

UNIVERSITY OF KWAZULU-NATAL

**CUSTOMERS EXPECTATION AND PERCEPTION OF THE LEVEL OF
SERVICE PROVIDED BY AUTOLAB**

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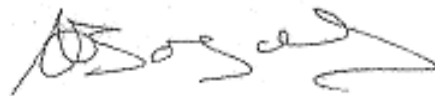
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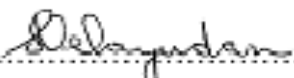
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Abstract

Autolab is a department of the South African Sugar Association, which develops and provides support services for computerised systems installed in the local sugar industry as well as one sugar mill in Zimbabwe.

Autolab's customers in South Africa were surveyed to measure their present levels of satisfaction towards the service provided by Autolab and to identify areas of strengths and weaknesses.

The data collected for this formal study was through a quantitative survey research instrument called SERVQUAL. The survey was limited to Autolab's Laboratory Information Management Systems (LIMS) users who are in contact with the Autolab staff and who will be able to rate their quality of service. These users are mainly the senior employees of the departments that are using the Autolab's LIMS systems. They represent the population of this study, which are 79 users. A very good response rate of 91 % percent was achieved with 72 questionnaires being completed and returned by the respondents.

The results of the survey show that the respondents' expectations exceeded their perceptions for all the service quality dimensions. However, the difference between expectations and perceptions was significant for all the service quality dimensions except the empathy dimension. This implies that Autolabs' customers have some level of dissatisfaction with the quality of service they provide. It is hoped that the shortcomings identified in this study will help Autolab to improve the quality of service they provide.

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CHAPTER ONE – Introduction to the Problem and Overview

1.1 Introduction

The South African Sugar Industry is an important contributor to the national economy. It generates an estimated annual direct average income of six billion rand and provides direct and indirect employment for 427,000 people (Internet 1, 2008).

The industry consists of approximately 45,300 registered growers and six millers. The millers are Illovo Sugar Ltd, Tongaat-Hulett Sugar Ltd, TSB Sugar RSA Ltd, UCL Company Ltd, Umfolozi Sugar Mill (Pty) Ltd and Ushukela Milling (Pty) Ltd (Internet 6, 2009).

The growers and millers have their own associations, which are the SA Cane Growers' Association and the SA Sugar Millers' Association Limited. They have a proceeds sharing partnership, which was established in 1935 and is administered by the South African Sugar Association (Internet 1, 2008).

The South African Sugar Association is a non-governmental organization that has both internal supporting and industry supporting divisions, which provide a range of specialist services that enhance the profitability, global competitiveness and sustainability of the industry (Internet 1, 2008).

Autolab is a department of the Information Systems and Facilities Management Division of the South African Sugar Association, which develops and provides support services for computerised systems installed at 14 mills in South Africa and 1 mill outside the country (Internet 1, 2008).

This study surveys Autolab's customers in South Africa, in order to measure their present levels of satisfaction towards the service provided by Autolab and to identify areas of strengths and weaknesses. The results of the survey will be used to recommend strategies to the management of Autolab, which will be used to improve any areas of weaknesses that may be identified.

1.2 Background and Context

1.2.1 The Sugar Industry

The South African sugar industry is regarded as one of the lowest cost competitive producers of high quality sugar. This industry makes an important contribution to the national economy through its “agricultural and industrial investments, foreign exchange earnings, its high employment, and its linkages with major suppliers, support industries and customers” (Internet 5, 2008). It generates an estimated annual direct average income of six billion rand and provides direct and indirect employment for 427,000 people (Internet 1, 2008). Direct employment is provided in cane production and processing while indirect employment is provided in the numerous support industries in sectors such as fertiliser, fuel, chemical, transport, food and services (Internet 5, 2008).

There are fourteen sugar mills, which are owned by six different milling companies that produce sugar in South Africa. Twelve of the fourteen sugar mills are located in KwaZulu-Natal and the remaining two are located in Mpumalanga (Internet 5, 2008).

The six sugar millers are members of an association called the South African Sugar Millers’ Association, whose objectives are to cover legislative measures affecting the industry, training, scientific and technological research, and compilation of statistics (Internet 5, 2008).

Figure 1.1 below is map of the fourteen South African Sugar Mills and where they are situated.



Figure 1.1: Map of Operation Areas

Source: <http://www.sugar.org.za/Uploads/ade9ede8-f3e6-4b74-a90b-8fe986199e9f/Operations%20map.pdf>

1.2.2 The South African Sugar Association

The South African Cane Growers' Association (CANEGROWERS) is a section 21 Company established to administer the interests of independent sugarcane growers. Individual cane growers are members of this association through the 38 grower groups, which make up the member organizations (Internet 5, 2008).

The South African Sugar Millers' Association and the South African Cane Growers' Association have a proceeds sharing partnership, which is administered by the South African Sugar Association (SASA) (Internet 5, 2008).

SASA is a non-governmental organization, which administers the partnership between the South African Cane Growers' Association and the South African Sugar Millers' Association Limited. It has a council, which is made of equal amount of members from the growers and millers associations with the chairman and vice-chairman usually alternating every two years between a miller and grower. The purpose of the council is to administer the affairs of SASA. SASA is financed from the proceeds of the sale of sugar (Internet 5, 2008).

It has divisions that support core industry activities, support the industry partnership and support the internal divisions of SASA. These divisions provide a range of specialist services that enhance the profitability, global competitiveness and sustainability of the industry. Two of the divisions that support core industry activities are Cane Testing Services (CTS) and Information Systems – Autolab (Internet 5, 2008).

“The Cane Testing Service provides a specialist service under contract to individual Mill Group Boards to determine the quality of individual grower cane deliveries to the mill for cane payment purposes. This analytical chemistry service assesses the recoverable value content in cane delivered to the mill by growers, providing a neutral and objective basis on which to calculate recoverable value payment by miller to grower. The CTS also provides a technical audit of the distribution between millers and growers ensuring fair and equitable division of proceeds” (Internet 5, 2008).

“Autolab develops and provides support services for computerised systems installed at 14 mills in South Africa and 1 mill outside of the country” (Internet 5, 2008). One of Autolab's customers is the Cane Testing service. Autolab is the focus of this research and will be covered a bit more below.

1.2.3 Autolab

Coreejes (2007) says that the Autolab's “LIMS system has now been running successfully at fifteen sugar mills for several years. The system allows for the

management of all major functions at a sugar mill, from the submission of estimates through despatching of sugar and related products.” He further states that “for ease of understanding, the functionality of the system can be segregated and described in various modules”, which are the Mill Group Board Module, Cane Supply Module, Cane Testing Module and Factory Module. The functionality of the modules can be described as follows:

- Mill Group Module

The Mill Group Board Module “allows for the management of growers, their farms and fields” Coreejes (2007).

- Cane Supply Module

The Cane Supply Module allows for the management of cane deliveries, comparisons between deliveries and delivery allocations and the management of weighbridge operations. In addition to this, a second variant of this module allows for the setup and management of a vehicle control system (Coreejes, 2007).

- Cane Testing Module

“The Cane Testing Module was originally designed for the South African method of cane sampling and analysis but now can easily accommodate most cane testing systems, including grab and core sampling, first expressed juice testing and press analysis. The system comprises a weighbridge program and a laboratory program for capturing instrument readings and calculating results. Depending on the method of cane testing, a choice of mill yard programs and additional laboratory programs are available” (Coreejes, 2007)

- Factory Module

The factory laboratory system allows for the analysis of factory samples, recording of mill downtime, calculating of factory stock, factory meter system and reporting of laboratory information (Coreejes, 2007).

1.3 Motivation for the Study

The researcher is an employee in the Autolab department of the South African Sugar Association and he has realized that Autolab has not conducted a customer satisfaction survey since the LIMS system was implemented seven years ago. Autolab

is a monopolist in the South African sugar industry and it has no idea of what its customers think of the quality of service it delivers to them. This study will benefit Autolab and its customers because the study will identify areas of possible strengths and weaknesses. This will assist Autolab in developing strategies to enable them maintain customer satisfaction in areas of strength and improve upon customer satisfaction in areas of weaknesses in terms of quality of service.

1.4 Focus of the Study

The main focus of this study is to measure the satisfaction levels of Autolab's customers with the quality service they provide. The study results will enable the researcher to make recommendations that will enable Autolab to attend to any weak areas in terms of its service.

