?

Abra el libro de Microsoft Excel, y busque por la hoja de trabajo deseada, las hojas de trabajo son correspondientes a los meses del año, seleccione el mes deseado y abra la hoja. Cada una de las hojas de trabajo está compuesta por tres tablas y un grafico.

La primera tabla (Tabla J.1) está compuesta por ocho columnas: "Nombres, Días trabajados en el mes, Tiempo medio gasto por llamada, Número total de llamadas recibidas, Cantidad de errores, Número total de llamadas evaluadas, Número total de llamadas atendidas correctamente evaluadas, Porcentaje de llamadas atendidas correctamente evaluadas, y Nota del operador." De estas solo las columnas: "Nombres, Días trabajados en el mes, Tiempo medio gasto por llamada, Número total de llamadas recibidas, y Cantidad de errores," que están en amarillo deben ser llenadas con la información del ACD, de lo departamento de calidad, y de SITEL.

	A	B	C	D	E	F	G	H	I
1 2	**Nombre**	**Días trabajados**	**Tiempo gasto por llamada**	**Llamadas recibidas**	**Errores**	**Llamadas evaluadas**	**Llamadas atendidas correctamente**	**% de Llamadas**	**Nota del operador**
3						=D3*0.03	=F3-E3	=G3/F3	
4						=D4*0.03	=F4-E4	=G4/F4	
5						=D5*0.03	=F5-E5	=G5/F5	
6						=D6*0.03	=F6-E6	=G6/F6	
7						=D7*0.03	=F7-E7	=G7/F7	
8						=D8*0.03	=F8-E8	=G8/F8	

Tabla J.1 Tabla de Evaluación (PCO)

La segunda tabla (Tabla J.2) está compuesta de tres columnas: "Nota del operador, Nota más alta, y Nota más baja." Está tabla muestra cómo el ranqueo está dividido, y cuál es la nota media, la máxima y la mínima. Para buscar cuáles son las notas máxima, mínima y media alcanzadas por los operadores debe usar las fórmulas de Excel representadas en la Tabla J.2

	K	L	M
4	**Lista de notas**	**Nota más alta**	**Nota más baja**
5	**A**	100	100
6	**B**	100	99.4
7	**C**	99.4	98
8	**D**	98	95
9	**E**	95	0
10	**Media**	=MEDIA( )	**C**
11	**Máxima**	=MAX( )	**A**
12	**Mínima**	=MIN( )	**D**

Tabla J.2 Tabla de Notas (PCO)

La tercera tabla (Tabla J.3) está compuesta por cuatro columnas: "Categoría, Número, Porcentaje, y Resultado." Está tabla muestra un resumen de cómo los

operadores están divididos en los niveles. Para calcular esto debiese clasificar la Tabla J.1 por la columna I y aplicar la fórmula de subtotal como está representado en la Tabla J.3.

	K	L	M	N
15	**Categoría**	**Número**	**Porcentaje**	**Resultado**
16	Excelente	=SUBTOTAL ( )	=L16/L21	=M16
17	Bueno	=SUBTOTAL ( )	=L17/L21	
18	Aceptable	=SUBTOTAL ( )	=L18/L21	=M18
19	Pobre	=SUBTOTAL ( )	=L19/L21	
20	Inaceptable	=SUBTOTAL ( )	=L20/L21	=M20
21	**Total**	=SUM(L16:L21)	=SUM(M16:M21)	

Tabla J.3 Distribución de Operadores en Categorías (PCO)

Figura J.1 muestra la información que está resumida en la Tabla J.3, para una mejor visualización.

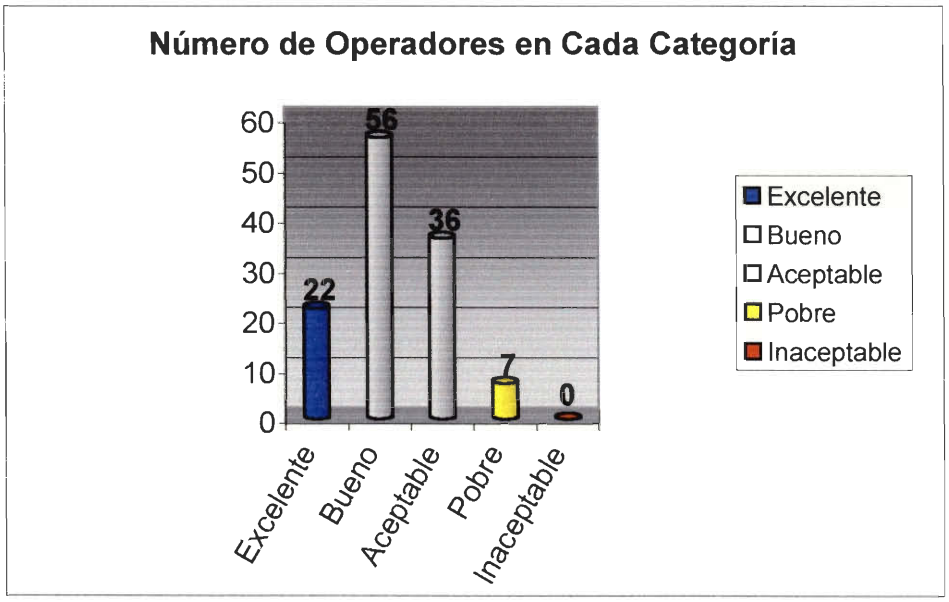


Figura J.1 Número de Operadores en Cada Categoría (PCO)

APPENDIX K ASP CODE FOR PROGRAMA DE EVALUACIÓN DEL OPERADOR

PÁGINA INICIAL (index.asp)

```
<%
Response.Expires = -1
Response.AddHeader "Pragma", "no-cache"
Response.AddHeader "cache-control","no-store"

If Request.Form("Submit") = "Login" Then
        DatabaseLocation = "c:\asp\test\database.mdb"
        Set conn = Server.CreateObject("ADODB.Connection")
           conn.Open "PROVIDER=MSDASQL;" & _
                  "DRIVER={Microsoft Access Driver (*.mdb)};" & _
                  "DBQ=" & DatabaseLocation & ";"
        sql = "SELECT Password, Page_To_Load FROM passwords WHERE Password
= '" & Request.Form("password") & "'"
        set rs = conn.Execute (sql)
        If rs.eof then
                Response.Write "<center><h3><font color='FFD700'>Invalid
Password</font></h3>"
        Else
                Session.Value("authenticated") = "TRUE"
                Response.Redirect rs("Page_To_Load")
        End If
End If

%>

<html>
<head>
<title>Programa de Evaluación del Operador</title>
</head>
<body bgcolor="00008B">
<center>
<br>
<font face="Arial" size="+2" color="FFD700">Página Inicial</font>
<br>
<br>
<form method="post" action="index.asp">
<font face="Arial" color="FFD700">Clave:</font>
<input type="password" name="password" size="10" maxlength="8">
<br>
<br>
```

```
<input type="Submit" name="Submit" value="Entrar">
<input type="Reset" value="Borrar">
</form>
</center>
</body>
</html>

<%Conn.Close%>
```

PÁGINA DEL SUPERVISOR (supervisor.asp)

```
<%
Response.Expires = -1
Response.AddHeader "Pragma", "no-cache"
Response.AddHeader "cache-control","no-store"

If Session.Value("authenticated") <> "TRUE" Then

        Session.Value("authenticated") = "NOT"
        Response.Redirect "index.asp"

End If

DatabaseLocation = "c:\asp\test\database.mdb"
Set conn = Server.CreateObject("ADODB.Connection")
   conn.Open "PROVIDER=MSDASQL;" & _
          "DRIVER={Microsoft Access Driver (*.mdb)};" & _
          "DBQ=" & DatabaseLocation & ";"

If Request.Form("Submit") = "Log Out" Then
        Session.Value("authenticated") = false
        Response.Redirect "index.asp"
End If

sql = "SELECT * FROM operators ORDER BY Operator_Name"
set rs = conn.Execute (sql)

If Request.QueryString("Invalid") <> "" Then
        Response.Write "<center><h3><font color='FFD700'>The Date you entered is
not valid!</font></h3>"
End If
%>
```

```
<html>
<head>
<title>Programa de Evaluación del Operador</title>
</head>
<body bgcolor="00008B">
        <center>
<br>
        <font face="Arial" size="+2" color="FFD770">Página del Supervisor</font>
        <form method="post" action="evaluation.asp">
<br>
        <font face="Arial" color="FFD770">Seleccionar Operador:</font>
                <select name="ID" size="1">
                <%do until rs.eof%>
                <option value="<%=rs("opID")%>"><%=rs("Operator_Name")%>
                </option>
                <%rs.movenext
                  loop%>
                </select>
<br>
<br>
        <font face="Arial" color="FFD770">Fecha (DD/MM/AA):</font>
                <input type="text" name="day" size="1" maxlength="2">
        <font face="Arial" color="FFD770">/</font>
                <input type="text" name="month" size="1" maxlength="2">
        <font face="Arial" color="FFD770">/</font>
                <input type="text" name="year" size="1" maxlength="2">
<br>
<br>
                <input type="submit" value="Iniciar Evaluación">
                <input type="reset" value="Borrar">
        </form>
<br>
<br>
        <form method="post" action="index.asp">
                <input type="submit" name="Submit" value="Salir">
        </form>
</body>
</html>

<%Conn.Close%>
```