1.5 Problem Statement

The perceived problem is that Autolab has no idea of how well or badly their respective industry clients rate their service and as a result of this, they may be unaware of the deficiencies or customer dissatisfaction levels in the service they provide.

1.6 Research Objectives

The objectives of the study are to:

- Determine the levels of satisfaction Autolab's clients have with Autolab.
- Determine whether there is any difference in satisfaction levels between users of the different laboratory information management systems modules.
- Assess gaps between Autolab's clients' perceptions and their expectations of the quality of service provided.
- Ascertain what suggestions Autolab's clients have for service improvement.

1.6.1 Research Questions

This study seeks to answer the following questions:

- Are Autolab's customers satisfied with the service they provide?
- Are the satisfaction levels of the different laboratory information management systems modules users the same?

- If the customers are dissatisfied, what are the reasons for the customers' expectations not being met?
- What suggestions do the customers have for improving Autolab's service to them?

1.7 Limitations of the Study

The study will only survey senior employees that use the different modules of LIMS at the sugar mills. Given the current economic crisis in Zimbabwe, Autolab's Zimbabwean customer will be excluded from the customer survey.

1.8 Structure of the Study

The remainder of the study is presented in four key chapters, which are as follows:

- **Chapter Two – Literature Survey**

This chapter focuses on defining services, customer perceptions, service quality, customer satisfaction and finally a model to measure service quality.

- **Chapter Three – Research Methodology**

The research methodology that was used to research the problem statement and the objectives of this research are discussed in this chapter.

- **Chapter Four – Data Analysis**

The results of the survey of Autolab's customers located at the fourteen sugar mills in South Africa are presented in this chapter. The results are presented using descriptive and inferential statistics.

- **Chapter Five – Conclusions and Recommendations**

This chapter highlights the results of the survey, draws conclusions and provides recommendations to address identified shortcomings in terms of Autolab's service levels. In addition suggestions for further research are made.

1.9 Summary

This chapter has discussed the perceived problem and has set out research objectives to be researched, concerning Autolab's service levels to the industry. In the following

chapter, as highlighted in the structure of the study, literature appropriate to this research will be discussed.

CHAPTER TWO - Literature Survey

2.1 Introduction

The authors Philip and Hazlet (1997) say that “to talk about better quality and improving service quality without first defining what it is, how it is perceived by the customer, and how it can be improved and enhanced, will be of little or no value in the service quality arena.” This chapter focuses on defining services, customer perceptions, service quality, customer satisfaction and finally a model to measure service quality.

2.2 Services

Service is defined as an act that one party performs for another, which may be part of a product or the product itself (Kotler, 2003; Perreault and McCarthy, 2005).

Services “include all economic activities whose output is not a physical product or construction, is generally consumed at the time it is produced, and provides added value in forms (such as convenience, amusement, timeliness, comfort, or health) that are essentially intangible concerns of its first purchaser” (Zeithaml and Bitner, 2000).

It is “essentially intangible and does not result in ownership of anything” (Kotler, 2005. “When you provide a customer with a service, the customer can’t keep it. Rather, a service is experienced, used, or consumed. You go see a Dream Works Pictures movie, but afterward all you have is a memory. You ride on a ski lift in the Alps, but you don’t own the equipment” (Perreault and McCarthy, 2005).

Services are also produced by goods manufacturers. Warranties offered by car manufacturers is an example of a service provided by goods manufacturers (Zeithaml and Bitner, 2000).

The authors Philip and Hazlet (1997) say that “service organizations generally lag behind their manufacturing counterparts when it comes to embracing total quality management and continuous improvement strategies” largely due to the characteristics of services.

2.2.1 Characteristics of Services

The characteristics of services are intangibility, inseparability and perishability (Kotler, 2003; Perreault and McCarthy, 2005). According to Kotler (2003), variability is also a characteristic of services.

Figure 2.1 below is a graphical representation of the characteristics of services.

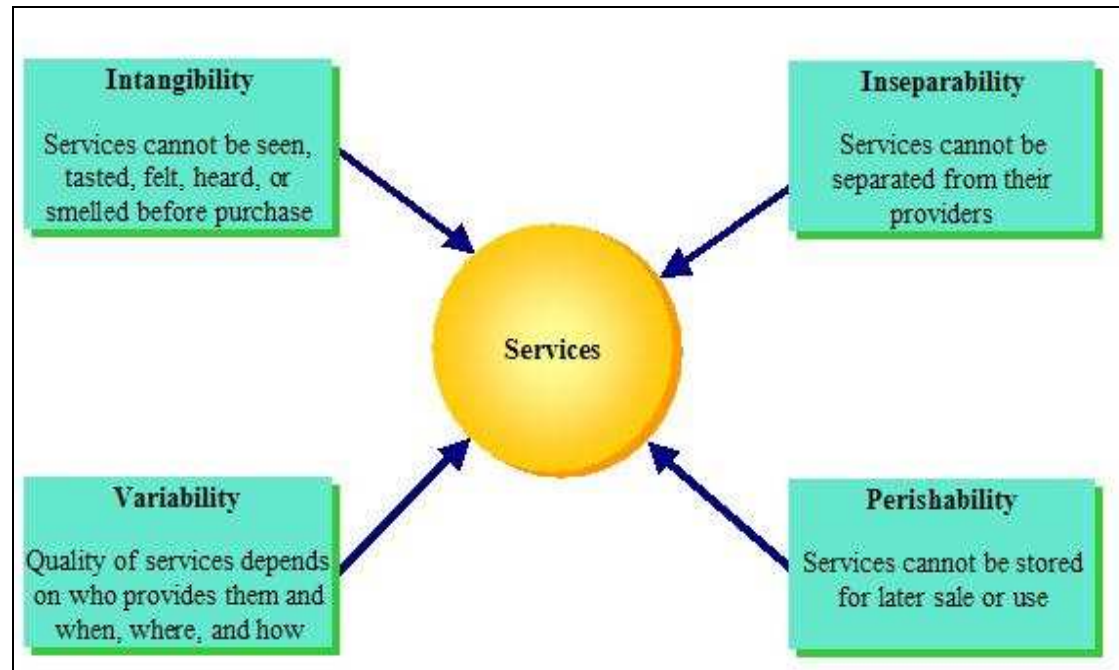


Figure 2.1: Four Service Characteristics

Source: Kotler, P. and Armstrong, G. (2001) Principles of Marketing, 9th edition. New Jersey, Pearson Prentice Hall.

The definition of the characteristics of services is as follows:

- Intangibility

“Intangibility is a key determinant of whether an offering is a service or not” (Zeithaml and Bitner, 2000). “Unlike physical products, services cannot be seen, tasted, felt, heard or smelled before they are bought” (Kotler, 2003). Services also cannot be held (Perreault and McCarthy, 2005).

Most products are a combination of tangible and intangible elements. A Domino’s pizza is tangible, but the fast home delivery is not” (Perreault and McCarthy, 2005).

Due to the intangibility of services potential customers “will look for evidence of service quality from the place, people, equipment, communication material, symbols, and price that they see” (Perreault and McCarthy, 2005).

- Inseparability

Services are usually produced and consumed simultaneously while physical goods go through the process of being manufactured, stored, distributed to resellers before it is finally consumed later on (Kotler, 2003; Zeithaml and Bitner, 2000). Services are also usually produced in the presence of customers while the production of goods are not (Perreault and McCarthy, 2005).

”The customer’s involvement in service delivery increases the difficulty of standardizing services. The service quality is determined by this interaction, not simply by the quality of the service provider’s efforts. For example, the excitement of a classroom discussion varies with the preparation by both the instructor and the students. If the students or the instructor are unprepared, the quality of the service is diminished” (Winer, 2004).

- Variability

Services are highly variable because they depend on the provider, location and the time the service is provided. Due to the variability, service buyers will seek advice from other people before they select a service provider (Kotler, 2003).

The variability is due to services mostly being performed by humans. There are no two services that are exactly the same (Zeithaml and Bitner, 2000; Winer, 2004).

Service performance can differ between purchase occasions even if the same person performs it. Therefore, it is “more difficult to control quality for services than for manufactured products” (Winer, 2004).

- Perishability

Perishability refers to the fact that services cannot be stored (Zeithaml and Bitner, 2000; Kotler, 2003; Perreault and McCarthy, 2005). An example of service perishability is when a patient misses a doctor’s appointment, which may result in the doctor charging the patient because the service value existed only at that time (Kotler, 2003). The perishability of services makes it hard to balance supply and demand for services especially if the demand for services fluctuates (Perreault and McCarthy, 2005; Kotler, 2003).

Zeithaml and Bitner (2000) say that due to perishability companies need to have strong recovery strategies when things go wrong. He gives an example if a customer does not like his hair cut; the hairdresser will not be able to restore his hair to what it was before the hair cut. Therefore, he says the hairdresser should have recovery strategies to regain the customer's goodwill when he encounters such a problem.

2.2.2 Categories of Service Mix

Kotler (2003) says "a company's offering to the marketplace often includes some services. The service component can be a minor or a major part of the total offering."

He says that the five offerings of categories are the following:

- Pure tangible good
These are products with no accompanying services e.g. washing powder, toothbrush or rice.
- Tangible good with accompanying services
These are products with one or more services e.g. cars and computers.
- Hybrid
These consist of equal parts of products and services e.g. people go to restaurants for both service and food.
- Major service with accompanying minor goods and services
An example is airline companies, which offer mainly transport service to their clients and also some minor products and services like food and drinks.
- Pure Service
An example is babysitting, which consists primarily of service.

2.3 Customer Service

Zeithaml and Bitner (2000) define customer service as "the service provided in support of a company's core product". While Wagenheim and Reurink (1991), define customer service as a "management strategy that focuses on meeting customer expectations".

Zeithaml and Bitner say that all types of companies, which include informational technology companies, goods manufacturers and service businesses, provide customer service. They further state, “Customer service most often includes answering questions, taking orders, dealing with billing issues, handling complaints, and perhaps scheduling maintenance or repairs. Customer service can occur on site (as when a retail employee helps a customer find a desired item, or answers the question), or it can occur over the phone or via the internet. Many companies operate customer service call centers, often staffed around the clock. Typically, there is no charge for customer service. Quality customer service is essential to building customer relationships. It should not, however, be confused by the services provided for sale by a company.”

Customer service is “based on the concept that an organization will reach its goal effectively and efficiently through the satisfaction of the customer. Organizations that have successfully implemented a customer service program believe it has been instrumental in meeting their goals and contributing to the success of their firms” (Wagenheim and Reurink, 1991).

2.4 Delivering High Customer Value

Customer value is “the difference between the benefits a customer sees from a market offering and the cost of obtaining those benefits” (Perreault and McCarthy, 2005). It is “an integration of perceptions of product and service quality, transaction price, life cycle costs and risk” (Naumann and Jackson, 1999). Customer value is high if the expected benefits by the customer are greater than what he outlaid (Naumann and Jackson, 1999). A customer is more likely to be satisfied if he perceives a company’s offering to be of high customer value, while a consumer is unlikely to become a customer if he perceives a company’s offering to be of low customer value (Perreault and McCarthy, 2005). This is shown in Figure 2.2, which is a graphical representation of customer value and competition.

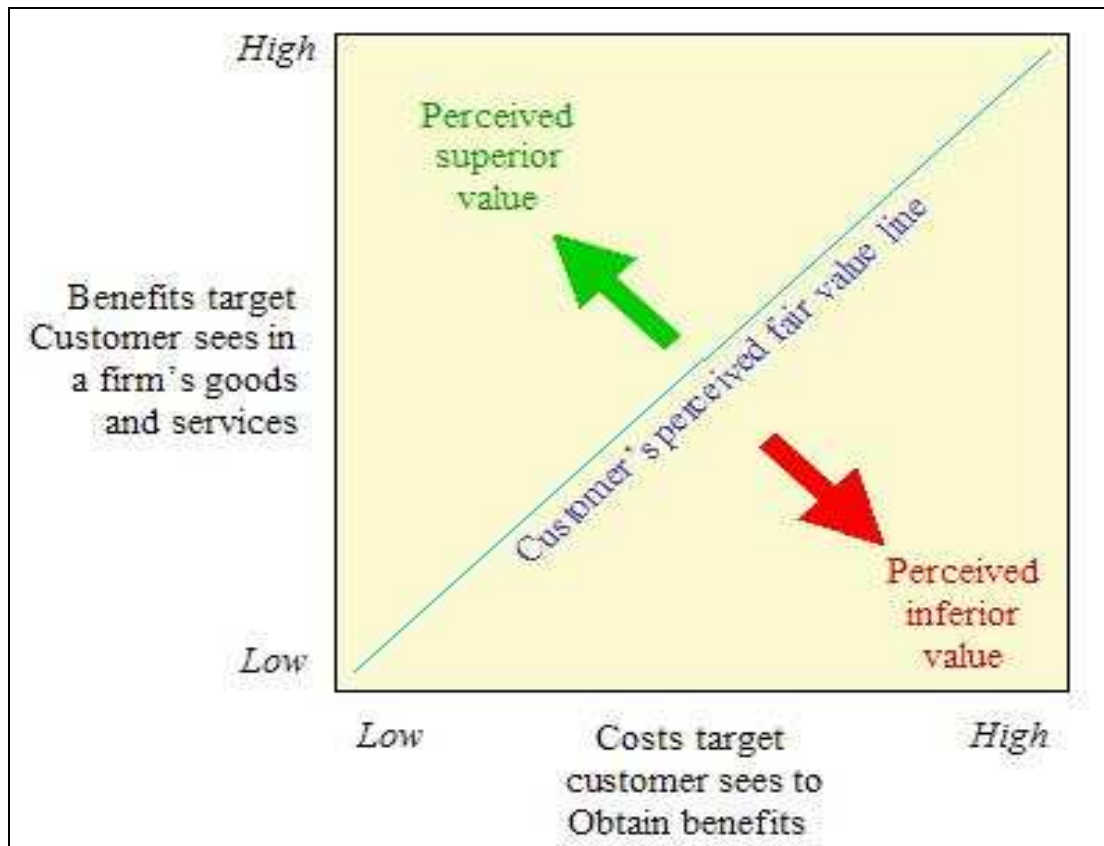


Figure 2.2: Customer Value and Competition

Source: Perreault D.W. and McCarthy E.J. (2005) Basic Marketing: A Global Managerial Approach. 15th edition. New York, McGraw-Hill/Irwin.

A company that offers superior customer value is likely to attract new customers and retain current customers from their competitors (Perreault and McCarthy, 2005). This will increase long-term growth and profitability (Stahl *et al.*, 1999).

2.5 Customer Loyalty

“Customer loyalty refers to the customer’s willingness to continue buying from the company” (Whitwell, Lukas and Doyle, 2003). Highly satisfied customers are more likely to become loyal customers of a company (Lovelock and Wirtz, 2004). Ryals (2005) say that the important issue is not customer loyalty or retention but profitable customer retention. He says companies should acquire and retain large customers or customers who have the greatest potential.

2.6 Customer Perceived Value

Customers perceive services in terms of quality and how satisfied they are overall with their experiences (Zeithaml and Bitner, 2000). While customer satisfaction and

service quality “have certain things in common, satisfaction is generally viewed as a broader concept while service quality assessment focuses specifically on dimensions of service. Based on this view, perceived service quality is a component of customer satisfaction” (Zeithaml and Bitner, 2000). Figure 2.3 below illustrates the distinction between customer satisfaction and service quality.