PÁGINA DE EVALUACIÓN (evaluation.asp)

```
<%
Response.Expires = -1
Response.AddHeader "Pragma", "no-cache"
Response.AddHeader "cache-control","no-store"

If Session.Value("authenticated") <> "TRUE" Then

        Session.Value("authenticated") = "NOT"
        Response.Redirect "index.asp"

End If

DatabaseLocation = "c:\asp\test\database.mdb"
Set conn = Server.CreateObject("ADODB.Connection")
   conn.Open "PROVIDER=MSDASQL;" & _
          "DRIVER={Microsoft Access Driver (*.mdb)};" & _
          "DBQ=" & DatabaseLocation & ";"

If Request.Form("Submit") = "Continue" Then
        sqlError = "INSERT INTO errorsmade (Operator, [Date], Error, Minutes,
Seconds, Comment) VALUES ('" & Request.Form("Operator") & "', #" &
Request.Form("Date") & "#, '" & Request.Form("Error") & "', " &
Request.Form("Minutes") & ", " & Request.Form("Seconds") & ", '" &
Request.Form("Comment") & "')"
        conn.Execute (sqlError)
ElseIf Request.Form("Submit") = "Log Out" Then
        Session.Value("authenticated") = false
        Response.Redirect "index.asp"
Else
        DateString = Request.Form("Month") & "/" & Request.Form("Day") & "/" &
Request.Form("Year")
        If Not IsDate(DateString) Then
                Response.Redirect "supervisor.asp?Invalid=Date"
        End If
End If

If DateString = "" Then
        DateString = Request.Form("Date")
End If

sql = "SELECT * FROM operators WHERE ID = " & Request.Form("ID")
set rs = conn.Execute (sql)
```

```
%>

<html>
<head>
<title>Programa de Evaluación del Operador</title>
</head>
<body bgcolor="00008B">
<br>
        <center>
        <font face="Arial" size="+2" color="FFD770">Página de Evaluación</font>
        <form method="post" action="evaluation.asp">
<br>
        <font face="Arial" color="FFD770">de
<b><%=rs("Operator_Name")%></b></font>

<br>
        <font face="Arial" color="FFD770">en <b><%=DateString%></b></font>

<br>
<br>
        <font face="Arial" color="FFD770">Seleccionar Error:</font>
                <select name="Error" size="1">
                <%do until rs.eof%>
                <option value="<%=rs("errorID")%>"><%=rs("errorType")%>
                </option>
                <%rs.movenext
                  loop%>
                </select>
        <font face="Arial" color="FFD770">Hora de Ocurrencia: Min</font>
                <small><input name="Minutes" size="1" maxlength="2"></small>
        <font face="Arial" color="FFD770">Seg</font>
                <small><input name="Seconds" size="1" maxlength="2"></small>
<br>
<br>
        <font face="Arial" color="FFD770">Comentarios</font>
<br>
                <textarea name="Comment" rows="3" cols="50"></textarea>
<br>
<br>
                <input type="hidden" name="ID" value="<%=rs("opID")%>">
                <input type="hidden" name="Operator"
                value="<%=rs("Operator_Name")%>">
                <input type="hidden" name="Date" value="<%=DateString%>">
                <input type="submit" name="Submit" value="Continuar">
                <input type="reset" value="Borrar">
```

```
        </form>
<br>
        <form method="post" action="supervisor.asp">
                <input type="submit" value="Concluir Evaluación">
        </form>
<br>
        <form method="post" action="index.asp">
                <input type="submit" name="Submit" value="Salir">
        </form>
        </center>
<br>
</body>
</html>

<%Conn.Close%>
```

PÁGINA DEL ADMINISTRADOR (administrator.asp)

```
<%
Response.Expires = -1
Response.AddHeader "Pragma", "no-cache"
Response.AddHeader "cache-control","no-store"

If Session.Value("authenticated") <> "TRUE" Then

        Session.Value("authenticated") = "NOT"
        Response.Redirect "index.asp"

End If

DatabaseLocation = "c:\asp\test\database.mdb"
Set conn = Server.CreateObject("ADODB.Connection")
   conn.Open "PROVIDER=MSDASQL;" & _
          "DRIVER={Microsoft Access Driver (*.mdb)};" & _
          "DBQ=" & DatabaseLocation & ";"

If Request.Form("Submit") = "Add Operator" and Request.form("name") <> "" Then
        sqlAdd = "INSERT INTO operators (Operator_Name) VALUES ('" &
Request.Form("NAME") & "')"
        conn.Execute (sqlAdd)
ElseIf Request.Form("Submit") = "Delete Operator" Then
        sqlDelete = "DELETE FROM operators WHERE opID = " &
Request.Form("Operator")
```

```
        conn.Execute (sqlDelete)
ElseIf Request.Form("Submit") = "Change Password" Then
        sqlChange = "UPDATE passwords SET Password = '" &
Request.Form("Password") & "' WHERE Status = '" & Request.Form("Status") & "'"
        conn.Execute (sqlChange)
ElseIf Request.Form("Submit") = "Log Out" Then
        Session.Value("authenticated") = false
        Response.Redirect "index.asp"
End If

sql = "SELECT * FROM operators ORDER BY Operator_Name"
set rs = conn.Execute (sql)
%>

<html>
<head>
        <title>Programa de Evaluación del Operador</title>
</head>
<body bgcolor="00008B">

<center>
<br>
<font face="Arial" size="+2" color="FFD770">Página del Administrador</font>
<br>
<br>
<br>

<form method="post" action="administrator.asp">
<font face="Arial" color="FFD770">Registrar el Nombre del Operador:</font>
<input type="text" name="NAME" size="30">
<br>
<br>
<input type="Submit" name="Submit" value="Adicionar Operador">
</form>
<br>

<form method="post" action="administrator.asp">
<font face="Arial" color="FFD770">Seleccionar Operador:</font>
        <select name="Operator" size="1">
                <%do until rs.eof%>
                <option value="<%=rs("opID")%>"><%=rs("Operator_Name")%>
                </option>
                <%rs.movenext
                  loop%>
        </select>
```

```
        <br>
        <br>
        <input type="Submit" name="Submit" value="Borrar Operador">
</form>

<br>
<br>
<form method="post" action="administrator.asp">
<font face="Arial" color="FFD770">Seleccionar Función:</font>
        <select name="Status" size="1">
                <option value="Supervisor">Supervisor</option>
                <option value="Administrator">Administrator</option>
        </select>
<br>
<br>
        <font face="Arial" color="FFD770">Registrar Nueva Clave:</font>
        <input type="password" name="password" size="10" maxlength="8">
<br>
<br>
        <input type="Submit" name="Submit" value="Cambiar Enclave">
</form>
<br>

<form method="post" action="index.asp">
        <input type="submit" name="Submit" value="Salir">
</form>

</center>
<br>
</body>
</html>

<%Conn.Close%>
```

Note: All italicized parts of the code were completed by Jon Magnussen, currently a Junior at Worcester Polytechnic Institute. The remainder was written by the project group.

APPENDIX L RESUMEN EJECUTIVO (EXECUTIVE SUMMARY IN SPANISH)

El Servicio de Información 113 es un servicio para solicitar números de teléfonos, provisto por el Instituto Costarricense de Electricidad (ICE). Los clientes del Servicio (el público costarricense) pueden llamar al Servicio y pedir números de teléfono residenciales, comerciales, públicos, y gubernamentales. Las llamadas son recibidas en el Servicio por los 150 operadores que trabajan allí. Los operadores trabajan en 15 turnos alternados y reciben aproximadamente 2,6 millones de llamadas cada mes. El desempeño de los operadores es evaluado cada semana por el Departamento de Control de Calidad del Servicio.

Cuando comenzamos nuestro estudio, el Servicio tenía varios problemas: su sistema de evaluación era inadecuado, los operadores estaban descontentos con varios aspectos del Servicio, y el Servicio quería tener un método para evaluar su desempeño y el desempeño de sus operadores. Con la posibilidad de privatización del ICE, el Servicio de Información 113 estaba preocupado por la calidad del servicio que estaba ofreciendo a la gente de Costa Rica. Por estas razones, la Ing. Katia Arana Puente, Jefa del Servicio, comisionó al grupo del proyecto para buscar soluciones a los problemas descritos arriba.

Durante el proyecto, el equipo de los estudiantes de Worcester Polytechnic Institute tenía una meta principal: mejorar el sistema de evaluación del Servicio sin sacrificar la calidad del servicio provisto a sus clientes. Por eso, los estudiantes desarrollaron tres objetivos principales. Los dos primeros objetivos eran crear un sistema de clasificación del Servicio en general y crear un sistema similar para clasificar el desempeño de los operadores. Para ambos objetivos, había un objetivo secundario, que

era crear un método para duplicar los sistemas de clasificación. El tercer objetivo del proyecto era crear un sistema de evaluación mejor y automático para los supervisores del Servicio.

El equipo de estudiantes desarrolló un sistema de clasificación de los operadores del Servicio basado en el número de llamadas atendidas correctamente (sin error). El sistema produjo una distribución del "Bell-Curve" de los operadores; clasificó a 121 operadores, de cuales solamente seis obtuvieron un desempeño "pobre" y veintidós obtuvieron un desempeño "excelente." Los operadores, en su promedio, obtuvieron un nivel de desempeño entre "bueno" y "aceptable." Los resultados del sistema fueron colocados en una hoja de trabajo de Microsoft Excel (presentado al Servicio electrónicamente), que se puede modificar o usar de nuevo para futuras clasificaciones. Además, un manual fue creado y presentado al Servicio que explica el uso y modificación del sistema.

El grupo también desarrolló un sistema de clasificación del Servicio, de una manera similar a lo creado para los operadores. El sistema provee clasificaciones mensuales y anuales del Servicio. Para 1999 y los primero seis meses de 2000, el Servicio obtuvo un desempeño "aceptable." Estos resultados también fueron colocados en una hoja de trabajo de Microsoft Excel, en que se puede ver el desempeño mensual y anual del Servicio. Igualmente puede obtenerse comparaciones mensuales y anuales. Un manual fue creado y presentado al Servicio que explica el uso y modificación del sistema.

Para mejorar el sistema actual de evaluación de los operadores, los estudiantes desarrollaron un programa, basado en la Web, para evaluaciones. Este sistema reemplazaría los actales métodos manuales de evaluación y creación de reportes. El

programa está conectado a una base de datos de Microsoft Access, que crea automáticamente informes sobre errores y evaluaciones. Actualmente, el programa está completo, pero necesita ser instalado en la Intranet del Servicio. El grupo del proyecto no tiene el conocimiento necesario para hacerlo, pero la instalación puede ser hecha fácilmente y rápidamente por una persona que tenga conocimiento de la Intranet.

Finalmente, los estudiantes del proyecto presentaron una serie de recomendaciones sobre el programa de capacitación, el desempeño del Servicio y de los operadores, y las condiciones de trabajo de los supervisores y operadores. Las recomendaciones completas y las conclusiones del proyecto están incluidas en dos idiomas, inglés y español, en este reporte. Estas recomendaciones y conclusiones fueron presentadas al Servicio, con la expectativa de que su implementación permita que el Servicio de Información 113 ofrezca un mejor servicio a la gente costarricense.

APPENDIX M PRESENTACIÓN Y ANÁLISIS DE DATOS

Antes que recomendaciones sean creadas y presentadas para el Servicio de Información 113, los datos recolectados en el periodo de ocho semanas y los resultados obtenidos en este proyecto deben ser analizados. Los resultados de las diferentes partes del reporte son representados en este Capítulo, donde la información contenida en los resultados fue interpretada y revisada. El primer conjunto de datos analizado fue los resultados de la entrevista distribuida a los operadores del Servicio de Información 113.