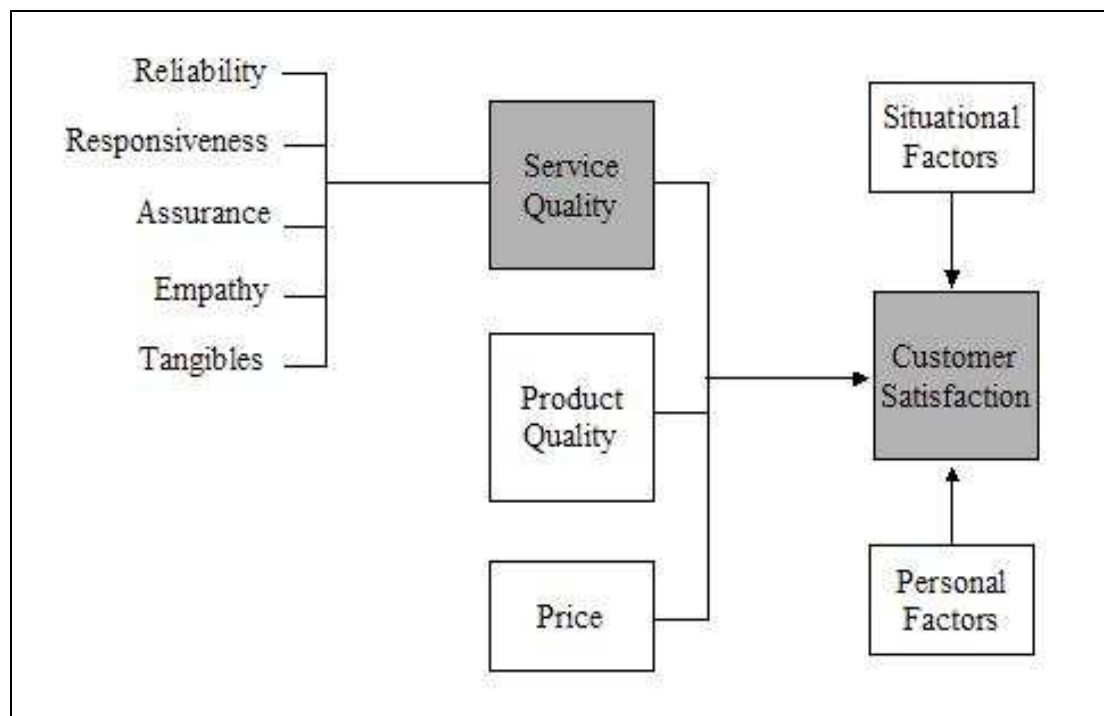


Figure 2.3: Customer Perceptions of Quality and Customer Satisfaction

Source: Zeithaml, A.V. and Bitner, J.B. (2000) *Services Marketing: Integrating Customer Focus Across the Firm*. 2nd edition. McGraw-Hill/Irwin.

“Service quality is a focused evaluation that reflects the customer’s perception of specific dimensions of service: reliability, responsiveness, assurance, empathy, tangibles. Satisfaction, on the other hand, is more inclusive: it is influenced by perceptions of service quality, product quality, and price as well as situational factors and personal factors” (Zeithaml and Bitner, 2000).

According to Kotler (2003), “Customer perceived value is the difference between the prospective customer’s evaluation of all the benefits and all the costs of an offering and the perceived alternatives. Total customer value is the perceived monetary value of the bundle of economic, functional, and psychological benefits customers expect from a given market offering. Total customer cost is the bundle of costs customers

expect to incur in evaluating, obtaining, using and disposing of the given market offering”. Figure 2.4 shows the determinants of customer delivered value.

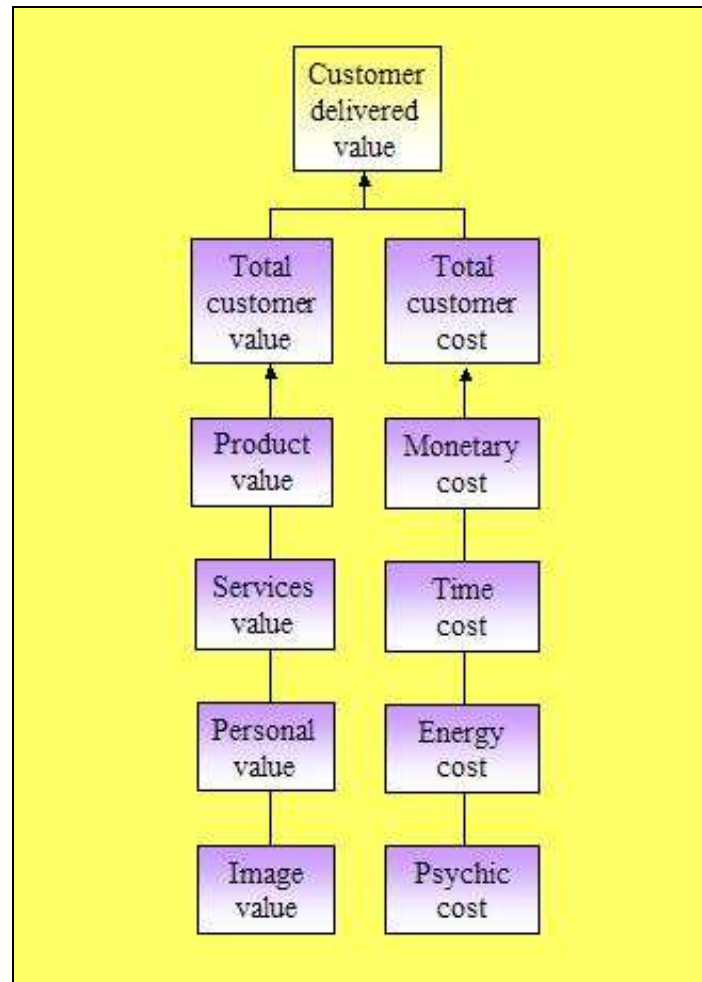


Figure 2.4: Determinants of Customer-Delivered Value

Source: Kotler, P. (2003) Marketing Management. 11th edition. New York, Pearson Prentice Hall.

2.7 Service Quality

The authors Pitt, Watson and Kavan (1995), report that “service quality is the most researched area of services marketing (Fisk, et al., 1993). They say, “The concept was investigated in an extensive series of focus group interview conducted by Parasuraman, et al. (1985). They conclude that service quality is founded on a comparison between what the customer feels should be offered and what is provided. Other marketing researchers (Gronroos, 1982; Sasser, et al., 1978) also support the notion that service quality is the discrepancy between customers’ perceptions and expectations”. Winer (2004) says that due to the intangibility of services, customer’s

perception plays a bigger role in determining the quality of service than it does in determining the quality of manufactured products. Therefore, he says it would not be an exaggeration to say that quality of service is how customers perceived the service to be. “A customer’s perception of quality is based on a comparison of the quality actually experienced to what he or she expected to occur when the service was delivered“ (Winer, 2004). Figure 2.5 shows a model for service quality.

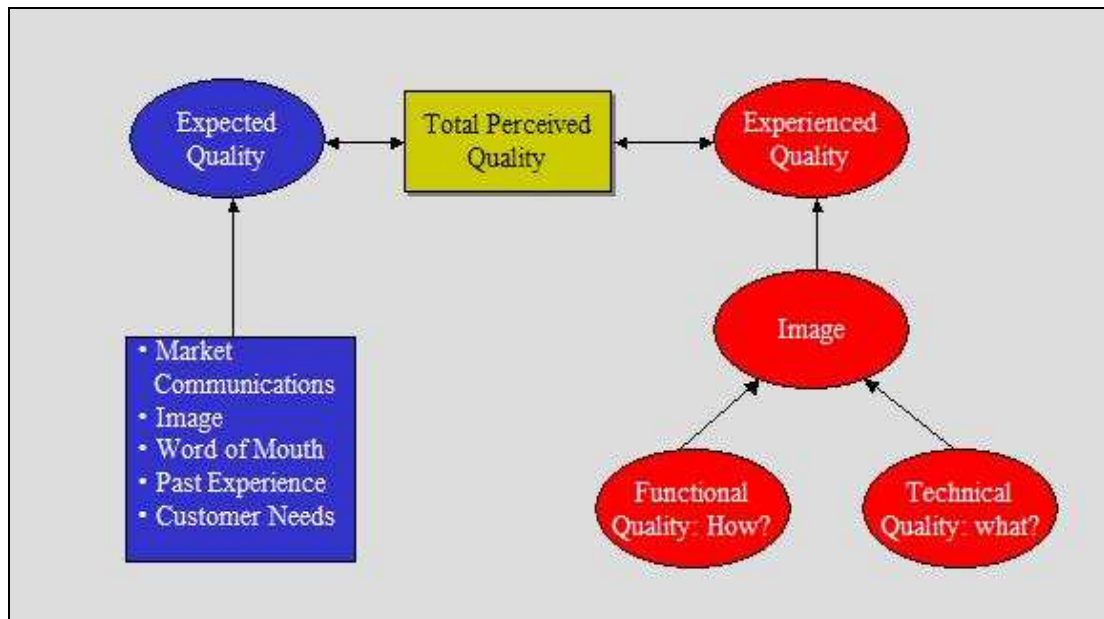


Figure 2.5: A Model of Perceived Quality

Source: Winer, RS. (2004) Marketing Management. 2nd edition. New Jersey, Pearson Prentice Hall.

Expected quality, which is on the left side of Figure 2.5, depicts what the customer expects the service to be like. Winer (2004) says that the customer’s expectation is based on information derived from the market, communications from the company, the image the company has developed from its communications, word of mouth communications from people, past experience with the service provider and the needs of the customer.