4. 1 RESULTADOS DE LA ENTREVISTA DEL OPERADOR

Cuando un número suficiente de entrevistas (ver Apéndice C) fue devuelto al grupo del proyecto, (a cause del hecho que algunos operadores estaban de vacaciones y otros estaban en capacitación, fueran devolvías sólo 75 de las 150 entrevistas distribuidas), el grupo compiló los resultados en una hoja de trabajo del Microsoft Excel (ver Apéndice E). Los resultados de las preguntas donde más información podía ser extraída fueron investigados totalmente, y el gráfico y análisis escrito de los resultados están presentados en esta Sección.

4.11 Preguntas de Selección Múltiple

El primer conjunto de preguntas que el grupo analizó fue el de las preguntas de selección múltiple (ver Sección 3.11). Las repuestas de los operadores fueran asomadas y la media de las repuestas fue calculada. Los resultados en esta Sección incluyen los resultados de la entrevista experimental, con la excepción de que está escrito específicamente al contrario, porque solamente una de las preguntas de la entrevista experimental fue cambiada cuando la entrevista final fue creada.

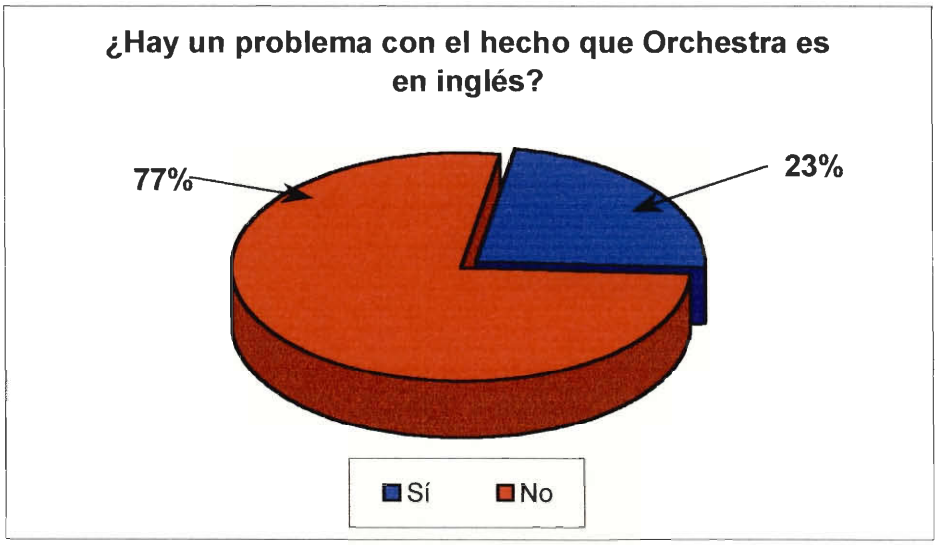


Figura 4.1 Pregunta Sobre Problemas con Orchestra En Inglés

La primera pregunta que el grupo analizó fue si hay algún problema con el hecho que el programa Orchestra, (usado por los operadores todos los días), es en inglés. Sólo uno de los 75 operadores entrevistados no contestó la pregunta. Los resultados mostrados en Figura 4.1, arriba, indican el porcentaje del resto de las 74 respuestas. Al principio

parece que una gran mayoría de los operadores no tiene problema con que el programa Orchestra sea en inglés. Este hecho actualmente es verdad, pero en realidad es el grupo de operadores que están preocupados con este problema del idioma que fue considerado más importante para el grupo del IQP. Prácticamente todos los operadores sólo hablan español, y tienen que utilizar un programa en que el menú y los campos están en inglés, algo que ciertamente es molesto e innecesario. El hecho que casi un cuarto de los operadores entrevistados tiene problemas con el programa Orchestra en inglés representa una circunstancia que debe ser sobrescrita. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.1.

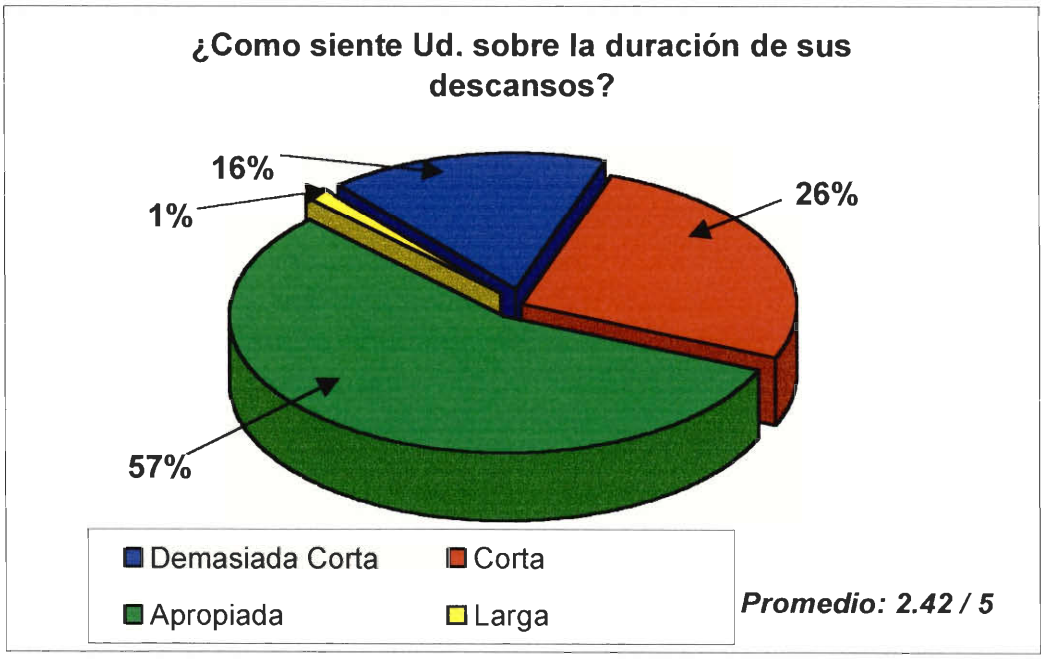


Figura 4.2 Pregunta Sobre la Duración de los Descansos

Un aspecto importante que los estudiantes del IQP esperaban entender mejor de los resultados de la entrevista era si los operadores estaban siendo tratado de una manera

justa. La labor del operador es monótona y sedentaria; por esa razón sus descansos son momentos importantes de relajamiento. El grupo esperaba entender como los operadores se sentían sobre la duración y la frecuencia de los descansos. Solamente dos de los 75 operadores entrevistados no contestaron esta pregunta. De Figura 4.2, puede verse claramente que más de la mitad de los operadores sienten que los descansos son apropiados. Pero, más del 40% de los operadores entrevistados (colores rojo y azul en el gráfico), quieren que los descansos sean más largos. El promedio de las respuestas mostradas en Figura 4.2 (Ver Apéndice C por respuestas posibles), demuestra este mismo sentimiento. Se parece que la mayoría de los operadores estan satisfechos con la duración de los descansos, y sólo una pequeña minoría siente que los descansos deberían ser más largos. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.1.

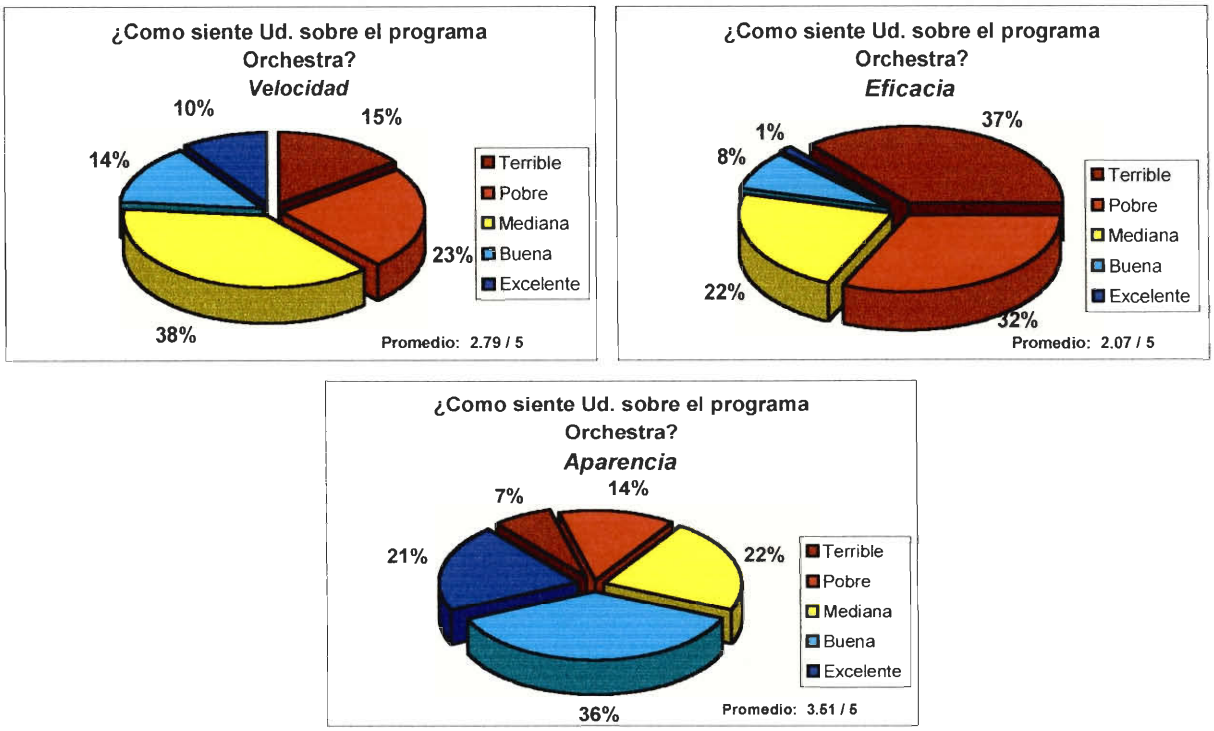


Figura 4.3 Opiniones de los Operadores Sobre Orchestra

Como se mencionó anteriormente, los operadores del Servicio de Información 113 usan un programa llamado Orchestra, un programa que busca datos en una base. Desde que los operadores usan el programa todos los días, y cuentan con su eficiencia y efectividad para desempeñar su función, pareció importante para el grupo entender lo que los operadores sentían sobre el programa. Esta sección de la entrevista fue dividida en tres diferentes preguntas sobre la velocidad, eficiencia, y apariencia del programa Orchestra. De las 75 respuestas, 73, 72 y 73 operadores, respectivamente, contestaron a estás preguntas. Las repuestas pueden ser vistas en Figura 4.3, arriba.

La distribución de las respuestas para la pregunta sobre velocidad es prácticamente igual, con la mayoría de los operadores sintiendo que la velocidad del

programa es mediocre. Esta distribución nos da un promedio de 2.79, que significa que la respuesta está entre "pobre" y "mediana." Desde que los operadores cuentan con la velocidad del programa Orchestra para rápidamente proceder con las búsquedas para el cliente, está respuesta es significativa y debe ser apuntada para el Servicio. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.1.