The experienced quality, which is on the right side of Figure 2.5, depicts the customer perception of the quality of service he has received from the service provider. Winer (2004) says that the customer’s perception of experienced quality is based on the two components, which are technical quality and functional quality. He says that technical quality in the computer software world would be the quality of advice given to the

customer. “Functional quality is how the service delivered, or the quality of the actual interaction with the company” (Winer, 2004). He gives an example of functional quality, which is the friendliness of the telephone receptionist or how long it takes before the telephone is answered.

2.8 Dimensions of Service Quality

Zeithaml and Bitner (2000) say, “Service quality assessment focuses specifically on dimensions of service such as reliability, responsiveness, assurance, empathy and tangibles. For example, service quality of a health club is judged on attributes such as whether equipment is available and in working order when needed, how responsive the staff are to customer needs, how skilled the trainers are, and whether the facility is well-maintained”. The service “dimensions represent how consumers organize information about service quality in their minds”. Winer (2004) says that Zeithaml *et al.*, (1996) model of service quality is called the RATER model, and the importance of this model is that a company can use the dimensions for differentiation and positioning. Figure 2.6 is a graphical representation of the dimension of service quality.

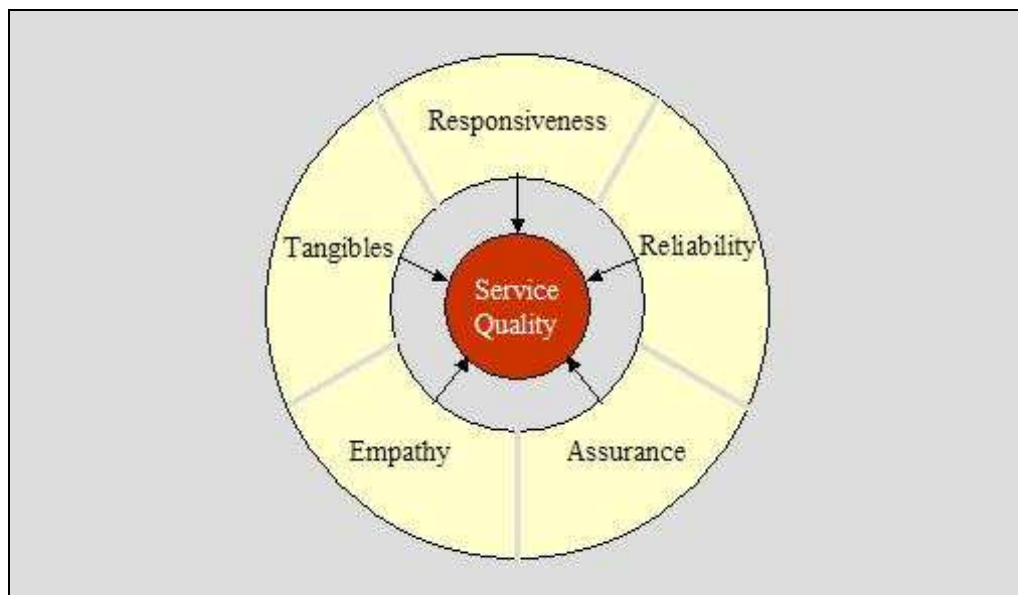


Figure 2.6: Dimensions of Service Quality

Source: Winer, RS. (2004) Marketing Management. 2nd edition. New Jersey, Pearson Prentice Hall

The definitions of the five dimensions of service quality are:

- Reliability

Reliability is the ability of the service provider to perform the required service accurately and dependably (Zeithaml and Bitner, 2000; Winer, 2004). It “has been consistently shown to be the most important determinant of perceptions of service quality among U.S customers. Customers want to do business with companies that keep their promises, particularly their promises about the core service attributes. Firms that do not provide the core service that customers think they are buying fail their customers in the most direct way” (Zeithaml and Bitner, 2000).

- Assurance

Assurance is the knowledge and courtesy of the service provider’s employees and their ability to gain the confidence of their customers (Zeithaml and Bitner, 2000; Winer, 2004). It is “likely to be important for services that the customer perceives as involving high risk and/or about which they feel uncertain about their ability to evaluate outcomes, for example banking, insurance, brokerage, medical and legal service” (Zeithaml and Bitner, 2000).

- Tangibles

“Tangibles are defined as the appearance of physical facilities, equipment, personal, and communication materials. All of these provide physical representations or images of the service that customers, particularly new customers, will use to evaluate quality” (Zeithaml and Bitner, 2000).

- Empathy

“Empathy is defined as the caring, individualized attention the firm provides the customer. The essence of empathy is conveying, to personalized or customized service, that customers are unique and special. Customers want to feel understood by and important to firms that provide service to them” (Zeithaml and Bitner, 2000). Winer (2004) says that empathy is “the high level of attention given to customers.”

- Responsiveness

Responsiveness “is the ability of the service provider to respond to the customer’s needs on a timely basis” (Winer, 2004). “This dimension emphasizes attentiveness and promptness in dealing with customer requests, questions, complaints, and problems. Responsiveness is communicated to customers by the length of time they have to wait for assistance, answers to questions, or attention to problems. Responsiveness also captures the notion of flexibility and ability to customize the service to customer needs” (Zeithaml and Bitner, 2000).

2.9 Gaps in Perception of Quality

It’s inevitable that there will be a discrepancy between the expectations of the service delivered and the quality of the experience (Winer, 2004). Customers tend to talk more about poor service than they would about good service. The “asymmetry of the effects of negative and positive discrepancies is theoretically justified by the well-known psychological phenomenon called loss aversion” (Winer, 2004). Figure 2.7 is a graphical representation of loss aversion.

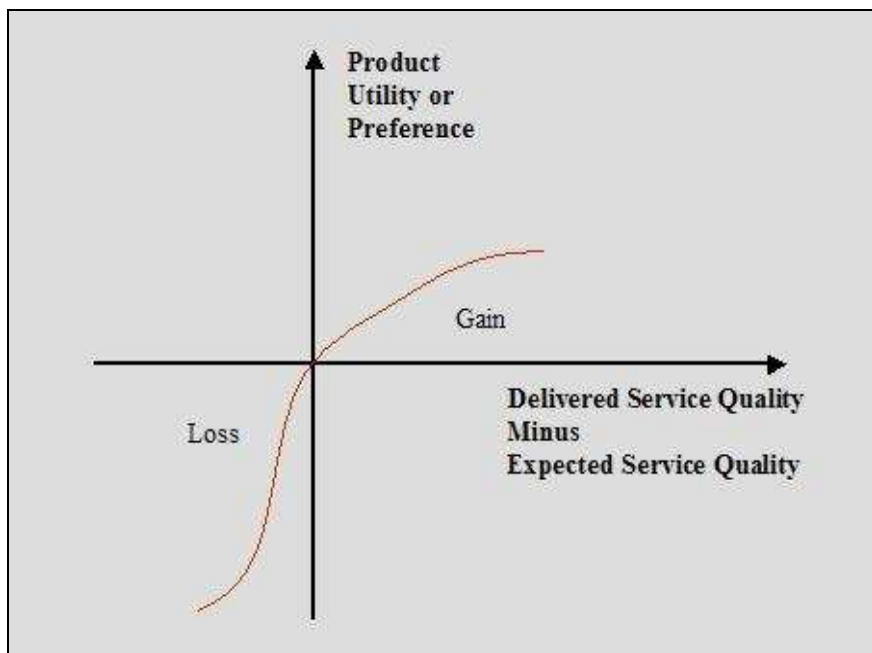


Figure 2.7: Loss Aversion Model of Service Quality

Source: Winer, R.S. (2004) Marketing Management. 2nd edition. New Jersey, Pearson Prentice Hall

Losses in Figure 2.7 are when the expected quality of the service is lower than the quality of service delivery. Gains in Figure 2.7, are obtained when the quality of

service delivered is greater the expected quality of service. Winer (2004) says, “The curve to the left of the vertical axis demonstrates that losses are more negatively valued than gains are positively valued”. The reason is customers react more strongly to poor service than they do to good service. Marketing managers can remedy the negative gaps between the expected service quality and the perceived service quality delivered by lowering service expectations or raising service quality. Raising service quality is the best option for the service provider in the long-term than lowering service expectations because it is difficult to manage customer expectations (Winer, 2004).

A service provider having a positive gap between perceived service quality and service expectation can also have a problem in the future if his customers increase their service expectations and he does not increase his already high service quality (Winer, 2004).

Zeithaml and Bitner (2000) say that companies need to close negative gaps between customer expectations and perceptions of service in order to satisfy and build long-term relationships with their customers.