La distribución de las respuestas para la pregunta sobre eficacia fue más variada, y pueden ser vistas en Figura 4.3. 69% de los operadores que contestaron esta pregunta dijeron que la eficacia del programa es "pobre" o "terrible." Solamente 9% de los operadores dijeron que la eficacia del programa es "buena" o "excelente." Esta distribución tuvo un promedio de 2.07, o "pobre." A cause del hecho que hay una serie de problemas técnicos con el programa Orchestra (ver sección 2.3132), estas respuestas no son sorprendentes. Pero, es extremamente importante notar que más del 90% de los operadores entrevistados sienten que la eficacia del programa que usan todos los días es solamente mediocre. Las recomendaciones sobre este aspecto serán encontradas en la Sección 5.4.

La distribución de las respuestas sobre la pregunta sobre apariencia es mucho más favorable al programa. Más del 55% de los operadores contestaron esta pregunta con "buena" o "excelente," resultando en un promedio de 3.51, entre "buena" y "mediana." La apariencia del programa no fue tan importante como la velocidad o la eficacia, pero el grupo del proyecto entendió que así mismo podría afectar la opinión de los operadores sobre el programa (ver sección 2.3132). Existía una pequeña posibilidad de cambio en la apariencia del sistema, pero desde que la opinión media del operador fue positiva, no fueron hechas recomendaciones para el servicio sobre ese aspecto.

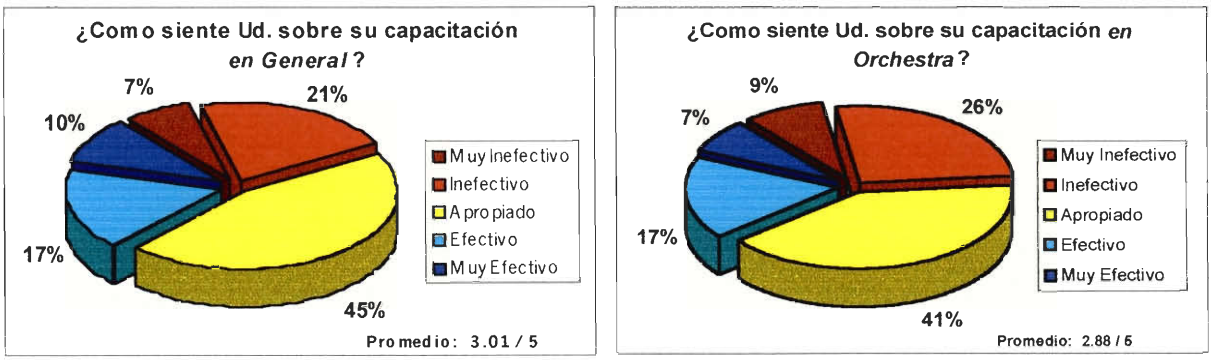


Figura 4.4 Preguntas Sobre Capacitación

¿Capacitación es un aspecto muy importante del desempeño del operador. Si el operador fue bien capacitado, su desempeño reflejará este beneficio. En la misma forma, si la capacitación fue ineficiente, el desempeño será impactado negativamente. De los 75 operadores entrevistados, 71 respondieron la pregunta sobre la capacitación en general, y 69 respondieron la cuestión sobre la pregunta en el programa Orchestra.

La distribución de las respuestas sobre la capacitación en general muestra una distribución de "Bell-Curve" con prácticamente la mitad de los operadores que dijeron que la capacitación es "apropiada." La respuesta media fue 3.01, o "apropiada." Este promedio no fue una sorpresa porque el Servicio no mencionó problemas con la capacitación, pero las respuestas todavía muestran que la capacitación puede ser mejorada. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.1.

La distribución de las respuestas para la pregunta sobre la capacitación en el programa Orchestra es muy similar esta de la pregunta anterior, sobre la capacitación en general; pero había más respuestas de "inefectiva" y "muy inefectiva." El promedio es 2.88 lo cuál refleja esta diferencia. Este factor fue llevado a consideración cuando las recomendaciones generales fueron creadas sobre la capacitación.

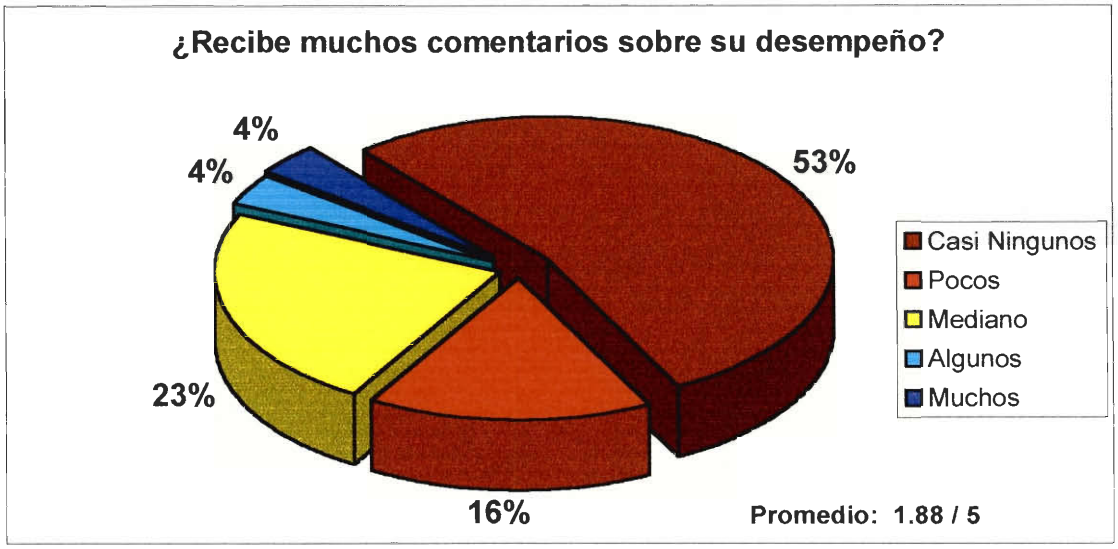


Figura 4.5 Pregunta Sobre Comentarios sobre Desempeño

Para un operador es importante entender completamente su desempeño, y lo que debe ser cambiado; los supervisores deben proveer el operador con una cantidad adecuada de comentarios sobre su desempeño. El grupo del proyecto decidió dejar la pregunta sobre comentarios sobre su desempeño para ser la ultima de las preguntas de selección múltiple para ser evaluada y analizada. A causa del hecho que esta pregunta fue ambigua en la entrevista experimental, las respuestas de los operadores de la entrevista experimental fueron omitidas de los resultados finales. Por eso solamente 56 de las 75 entrevistas están representadas en el gráfico, Figura 4.5. Aun así, puede verse que más del 50% de los operadores que contestaron la pregunta dijeron que reciben "casi ningunos" comentarios sobre su desempeño. Las dos mejores respuestas, "muchos" y "algunos" combinadas sólo representan 8% del resultado final. En Figura 4.5 se puede ver que este es un gran problema para los operadores y una que necesita ser resuelta inmediatamente. La respuesta media fue 1.88, entre "casi ninguns"o y pocos," lo que

comprueba este hecho también. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.1

4.12 Preguntas Descriptivas

Como puede ser visto en el Apéndice C, existen dos tipos de preguntas descriptivas en la entrevista del operador, en que el operador fue solicitado para proveer sugerencias y recomendaciones sobre la capacitación y sugerencias generales, respectivamente. Estas respuestas no pudieron ser compiladas por cantidad pero las respuestas más frecuentes pudieron ser resumidas en un gráfico para mejor visualización.

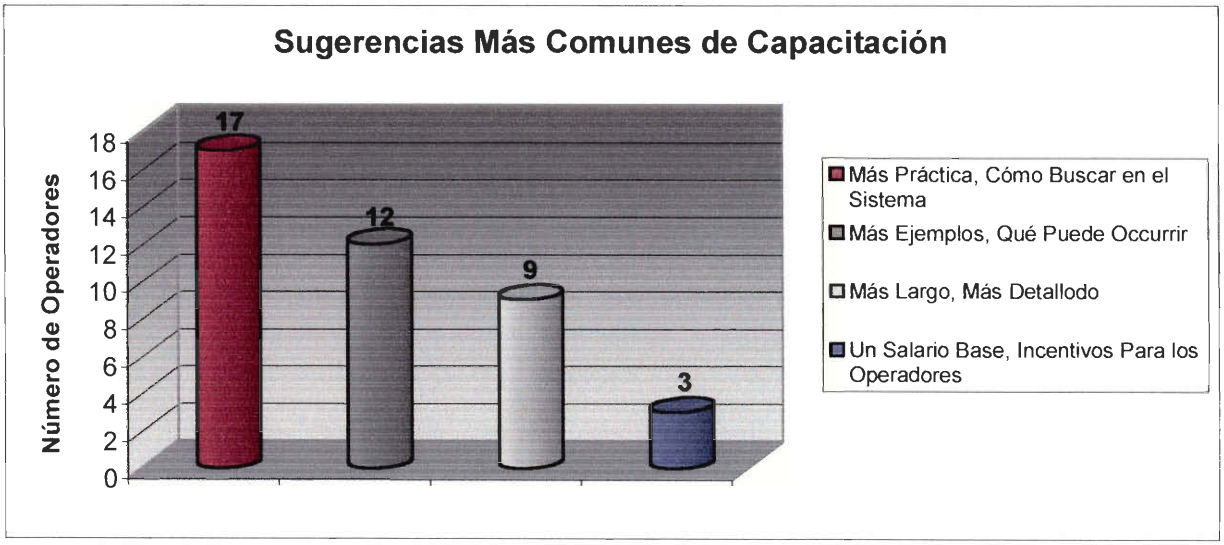


Figura 4.6 Sugerencias Más Comunes de Capacitación

A causa del hecho que la calidad de la capacitación que el operador recibe puede dictar la calidad del desempeño del operador, el grupo decidió que era necesario entender los sentimientos de los operadores sobre la capacitación y sugerencias sobre cómo

mejorarla. De los 75 operadores entrevistados, 54 contestaron la pregunta. Este número es pequeño, pero no fue una sorpresa porque preguntas descriptivas requiren tiempo para ser contestadas y el tiempo de los operadores es extremamente importante. De todas las respuestas, cuatro representan las mayores preocupaciones y pueden ser vistas en Figura 4.6. Las tres primeras respuestas en Figura 4.6 están relacionadas con la capacitación, y sugieren más práctica con el programa, y ejemplos de vida real. Solo una de las sugerencias que se ve en Figura 4.6 está relacionada con el dinero. Nueve de los operadores que contestaron la entrevista desean tener un salario base para los dos primeros meses de trabajo y una recompensa monetaria para los operadores que desempeñaren su función sin errores. Ningunas de las respuestas representó más del 35% del total, pero los estudiantes percibieron que los operadores dieron sugerencias muy importantes. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.1.

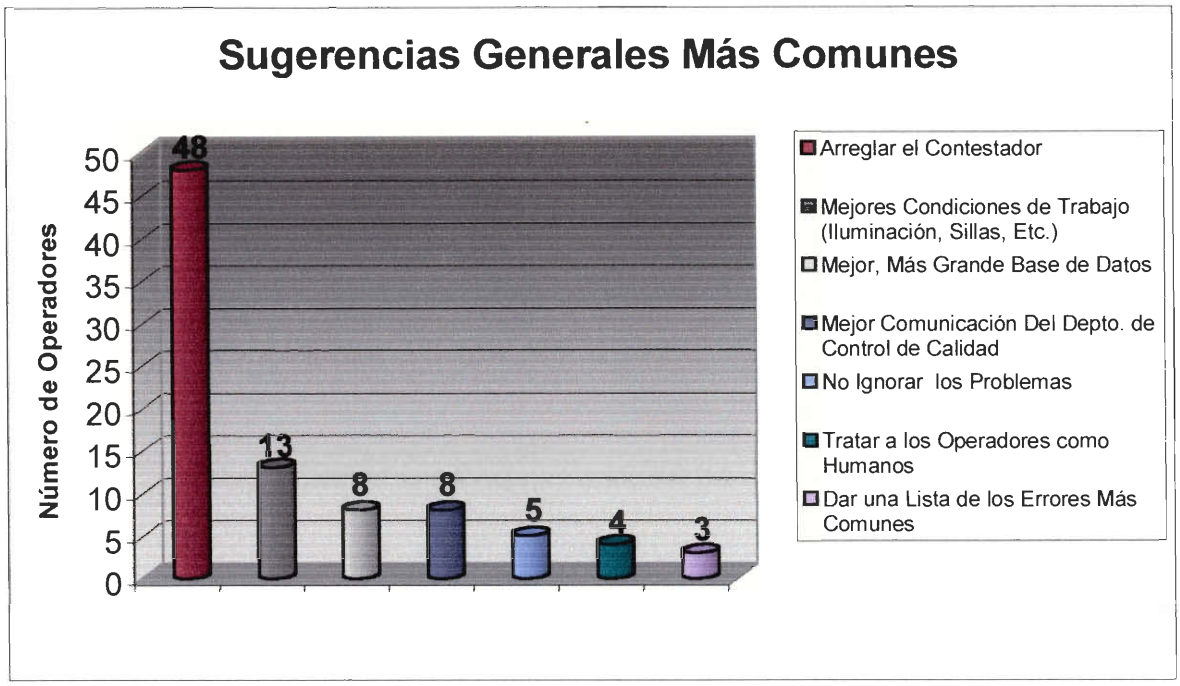


Figura 4.7 Sugerencias Generales Más Comunes

Además de las sugerencias sobre cómo mejorar la capacitación, los operadores también fueron solicitados para dar recomendaciones o sugerencias generales. De los 75 operadores entrevistados, 64 de ellos respondieron esta pregunta. Las respuestas más comunes pueden ser encontradas en Figura 4.7. Un alarmante 75% de los operadores que respondieron a esta pregunta pedieron para que el programa Orchestra tenga el contestador arreglado. El grupo del proyecto y el Servicio de Información 113 estaban bien informados que había un problema con el contestador y el gran numero de personas que lo mencionó no fue una sorpresa. Pero 75% de los operadores específicamente reclamando sobre ese problema muestra los sentimientos malos de los sobre el sujeto. Un gran número de operadores mencionó que este problema está influenciando la calidad del servicio ofrecido.

Las otras recomendaciones eran para mejorar las condiciones de trabajo (cambiar la iluminación en la Sala del Operador, cambiar las sillas, etc.) y mejoramiento del equipo usado por los operadores. Dos respuestas sorprendieron: respuestas de "tratar operadores como seres humanos" y "parar de ignorar los problemas"indican la necesidad urgente de atención a los operadores. Si los operadores sienten que están recibiendo atención y que son importantes para el servicio la motivación los hará sentir que siempre pueden hacerlo mejor. El grupo del proyecto sintió que los operadores saben que su trabajo es de mucha importancia para el Servicio de Información 113 y para las personas en Costa Rica. Éstas y otras recomendaciones relacionadas con las entrevistas serán encontradas en la Sección 5.1.

4.2 Clasificación de Operadores

Cuando un sistema de niveles fue definido para los operadores del Servicio de Información 113, y 121 de los 150 operadores fueron clasificados en los niveles (ver Sección 3.23), el grupo estaba apto para analizar la distribución en los niveles. La lista completa con los nombres de los operadores y sus respectivas notas puede ser encontrada en el Apéndice F.

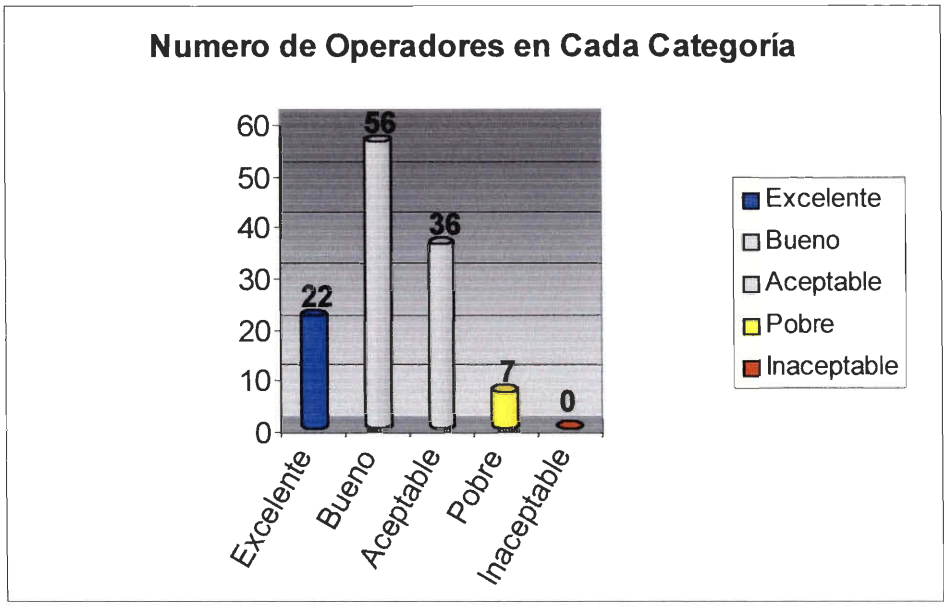


Figura 4.8 Número de Operadores en Cada Clasificación

Como puede concluirse de Figura 4.8, la distribución de los operadores en los niveles forma una curva similar a una distribución de "Bell-Curve." La mayoría de los operadores 46%, está en la categoría de desempeño "bueno." Además de esto, 22 operadores alcanzaron el nivel de desempeño "excelente," lo que significa que no cometerían ningún error en el mes. Este número fue sorprendentemente alto, y definitivamente muy alentador. De esta distribución, el nivel de excelencia puede ser estipulado como un objetivo para los operadores del Servicio de Información 113. Ningún de los operadores fue clasificado en el último nivel considerado "inaceptable," pero siete de ellos fueron clasificados en el nivel de desempeño "pobre." Las recomendaciones sobre este asunto serán encontradas en la Sección 5.2.

Desempeño del Operador Más Alto, Más Bajo, y Promedio		
	Nota de Desempeño	**Clasificación**
Más alto	100 %	A
Más bajo	95.7 %	D
Promedio	99.37 %	C

Tabla 4.1 Desempeño del Operador Más Alto, Más Bajo, y Promedio

El porcentaje promedio de desempeño del operador fue 99,37%; está clasificado en la categoría del desempeño "aceptable," sólo un poco abajo de la categoría de desempeño "bueno." Por este sistema de clasificación, los operadores del Sistema de Información 113 no parecen estarse desempeñando pobremente pero con una expectativa creciente para el mejoramiento. Es una creencia del grupo del proyecto que esta clasificación muestra a los operadores que el mejoramiento en su desempeño puede ser alcanzado, y que su trabajo no pasará inadvertido para el Servicio.

4.3 CLASIFICACIÓN DEL SERVICIO

La siguiente información que el grupo analizó fue la información con respecto a la vista general del Servicio de Información 113. La clasificación es basada en el número de llamadas atendidas correctamente cada mes como se definió en Sección 3.3. La información fue separada en secciones diferentes. La lista completa con el Programa de Vista General del Servicio será encontrada en el Apéndice G. Pero, la primera sección de información en este Capítulo es de los informes con las clasificaciones anuales y mensuales de 1999, que están localizados en Tabla 4.2, en la página proxima.

Datos Anuales y Mensuales del Servicio en 1999				
	Llamadas Recibidas	**Llamadas Atendidas Correctamente**	**Porcentaje de Llamadas Atendidas Correctamente**	**Nota del Servicio**
ene - 99	1,856,695	1,660,186	89.42 %	**3**
feb - 99	1,771,338	1,605,565	90.64 %	**2**
mar - 99	1,981,052	1,784,266	90.07 %	**2**
abr - 99	1,887,723	1,698,814	89.89 %	**3**
may - 99	1,943,941	1,721,710	88.57 %	**3**
jun - 99	2,376,791	1,792,832	75.43 %	**4**
jul - 99	2,377,677	1,992,890	83.82 %	**4**
ago - 99	2,389,243	2,199,563	92.06 %	**2**
sep - 99	1,021,140	923,314	90.42 %	**2**
oct - 99	2,516,921	2,259,902	89.79 %	**3**
nov - 99	2,602,579	2,382,086	91.53 %	**2**
dic - 99	2,777,194	2,531,575	91.16 %	**2**
TOTAL	25,502,294	22,550,703	88.43 %	**3**

Tabla 4.2 Datos Anuales y Mensuales del Servicio en 1999

La nota anual del Servicio para 1999 fue 3, lo que significa que el Servicio de Información 113 tuvo un desempeño "aceptable." Como está representado en Tabla 4.2 y en Figura 4.9, la nota del Servicio fue 4, o desempeño "pobre," en los meses de junio y julio. A pesar de que el Servicio no está siendo desempeñado de manera "pobre" definitivamente se puede mejorar al desempeño. Operar en el nivel 2, o desempeño "bueno" debe ser el objetivo mínimo para el Servicio. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.2.