Winer (2004) says that the major discrepancies between expectations and realizations can be categorized into the following four general types of gaps:

- The gap between customers’ expectations and management perceptions.
- The gap between management’s perception and service quality specifications.
- The gap between service quality specifications and service delivery.
- The gap between service delivery and external communications.

Zeithaml and Bitner (2000) give a similar definition of the four gap categories as Winer (2004). The authors say that the four categories are:

- Not knowing what customers expect.
- Not selecting the right service designs and standards.
- Not delivering to service standards.
- Not matching performance to promises.

Figure 2.8 below is a graphical representation of the four gap categories.

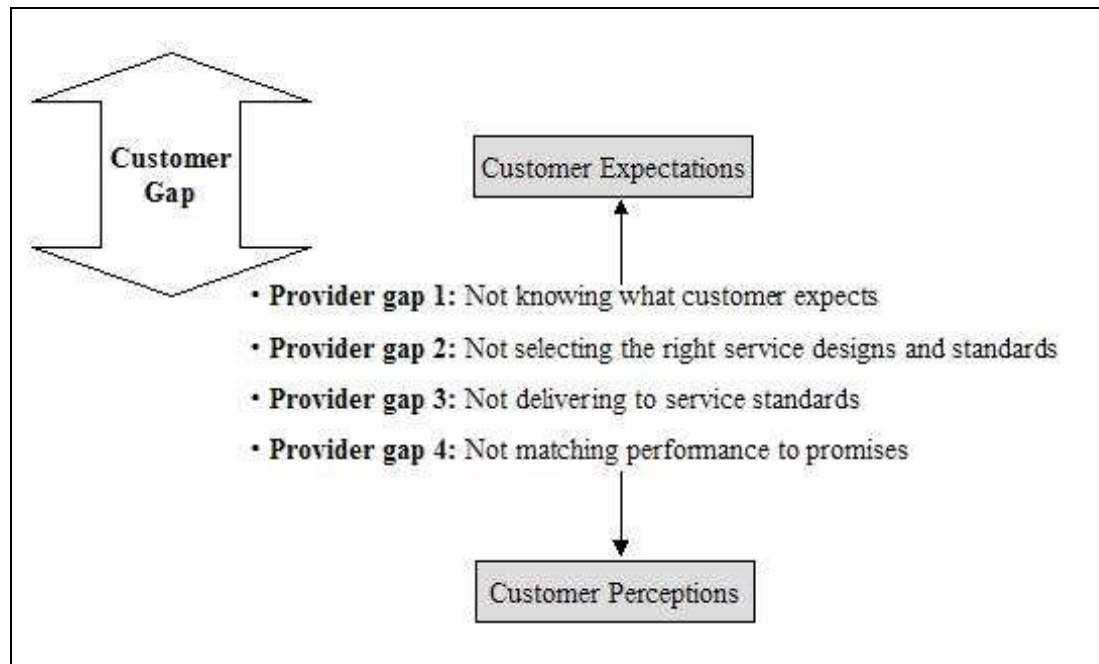


Figure 2.8: Key Factors Leading to the Customer Gap

Source: Zeithaml, A.V. and Bitner, J.B. (2000) *Services Marketing: Integrating Customer Focus Across the Firm*. 2nd edition. McGraw-Hill/Irwin.

The definitions of the four gap categories are as follows:

- Not knowing what customers expect.

There are many reasons for managers not being aware of customers' expectations. Some of the reasons are managers are not dealing directly with customers, are unwilling to ask customers what they expect from the service being provided or the managers are unprepared to address customers' expectations (Zeithaml and Bitner, 2000).

“When people with the authority and responsibility for setting priorities do not fully understand customer's service expectations, they may trigger a chain of bad decisions and sub optimal resources allocations that result in perceptions of poor service quality “ (Zeithaml and Bitner, 2000).

Winer (2004) says that companies can remedy the problem of managers not understanding customer expectations by getting managers to attend focus groups it conducts and by giving the managers access to more formal research results.

- Not selecting the right service and standards.

Managers in service companies have difficulty in applying their understanding of customers' expectations (Winer, 2000; Zeithaml and Bitner, 2000). An example of this difficulty is when managers know that computer software customers want quick response to telephone calls but they have not discussed with the customers as to what response time will be acceptable (Winer, 2000). Zeithaml and Bitner (2000) say, "Customer driven standards are different from the conventional performance standards that most service companies establish in that they are based on pivotal customer requirements that are visible to and measured by customers. They are operation standards set to correspond to customer expectations and priorities rather than to company concerns such as productivity or efficiency".

- Not delivering to service standards.

Winer (2004) says even if the gap between management's perception and service quality specifications has been closed, the marketing objectives of the company will not be met if the company does not deliver on the quality specifications to the customer. Zeithaml and Bitner (2000) say, "even when guidelines exist for performing services well and treating customers correctly, high-quality performance is not a certainty. Standards must be backed by appropriate resources (people, systems, and technology) and also must be enforced to be effective – that is, employees must be measured and compensated on the basis of performance along those standards. Thus, even when standards accurately reflect customers' expectations, if the company fails to provide support for them – if it does not facilitate, encourage, and require their achievement- standards do no good. When the level of service-delivery performance falls short of the standards, it falls short of what customers expect as well".

- Not matching performance to promises.

A company's communications with its customers can have a big effect on their customer's expectations (Winer, 2004). Companies make promises through its media advertising, sales people, and other communications to customers, which may potentially raise their expectations and serve as the standard against which

customers assess the quality of service delivered (Zeithaml and Bitner, 2000). Customers will be dissatisfied if there is a discrepancy between the actual and promised service. “Broken promises can occur for many reasons: overpromising in advertising or personal selling, inadequate coordination between operations and marketing, and differences in policies and procedures across service outlets” (Zeithaml and Bitner, 2000). An example of a broken promise is a customer service person promising that a plumber would be at a customer’s home at a certain time but the plumber turns up later. (Winer, 2004).

2.10 Customer Satisfaction

Customer satisfaction is the customer’s “evaluation of a product or service in terms of whether that product or service has met their needs and expectations” (Zeithaml and Bitner, 2000). He will feel dissatisfied if the perceived performance falls short of his expectations, satisfied if the performance matches his expectations and highly satisfied if the performance exceeds his expectations (Kotler, 2003).

The “link between customer satisfaction and customer loyalty is not proportional” (Kotler, 2003). Kotler (2003) uses a customer satisfaction scale from one to five to show that the link is not proportional. At level one, which is the lowest level of the scale, customers are likely to abandon the company and tell others of their dissatisfaction. Although customers will be fairly satisfied at level two to four, they will still find it easy to switch to another company if they find a better offer. At level five, which is the highest level of the scale, a customer is very likely to repurchase from the company and also tell others of his satisfaction with the company. He says a highly satisfied customer has an emotional bond with the company and not just a rational preference. Kotler (2003) says that Xerox’s senior management found out that its “completely satisfied” customers are six times more likely to repurchase in the next 18 months than its “very satisfied” customers.

2.11 Customer Expectation

Zeithaml and Bitner (2000) define customer expectation as the “beliefs about service delivery that function as standard or reference points against which performance is judged. Because customers compare their perceptions of performance with these reference points when evaluating service quality, thorough knowledge about customer

expectations is critical to service marketers. Knowing what the customer expects is the first and possibly most critical step in delivering quality service. Being wrong about what customers want can mean losing a customer's business when another company hits the target exactly." Lovelock and Wirtz (2004) say what customers expect as good service vary between businesses. Customers expectation may also vary between businesses positioned differently in the same industry. These authors give an example where "travellers might expect no-frills service for a short domestic flight on a discount carrier but would undoubtedly be very dissatisfied with the same level of service, even in economy class, on a full-service airline."

Customers hold two types of expectations about service, which are the desired level of service and the adequate level of service (Zeithaml and Bitner, 2000). The desired level of service is the service the customers hopes to receive, while adequate service is the level of service the customer will accept. These authors give an example of desired level of service is when a person joins a dating agency expecting to meet an attractive person or someone they can marry. An example of adequate level of service is when a university graduate trained for a highly skilled job settles for an entry-level job. Adequate level of service is the minimum level of performance the customer will accept for the service being delivered (Zeithaml and Bitner, 2000).

Buyers form their expectations from past buying experience, advice of friends and associates and from information and promises made by marketers and their competitors (Kotler, 2003). If marketers raise the expectations of their customers too high, the customers are likely to be disappointed when their perceived value of their purchase is lower than their expectation. However, if they set their customers' expectations too low, it is likely to discourage them from purchasing, although it will satisfy those who do buy it (Kotler, 2003).

2.12 Measuring Service Quality

There is a need for measuring service quality because of the common belief of what is not measured is not managed (Lovelock, 2004). If service quality is not measured managers will not be sure "whether service quality gap exists, let alone what types of gaps, where they exist, and what potential corrective actions should be taken".

Managers will also not be able to determine “whether goals for improvement are being met after changes have been implemented” (Lovelock, 2004).

The quality of service cannot be measured in the same way as the quality of physical products (Winer, 2004). This is due to services being intangible, heterogeneous and inseparable from production and consumption that the traditional measures of performance cannot be used (Kang and Bradley, 2002). It can only be determined by administering an instrument survey to customers unlike the quality of physical products, which can be determined by using engineering or other physical metrics as the products come off the manufacturing line (Winer, 2004). According to Jain and Gupta (2004), SERVQUAL is one of the widely used scales for measuring service quality.

2.13 SERVQUAL

The SERVQUAL instrument is one of the most popular approaches to measuring service quality (Jain and Gupta (2004); Winer (2004); Caruana, Ewing and Ramaseshan (2000)). It has been developed by Parasuraman, Zeithaml and Berry and it, “is one of the preeminent instruments for measuring the quality of services as perceived by the customer” (Van Dyke *et al.*, 1999).

SERVQUAL is “based on the premise that customers can evaluate a firm’s service quality by comparing their perceptions of its service with their own expectations” (Lovelock and Wirtz, 2004). It is seen by many authors as a generic measuring tool that can be used to measure service quality across a broad spectrum of service industries (Van Dyke *et al.* (1999); Caruana *et al.* (2000); Masood *et al.* (2005)).

It was “originally developed and tested in the consumer retail environment” and has since been used in other sectors (Caruana, et al. (2000). Some of the sectors, Mohamed, et al. (2005) say that the SERVQUAL instrument can be used to measure service quality are hospitality, education, banking, telecommunication, healthcare, public services, professional services, retailing, catering, auto repair, transportation and shipping.

It is a concise multiple item scale (Kang and Bradley, 2000). According to Jain and Gupta (2004), the foundation for the SERVQUAL scale is the gap model proposed by Parasuraman, Zeithaml and Berry.

The Gap model has five gaps, which are as follows (Parasuraman, Zeithaml and Berry, 1985):

- Gap 1: Consumer expectation-management perception gap, which is the gap between consumer expectations of service quality and management perceptions of those expectations.
- Gap 2: Management's perception-service quality specifications gap, which is the gap between management perceptions of consumer expectations and the firm's service quality expectations.
- Gap 3: Service quality specifications-delivery gap, which is the gap between service quality specifications and actual service delivery.
- Gap 4: Service delivery-external communications gap, which is the gap between actual service delivery and external communications to customers about service delivery.
- Gap 5: Expected service-perceived service gap, which is the gap between consumer expectations of service and perceived service.

Figure 2.9 below is a graphical representation of the service quality gap model.

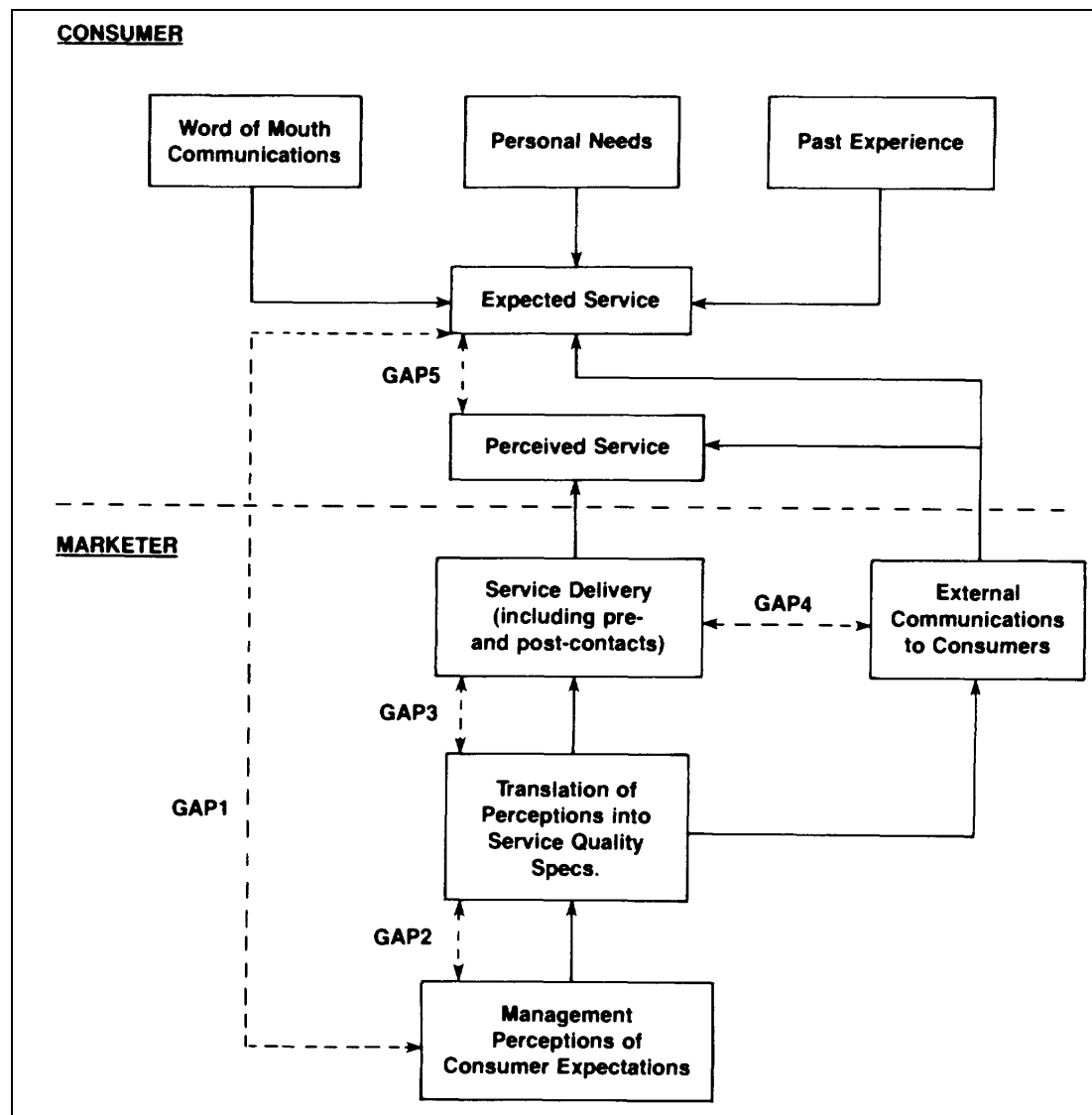


Figure 2.9: Service Quality Model

Source: Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1988) SERVQUAL: A Multiple-Item Scale For Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, 64, p.12-29.

According to Parasuraman *et al.* (1985), perceived service quality is, “posited to exist along a continuum ranging from ideal service quality to totally unacceptable quality, with some point along the continuum representing satisfactory quality”. The position of a consumer’s perception of service quality on the continuum depends on the nature of Gap 5, which is the discrepancy between expected service and perceived service. This implies if the expected service is less than perceived service, perceived service quality will range from less than satisfactory to totally unacceptable quality depending on the magnitude of the discrepancy. If the expected service is greater than perceived

service, perceived service quality will range from more than satisfactory to ideal quality depending on the magnitude of the discrepancy. Lastly, if expected service equals perceived service then service quality is perceived to be satisfactory (Parasuraman *et al.*, 1985). The magnitude and direction of Gap 5 is dependent on the magnitude and direction of Gap 1, Gap 2, Gap 3 and Gap 4 (Parasuraman *et al.*, 1985).

The SERVQUAL instrument is divided into two halves. One half of the instrument is intended to measure customers' expectations of service in organizations within the service categories being investigated and the other half is intended to measure their perceptions of service provided by the particular organization, whose service quality is being assessed (Kang and Bradley, 2000). This instrument measures service quality by using questions composed along the five dimensions of service quality, which are tangibles, reliability, responsiveness, assurance and empathy (Kang and Bradley (2000); Winer (2004)).