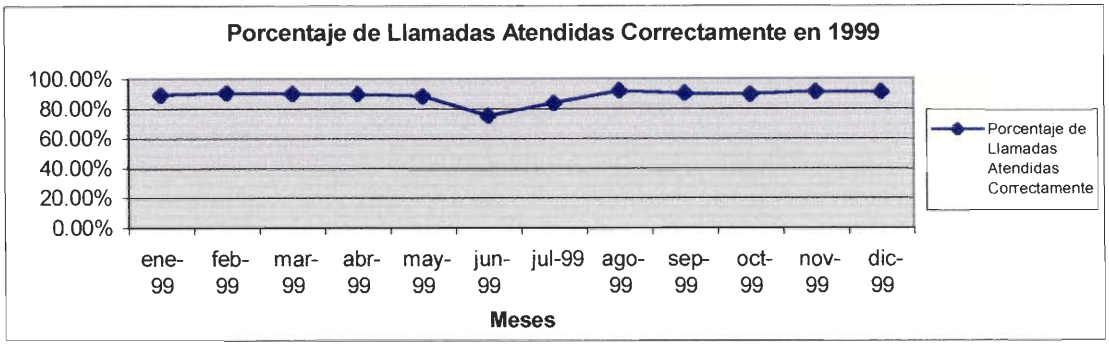


Figura 4.9 Porcentaje de Llamadas Atendidas Correctamente en 1999

La segunda sección de información es de los informes mensuales y anuales de la clasificación del 2000 de enero hasta mayo; está demostrado en Tabla 4.3, abajo.

Datos Mensuales y Anuales del Servicio en 2000				
	Llamadas Atendidas	**Llamadas Atendidas Correctamente**	**Porcentaje de Llamadas Atendidas Correctamente**	**Nota del Servicio**
ene - 00	2,851,967	2,547,842	89.34 %	**3**
feb - 00	2,648,937	2,367,976	89.39 %	**3**
mar - 00	2,891,590	2,590,676	89.59 %	**3**
abr - 00	2,611,382	2,134,789	81.75 %	**4**
may - 00	2,905,331	2,568,003	88.39 %	**3**
TOTAL	13,909,207	12,209,206	87.78 %	**3**

Tabla 4.3 Datos Mensuales y Anuales del Servicio en 2000

La nota actual del Servicio para el 2000 es 3, lo que significa que el Servicio de Información 113 tuvo un desempeño "aceptable." Como está demostrado en Tabla 4.3 y Figura 4.10, la nota del servicio fue 4, o desempeño "pobre," en el mes de abril. A pesar del Servicio no está siendo desempeño de manera "pobre" definitivamente se puede para mejorar al desempeño. Operar en el nivel 2 (desempeño "bueno") o mejor debe ser el objetivo mínimo para el Servicio en 2000. Las recomendaciones sobre este asunto serán encontradas en la Sección 5.2.

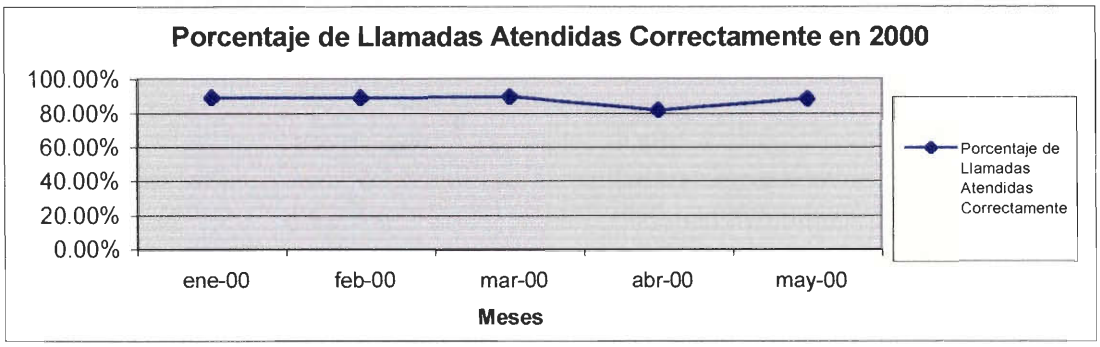


Figura 4.10 Porcentaje de Llamadas Atendidas Correctamente en 2000

Además de la información de los informes anuales, es importante para el Servicio que exista una comparación año por año y mes por mes. Comparando los totales de Tablas 4.2 y 4.3, como en Figura 4.11, la tendencia de desempeño del Servicio puede ser visualizada entre 1999 y 2000.

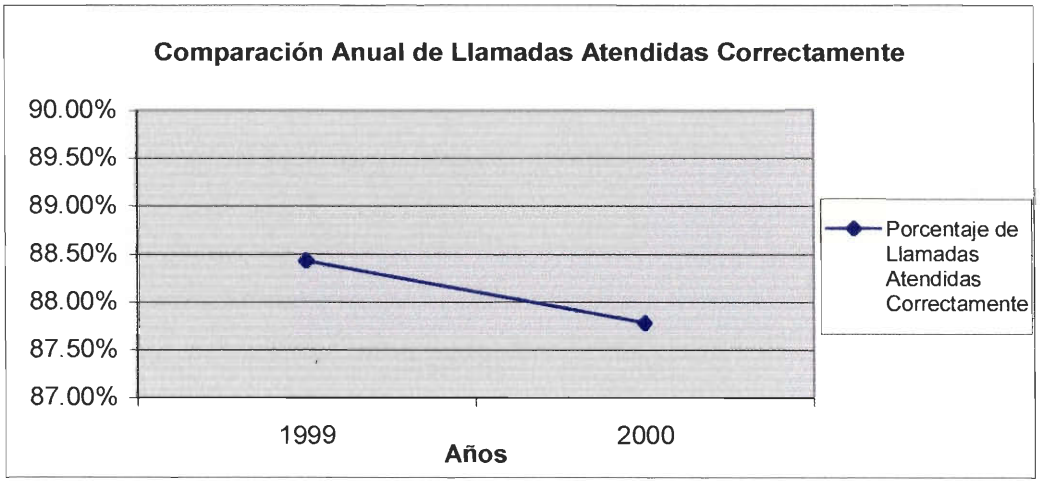


Figura 4.11 Comparación Anual de Llamadas Atendidas Correctamente

Aunque el porcentaje de llamadas atendidas correctamente en 1999 y 2000 están solo a 1% de distancia, la recta descendente está claramente visible. Mientras que no haya una gran debacle entre los años, todavía sigue siendo importante decir que el Servicio no está mejorando con el tiempo. Debiese también tenerse en consideración que Figura 4.11 representa el año de 1999 por entero, y solamente los meses de enero hasta mayo de 2000. Como el año de 2000 no está representado por entero no se puede comparar los años por entero. Figura 4.12 muestra una comparación solamente entre los meses de enero a mayo de ambos años.

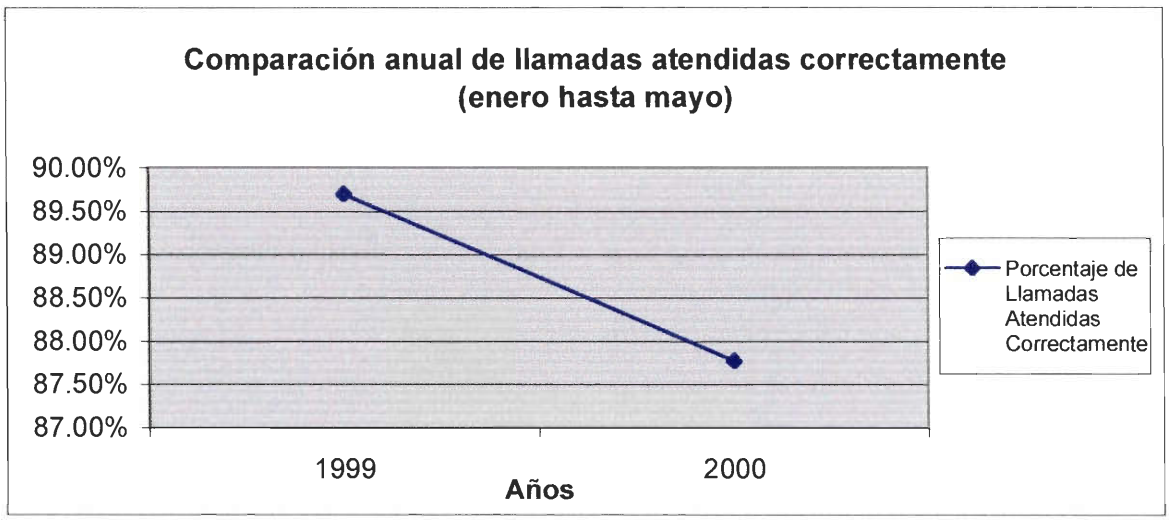


Figura 4.12 Comparación de Llamadas Atendidas Correctamente (enero a mayo)

Cuando comparamos solamente estos meses, la descendencia de la recta se ve más severa de la mostrada en Figura 4.11. La diferencia entre el desempeño de los años se ve en 2%. Es importante que el Servicio tenga conocimiento del decrecimiento e intente hacer todos los cambios necesarios para mejorar al desempeño. Las recomendaciones relacionadas con este asunto están en la Sección 5.2.

Igualmente importante para ver la tendencia de la recta es analizar la comparación de resultados mes a mes que está localizada en el Apéndice G. De estos resultados se puede ver en cada uno de los meses el desempeño del Servicio declinó un poco. El decrecimiento más notable ocurrió en la comparación entre los meses de abril, cuando el Servicio fue calificado como "bueno" en abril del 1999, y "pobre" en abril del 2000.

Del análisis de información presentado en este Capítulo, el gruip fue capaz de hacer conclusiones sobre los resultados y hacer recomendaciones. Estas conclusiones y recomendaciones creadas, con las recomendaciones y conclusiones generales del proyecto, están en su parte integral en el siguiente Capítulo.

APPENDIX N CONCLUSIONES Y RECOMENDACIONES

Aunque es importante y relevante la presentación de los datos y su análisis no es el único paso para un proyecto de suceso. La creación de recomendaciones desde los datos reunidos y para el futuro son partes importantes de esto proyecto, especialmente considerando que los resultados del proyecto pueden continuar a ser usados después de la partida de los estudiantes de Costa Rica. Por consiguiente, en este capítulo están incluidas las recomendaciones y conclusiones creadas por el equipo del IQP.

5.1 Entrevista del Operador

Es una impresión de los estudiantes que los operadores que trabajan en el Servicio de Información 113 tienen pocas oportunidades para expresar sus quejas y sugerencias. Los resultados de la entrevista de los operadores (ver sección 3.11) muestran esta opinión. Un cierto numero de operadores escribió paginas completas de sugerencias y comentarios. De los resultados de la entrevista (ver sección 4.1), el grupo de trabajo concluyó que los operadores del Servicio de Información 113 no están satisfechos con varios aspectos de su trabajo. Como mencionada en la sección 4.1, una gran cantidad de los problemas son significativamente importantes para los operadores. Por la tentativa de mejorar las condiciones generales de trabajo de los operadores y resolver algunos de sus problemas, el equipo de IQP cree que el desempeño de los operadores también será mejorado. Por esa razón el grupo desenvolvió algunas recomendaciones.

El primero conjunto de recomendaciones es sobre la capacitación que los operadores reciben del Servicio de Información 113 en el momento de su contratación. La actual capacitación fue desenvolvía en 1996 y nunca fue actualizada, por eso, el grupo de trabajo cree que modificaciones necesitan ser hechas para tornarla más efectiva. A través de la entrevista, los operadores propusieran una serie de sugerencias sobre posibles mejoramientos en la capacitación, indicando los problemas existentes en la capacitación. Desde esas sugerencias, el grupo recomienda que el Servicio de Información 113 aumente la duración del programa de capacitación.

El actual programa de capacitación tiene la duración de quince días, durando tres horas por día. Solamente cinco días son dedicados para platicar en el programa Orchestra. La capacitación debe todavía permanecer con la duración de quince días, y el número de horas dedicados a la capacitación debe ser aumentada de tres para cuatro horas. Dentro de este periodo más largo de capacitación, el Servicio debe incluir también más practica con la base de datos, proporcionando a los operadores ejemplos reales de los posibles errores que pueden ocurrir y como corregirlos.

Los tópicos para los días del programa de capacitación deben seguir el siguiente formato descrito abajo:

Día Uno: Los tópicos explicados deben incluir introducción al Servicio, facilidades y empleados del Servicio de Información 113. Los capítulos uno, dos y tres del manual de capacitación descritos más adelante en esta sección deben ser estudiados.

Día Dos: Los tópicos explicados deben incluir como comportarse, como mantener la calidad del servicio, porque y como los operadores son

evaluados, introducción al programa Orchestra, como utilizar las teclas en el teclado de los operadores y como buscar la información en la base de datos. Los capítulos cuatro, cinco, seis y siete del manual del operador deben ser estudiados. A partir de este momento, los operadores deben tener acceso al programa Orchestra en la sala de capacitación.

Día Tres: Los tópicos explicados deben incluir practica con el teclado y como buscar la información en la base de datos. Capítulos ocho y nueve en el manual de capacitación deben ser estudiados.

Día Cuatro: Los operadores deben tener un examen para determinar su conocimiento en el teclado, y el esclarecimiento de cualquier tópico que todavía no fue muy bien comprendido por los operadores. El contenido y uso de la tecla de emergencia en el teclado del operador debe ser explicada en este momento.

Día Cinco: Los tópicos explicados deben incluir como buscar números de teléfono públicos y frecuentemente solicitados. El capítulo doce sobre la geografía de Costa Rica debe tener sido estudiado antes de este punto en el programa de capacitación.

Día Seis: Los tópicos explicados deben incluir como poner los clientes en espera, como solicitar ayuda de los supervisores, como transferir las llamadas y tratar los clientes que no hablan español. Un segundo examen debe ser administrado para evaluar el conocimiento de los operadores hacia este momento.

Día Siete: Los operadores deben ser acomodados en la sala de los operadores para observar como el Servicio funciona. Capítulos diez y once deben tener sido estudiados en este momento.

Día Ocho: Los operadores deben practicar el recibimiento de llamadas con la asistencia de un operador más experimentado. En el final del día se debe hacer una sección de esclarecimiento de dudas.

Día Nueve: Un examen final debe ser administrado a los operadores y en este momento todas las dudas de los operadores deben tener sido esclarecidas.

Los días restantes de la capacitación deben ser dedicados a práctica. Durante estos días, los operadores en capacitación deben siempre estar asistidos de un operador más experto. Durante todo el período de capacitación, una computadora debe estar instalada en la sala de capacitación para permitir que el operador practique con el sistema mientras aprende.

El nuevo manual de capacitación debe consistir en doce capítulos:

1. Reseña histórica del ICE
2. El Sistema Nacional de Telecomunicaciones
3. Implantación de Sistemas de Información
4. Cómo Comportarse
5. El Sistema de Evaluación (La lista de posibles errores debe ser incluida en este capítulo)
6. Definición de la Configuración del Sistema
7. Clases de búsqueda en los diferentes archivos de la Base de Datos

8. Definición de las teclas (El contenido de la tecla de emergencia debe ser incluido en este capítulo)
9. Procedimientos de búsqueda
10. Ficha guía de capacitación
11. Material Didáctico (En este capítulo las secciones: Números Nacionales, Localidades que se usan con abreviaturas, lista actualizada de Sinónimos, Utilidad de la palabra clave, lista actualizada de Razones de difícil escritura, Información adicional de departamentos del ICE más solicitados por el cliente, Práctica de razones sociales, Siglas, Hospitales de la Caja Costarricense del Seguro Social, Clínicas de la Caja Costarricense del Seguro Social, lista actualizada de Entidades del Gobierno, Programa de Telefonía Rural para búsqueda de públicos administrados, lista actualizada del Desglose en el archivo FCNL, y lista actualizada de Razones Sociales más solicitadas y donde se localizan; deben ser incluidas.)
12. La Geografía de Costa Rica

Al mismo tiempo que el Servicio deberá dedicar más tiempo y recursos para implementar un más largo y detallado programa de capacitación, es una creencia del grupo que los beneficios de este cambio irán sobrepujar el coste. Con una mejor capacitación, el desempeño de los operadores irá mejorar, diminuyendo la posibilidad de una necesidad de una futura re-capacitación. Mejorando el programa de capacitación el desempeño global del Servicio irá mejorar a medida que el desempeño individual del operador también mejore.

La siguiente serie de recomendaciones es sobre las condiciones físicas de trabajo de los operadores. Un gran número de operadores tienen problemas con sus condiciones de trabajo, como fue indicado en la entrevista. Dos recomendaciones son muy fáciles de serien implementadas y fueran mencionadas como sugerencias por más de 20% de los operadores entrevistados. Los operadores mencionaron que están descontentos con las sillas en la sala de los operadores. Aunque el grupo de trabajo testó las sillas y noto que son cómodas, los operadores que se quedan sentados en ellas por horas no tiene la misma opinión. El grupo de trabajo recomienda que el Servicio de Información 113 investigue la posibilidad de comprar nuevas sillas.

Sillas ajustables ayudarían a aliviar la incomodidad de estar sentado en el mismo sitio por un turno entero y mejoraría el dolor causado por un empleo sedentario. Por la manera que la entrevista fue estructurada es imposible determinar cual tipo de sillas serian mas cómodas.

En adición a las sillas en la sala de los operadores, un gran número de operadores se quejaron de la iluminación, indicando que se torna difícil ver durante la noche. Como el Servicio funciona 24 horas por día, es muy importante que el operador que trabaja en la noche no tenga la visión perjudicada. El grupo de trabajo recomienda que el Servicio de Información 113 busque cómo mejorar la iluminación de la sala de los operadores. Lámparas más fuertes en el techo ayudarían a solucionar el problema. Como el desempeño del operador puede ser afectado por ese problema, el Servicio debería contratar una compañía especializada en iluminación para arreglar el problema. El Servicio también puede instalar lámparas individuales en cada uno de los puestos de operador. Además también debería ser considerada la compra de protecciones para las

pantallas de las computadoras, ayudando así el operador a no forzar la vista trabajando en la computadora por varias horas.

Además de las condiciones físicas de trabajo, mucho operadores también mencionaron tener problemas con la duración y frecuencia de sus descansos como está escrito en la sección 4.11. Aumentando la duración de los descansos, el Servicio estaría diminuyendo el tiempo trabajado por operador y el salario. Hacer una recomendación general para aumentar la duración de los descansos seria inapropiado, desde que muchos operadores piensan que la duración de los descansos es apropiada. Una vez más debido a la estructura de la entrevista no fue posible identificar la mejor solución para el problema.

Como recomendación general, el Servicio no debe cambiar la duración o la frecuencia de los descansos hasta que el tópico sea investigado más profundamente. Algunos pasos necesitan ser tomados antes que el Servicio pueda cambiar los descansos. Primero, los operadores necesitan estar a parte de la situación. Éste puede ser alcanzado con un memorando explicando las preocupaciones relacionadas con el cambio, descritas anteriormente. El memorando debe tener una explicación detallada de las posibilidades incluyendo, combinar dos descansos de 15 minutos en uno de 30 minutos, o simplemente creando descansos adicionales. Una caja de sugerencias debe ser colocada en la sala de los operadores para que ellos expresen sus opiniones. Si la mayoría de los operadores mencionar en una necesidad en particular de modificación esta debe ser implementada. Pero si la mayoría de los operadores esta de acuerdo que no se debe cambiar la duración o la frecuencia de los descansos, estos no deben ser cambiados.

El próximo conjunto de recomendaciones es sobre la interacción entre los operadores, el departamento de controle de calidad y departamento administrativo del

Servicio de Información 113. Muchos operadores mencionaron una falta de comunicación entre ellos y el departamento de controle de calidad. De acuerdo con la investigación de este proyecto, la falta de comunicación realmente existe entre las dos áreas. Por esa razón el grupo creó dos recomendaciones para el Departamento de Control de Calidad.

La primera recomendación es que el Departamento de Control de Calidad dé más reacciones informativas a los operadores sobre su desempeño. Los operadores actualmente reciben reportes semanales sobre los errores que cometieron y pueden revisarlos antes que el reporte final con la cantidad de errores hechos en el mes sea creado. Pero la comunicación personal con los operadores es necesaria en adición a los reportes escritos. En lugar de solo listar los errores cometidos por el operador en cada semana, su desempeño debe ser comentado. Si un operador tiene un desempeño excelente en una semana este debe ser apuntado por el supervisor (de manera escrita o verbal). Si un operador cometió un gran numero de errores durante una semana en particular, el debe ser motivado a mejorar. Las reacciones informativas deben ser mejoradas en calidad no en cuantidad. Discutiendo con el operador su desempeño, el Departamento de Control de Calidad será capaz de entender mejor las razones por detrás de éste y los operadores tendrán una mejor percepción de las opiniones de los supervisores sobre su trabajo.

El segundo conjunto de recomendaciones es sobre la percepción del operador sobre su importancia a la compañía y al Servicio. Varios de los operadores expresaron la idea que ellos son vistos como herramientas del Servicio y no como personas. Este sentimiento, basado en hecho o en percepciones, ciertamente puede afectar el desempeño

de los operadores. Los operadores necesitan tener la seguridad que los otros empleados del Servicio de Información 113 los ven como sendo personas fundamentales al Servicio y que sus preocupaciones no están siendo ignoradas. El grupo recomienda que el Servicio críe un periódico mensual que será distribuido para todas las personas que trabajan en Servicio de Información 113. El periódico debe describir cualquier noticia sobre ICE y sobre el Servicio, describiendo todos los cambios y la razón de estos cambios. En este periódico también deben estar escritos los nombres de los operadores que desempeñaron bien y excelente en el mes.

5.2 Sistemas de Clasificación

Para interpretar el significado de cada uno de los niveles de clasificación de operador y del Servicio, el grupo creó recomendaciones sobre los niveles. La primera serie de recomendaciones es sobre el sistema de clasificación del operador. Sigue abajo las recomendaciones para los cinco niveles de operador:

A Operadores que fueran clasificados en el nivel excelente deben ser recompensados financieramente por su desempeño y dedicación. Los operadores que se encuentran en este nivel por la primera vez deben tener sus nombres escritos en la pantalla en la sala de los operadores y en el periódico descrito anteriormente. Los operadores que estuvieron clasificados en este nivel por la segunda vez consecutiva o más deben recibir una recompensa monetaria además de tener su nombre exhibido en

las formas descritas anteriormente, el valor de la recompensa debe ser decidido por la administración.

B Cuando un operador fue clasificado en el nivel bueno de desempeño, debe tener su nombre en la lista publicada en el periódico. Los supervisores deben motivar los operadores a alcanzar el nivel de excelencia.

C El desempeño en este nivel es considerado aceptable pero no deseable, el operador clasificado en este nivel debe recibir de forma escrita y verbal motivación del Departamento de Control de Calidad para mejorar su desempeño.

D Los operadores que fueron clasificados en este nivel deben ser advertidos sobre su desempeño. Esta advertencia no debe ser una amenaza, y sí una nota importante para motivar el operador a mejorar su desempeño. Si un operador esta clasificado en este nivel por más de un mes consecutivo una reunión debe ser fijada con el Departamento de Control de Calidad para intentar descubrir o porque de este desempeño. Dependiendo de la razón que esta causando este desempeño, las necesarias acciones deben ser tomadas.

E Operadores nunca deben estar clasificados en este nivel. Si este nivel fue alcanzado se debe apuntar una reunión urgente con el operador y el Departamento de Control de Calidad para discutir las razones. De esta reunión acciones inmediatas deben ser tomadas. Si el operador permanece en este nivel por mas de un mes él debe ser dispensado.

Todos los meses, la lista de clasificación de los operadores debe ser puesta en el cuadro de avisos, para los operadores acompañaren como estuvo su desempeño. Los nombres de los operadores que fueron clasificados en el nivel excelente y bueno deben tener su nombre en posición de destaque en la lista.

El siguiente conjunto de recomendaciones es sobre cada uno de los niveles del sistema de clasificación del Servicio

1 El desempeño del servicio debería estar clasificado en este nivel en todos los momentos. En este nivel ningún cambio necesita ser efectuado.

2 Aunque este nivel indica un desempeño bueno por parte del Servicio, el Servicio debe intentar determinar porque no esta desempeñando en el nivel de excelencia. Después del problema ser identificado acciones deben ser tomadas para resolver el problema.

3 El Servicio deberá descubrir la razón de este desempeño, y hacer los cambios necesarios para atingir el nivel de excelencia.

4 En este nivel de desempeño, el Servicio definitivamente debe estar enfrentando un problema, sea con los operadores o algún problema técnico. Independientes del problema acciones inmediatas deben ser tomadas para cambiar esta situación.

5 Si el Servicio está clasificado en este nivel hay algún problema muy serio ocurriendo y acciones drásticas y urgentes deben ser tomadas inmediatamente. El servicio nunca debe estar clasificado en este nivel.

Actualmente el Servicio está clasificado en el nivel aceptable (ver figura 4.12). El grupo recomienda que el Servicio busque mejorar su desempeño siguiendo las recomendaciones mencionadas en este Capítulo.

5.3 Recomendaciones para los Supervisores

Conversando con los supervisores en el Departamento de Controle de Calidad, el grupo identificó una serie de problemas con sus condiciones de trabajo de ellos. A causa de esto, el grupo desarrolló un conjunto de recomendaciones. Primero la oficina del Departamento de Control de Calidad es muy pequeña y con un gran número de supervisores trabajando allí. El exceso de población hace difícil y inconfortable la labor. Un nivel creciente de conforto puede ser directamente conectado a una mejoría en el desempeño. Por esa razón, se recomienda la construcción de cubículos individuales para cada uno de los supervisores, para permitir una mayor privacidad y conforto. Siguiendo esta misma línea de pensamiento se debe reservar uno de los cubículos para hacer la revisión de las grabaciones con los operadores. Ese cubículo reservado para revisión acabará con la necesidad de buscar una maquina que no esta siendo usada, para atender el operador.

El actual procedimiento de evaluación requiere que el supervisor creó todos los informes y evaluaciones manualmente. Eso toma mucho del tiempo de los supervisores sendo una tarea muy tediosa de desempeñar. Para remediar la situación, el grupo recomienda que los supervisores utilicen el programa de evaluación creado en el proyecto (ver Capítulo 3.4). El programa irá eliminar la necesidad de escribir a mano los informes y evaluaciones, y mejorará la velocidad y eficiencia de los supervisores.

5.4 Recomendaciones Generales

Además de las recomendaciones descritas previamente, el grupo también desarrolló varias recomendaciones que no pueden ser clasificadas en ninguna categoría en especial. El primero conjunto de estas recomendaciones es sobre los programas que son usados en el Servicio. La recomendación más importante es sobre el contestador, Unidad Automática de Respuesta (ARU), una parte del programa Orchestra que transfiere el número de teléfono seleccionado al cliente (ver capítulo 2.3132). El grupo recomienda que el Servicio busque inmediatamente en la resolución de este problema. A pesar del Servicio estar intentando resolver el problema, este todavía existe y necesita ser arreglado inmediatamente. El problema está afectando el desempeño de los operadores y del Servicio y necesita ser corregido hasta Enero de 2001. Este es período más que suficiente para buscar ayuda externa si necesario, y si el problema no puede ser arreglado se debe buscar por otros programas.

En adición al problema con el ARU, el Servicio también enfrenta problemas con los programas que utiliza por estos estar en inglés. El grupo del IQP tentó contactar la corporación E-Talk, la compañía que provee el programa, para recoger informaciones sobre este problema, pero no recibió respuesta. El grupo recomienda que el Servicio contacte E-Talk y averigüe la posibilidad de hacer la localización de los programas. Aunque es posible que esta solución no exista, el Servicio puede por lo menos sugerir la creación de esta posibilidad a la corporación E-Talk.

El programa de evaluación del operador está completo, pero el grupo del proyecto no fue incapaz de instalarlo en la Intranet del Servicio de Información 113. La

configuración de la red es diferente de lo que fue previamente descrito a nosotros, y por ese motivo el grupo fue incapaz de configurar las Paginas Activas de Servidor propiamente (ver sección 2.3142). La actual configuración consiste en múltiplas computadoras conectadas en una única red. No hay un servidor en especial que estas paginas tengan que ser instaladas. El Servicio necesita encontrar alguien con conocimiento de configuración de Intranet y Paginas Activas de Servidor para instalar las pagina en la red. Si posible el Servicio puede requerir este conocimiento especial de un estudiante de WPI en uno de los grupos de IQP, en uno de los proyectos recomendados más adelante.

Las recomendaciones finales del grupo de proyecto son sobre los posibles futuros Interactive Qualifying Projects con el Servicio de Información 113. El primero proyecto es sobre la capacitación. Aunque algunas recomendaciones fueran desarrolladas a partir de la entrevista con los operadores (ver sección 5.1), el grupo fue incapaz de estudiar la capacitación a fondo debido al poco tiempo. De cualquier forma, modificaciones y mejoramientos son necesarios en la capacitación. Por eso, el grupo recomienda que las necesarias modificaciones sean desarrolladas por un futuro Interactive Qualifying Project con el Worcester Polytechnic Institute.

El segundo posible futuro Interactive Qualifying Project es crear un plan de bonificación para los operadores. Este plan debe ser basado en la productividad del operador. La recompensa monetaria que el operador recibirá será basada en el desempeño antiguo y actual del propio operador con relación a la producción del Servicio.

5.5 Conclusiones Finales

El Servicio de Información 113 actualmente enfrenta varios problemas, muchos de estos fueron englobados en este estudio. El grupo de IQP sugirió algunas recomendaciones para el Servicio de Información 113 sobre las condiciones de trabajo de los operadores y supervisores, el sistema de clasificación para los operadores y el Servicio, el programa de capacitación para los operadores, y posibles futuros Interactive Qualifying Projects con el Servicio. Aunque estas recomendaciones mejorarán el desempeño y satisfacción de ambos operadores y Servicio, estos mejoramientos solamente pueden ser alcanzados con el arduo trabajo de los operadores, supervisores y las personas en los Departamentos administrativo y de Control de Calidad del Servicio. El desempeño actual del Servicio y de los operadores, descritos en este reporte, muestra una definitiva necesidad de mejoramiento y los estudiantes esperan que las soluciones desarrolladas en este proyecto empiecen el proceso.

La implementación de las recomendaciones proveídas por el grupo debe mejorar las condiciones de trabajo y el desempeño de ambos supervisores y operadores del Servicio de Información 113. A través estos mejoramientos, el desempeño del Servicio también será engrandecido. Aunque estos mejoramientos irán completar los objetivos de este proyecto, anteriormente definidos en este reporte, es el aspecto adicional del proyecto, descritos en la próxima pagina que lo califica como un Interactive Qualifying Project.

Un Interactive Qualifying Project mezcla las dos áreas de tecnología y sociedad para permite que los estudiantes entiendan como sus futuras carreras irán afectar la sociedad que serán parte. A través de los mejoramientos desarrollados para el Servicio de Información 113 en este proyecto, la población de Costa Rica, clientes del Servicio, será beneficiada.

Porque es el cliente que es lo más afectado por los mejoramientos de la calidad del servicio proveído por el Servicio de Información 113, es el público de Costa Rica que será beneficiado por los resultados de este proyecto. Es este aspecto del proyecto, mejor dicho, que las simples soluciones desarrolladas para los problemas que demuestra a este grupo de IQP como sus futuras carreras serán capaces de afectar positivamente la sociedad.

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