The definitions of the five dimensions of service quality are (Parasuraman *et al.*, 1985):

- Tangibles are the appearance of physical facilities, equipment and employees.
- Reliability is the ability of employees to perform the promised service dependably and accurately.
- Responsiveness is the willingness of employees to help customers and provide prompt service.
- Assurance is the knowledge and courtesy of employees and their ability to inspire trust and confidence.
- Empathy is the caring and individualized attention the firm provides its customers.

The SERVQUAL instrument allows for the measurement of service quality along each of the five dimensions of service quality and it also allows for the measurement of organizations overall service quality (Parasuraman *et al.*, 1988). Service quality is calculated for a dimension by averaging the difference scores on items making up that dimension. The difference score for an item, which represents perceived quality, is defined as the difference between the ratings on the corresponding perception and

expectation statements (Parasuraman *et al.*, 1988). Overall service quality is the average difference score across all five dimensions (Parasuraman *et al.*, 1988).

Although there have been extensive application of the SERVQUAL instrument, it has been criticized by many authors on various conceptual and operation grounds. Some of the major criticisms of the SERVQUAL instrument have been the use of (P-E) gap scores, length of the questionnaire, predictive power of the instrument, and the validity of the five-service dimension structure (Jain and Gupta, 2004).

The reasons for the criticisms are as follows:

- The use of the (P - E) gap scores
According to Jain and Gupta (2004), various authors have doubt in the ability of the gap scores (P-E) to provide additional information than what is already contained in the perception component of service quality. The authors, Cronin and Taylor (1992) are of view that there is little if any evidence to support the use of gap scores (P-E) as the basis for measuring service quality. Simple performance-based measures of service quality are considered to be superior by many authors of marketing literature (Cronin and Taylor, 1992).
- Validity of the (P-E) measurement framework
The “validity of the (P-E) measurement framework has also come under attack due to problems with the conceptualization and measurement of expectation component of SERVQUAL scale. While perception (P) is definable and measurable in a straightforward manner as the consumer’s belief about service is experience, expectation (E) is subject to multiple interpretations and as such has been operationalized differently by different authors/researchers (e.g. Babakus and Inhofe, 1991; Brown and Swartz, 1989; Dabholkar et al, 2000; Gronroos, 1990; Teas, 1993, 1994)” (Jain and Gupta, 2004). “It is because of the vagueness of the expectation concept that some researchers like Babakus and Boller (1992), Bolton and Drew (1991a), Brown, Churchill and Peter (1993), and Carman (1990) stressed the need for developing a methodologically more precise scale.” (Jain and Gupta, 2004)

- Length of the questionnaire

Jain and Gupta (2004) say that one of the serious problems with the SERVQUAL instrument is that it requires a large amount of data to be collected due to the instrument being long. It has a total of forty-four questions and data is collected about consumers' expectations and perceptions of a firm's performance on each of the 22 service quality scale attributes.

- Predictive power of SERVQUAL

One of the important variants of the SERVQUAL scale is the SERVPERF scale developed by Cronin and Taylor (1992). This scale discards the expectation (E) component of the SERVQUAL scale and uses only the perceptions (P) component. This implies that higher perceived performance results in higher service quality (Jain and Gupta, 2004). These authors suggest that the SERVPERF scale is superior to the SERVQUAL scale when determining the overall service quality of a firm and when undertaking service quality comparisons across service industries. However, they believe that the SERVQUAL scale is only superior to the SERVPERF scale when diagnosing the areas where there are service quality shortfalls.

- Validity of the five service dimension structure

According to Cronin and Taylor (1992), the conceptualization of the SERVQUAL scale as consisting of the five distinct service quality dimensions as been questioned by Carman (1990). There is doubt whether the individual questions actually describe the five separate service quality dimensions (Cronin and Taylor, 1992).

Caruana *et al.* (2000) say that the SERVQUAL instrument continues to appeal to both academics and practitioners although there have been numerous criticisms about it. Pitt, Watson and Kavan (1995) say, "Because service quality is a significant topic in marketing, SERVQUAL has been subject to considerable debate (e.g., Brown, et al., 1993; Parasuraman, et al. 1993) regarding its dimensionality and the wording of items (Fisk, et al., 1993). Nevertheless, after examining seven studies, Fisk, et al. conclude

that researchers generally agree that the instrument is a good predictor of overall service quality”.

The authors Jiang, Klein and Crampton (2000) say that “recent research has examined the SERVQUAL instrument as a possible measure to assist managers and researchers in evaluating service quality” in the information technology function. They further state that “the SERVQUAL metric may indeed represent accurate views of user perception. As such, the SERVQUAL instrument can serve as a useful indicator for information system managers attempting to identify areas of needed service improvement and to researchers seeking a success measure of information system services”.

The SERVQUAL instrument can also be used by managers “to track competition, examine differences among market segments, and track internal service performance” besides determining service quality perceptions (Winer, 2004).

2.14 Summary

In the beginning of this chapter services and their characteristics was defined. This was followed by the definition of customer service, which according to Zeithaml and Bitner (2000) is defined as “the service provided in support of a company’s core product”.

Zeithaml and Bitner (2000) say, “Customers perceive services in terms of the quality of the service and how satisfied they are overall with their experiences”. These authors further state that while customer satisfaction and service quality, “have certain things in common, satisfaction is generally viewed as a broader concept while service quality assessment focuses specifically on dimensions of service”.

Service quality was also discussed in detail in this chapter. SERVQUAL was identified as the tool that can be used to measure service quality. The SERVQUAL instrument allows for the measurement of service quality along each of the five dimensions of service quality and it also allows for the measurement of organizations overall service quality (Parasuraman *et al.*, 1988).

Although there have been numerous criticisms about the SERVQUAL instrument, the authors Caruana, Ewing and Ramaseshan (2000) are of the view that it still appeals to both academics and practitioners. This view is also supported by Fisk, et al., who stated that researchers generally agree that SERVQUAL is a good predictor of service quality. The following chapter looks at the research methodology used during the study.

CHAPTER THREE - Research Methodology

3.1 Introduction

This chapter focuses on the research methodology that was used to research the problem statement and objectives of this research.

3.2 The Problem Statement

The perceived problem is that Autolab has no idea of how well or badly their respective industry clients rate their service and as a result of this, they may be unaware of the deficiencies or dissatisfaction in the service they provide. Therefore, this study was undertaken with the main aim of measuring the satisfaction levels of Autolab's customers with the quality of service they provide.

3.3 Objectives of the Study

The objectives of the study are to:

- i. Determine the level of satisfaction Autolab's clients have with Autolab.
- ii. Determine whether there is any difference in satisfaction levels between users of the different laboratory information management systems modules.
- iii. Assess gaps between Autolab's clients' perceptions and their expectations of the quality of service provided.
- iv. Ascertain what suggestions Autolab's clients have for service improvement

3.4 The Research Design and Methodology

Cross-sectional studies are carried out once and represent a snapshot of one point in time (Blumberg, Cooper and Schindler, 2005). Therefore, this is a cross-sectional study as the data will be collected from the respondents once at a single point in time.

The data collected for this formal study will be through a quantitative survey. This is due to the research instrument SERVQUAL, which was identified in the literature survey being a quantitative survey instrument.

The benefit of a quantitative research is that the survey is more structured, resulting in the respondents answering the same set of standard questions. Therefore, the information gathered from all respondents is the same. While in qualitative research due to its less structure, the researcher is more likely to miss out some information,

even if he takes the outmost care because of not being able to make a note of all the information available (Blumberg *et al.*, 2005).

The research instrument is discussed below, followed by sample design, data collection strategy and lastly the data analysis.

3.4.1 The Research Instrument

The SERVQUAL research instrument used in this study was identified in the literature survey and is considered to be “one of the preeminent instruments for measuring the quality of services as perceived by the customer” (Van Dyke, *et al.*, 2005). It was developed in 1985 by Parasuraman, Zeithaml and Berry is widely used.

Although there have been some criticisms of the instrument, the authors Caruana, Ewing and Ramaseshan (2000) are of the view that it still appeals to both academics and practitioners. This view is also supported by Fisk, *et al.*, who concluded after examining several studies that researchers generally agree that SERVQUAL is a good predictor of service quality (Caruana, Ewing and Ramaseshan, 2000).

The authors Jiang, Klein and Crampton (2000) say that “the SERVQUAL instrument can serve as a useful indicator for information system managers attempting to identify areas of needed service improvement and to researchers seeking a success measure of information system services”. This implies that since Autolab is an informational technology department, the SERVQUAL instrument is an appropriate instrument to measure service quality.

It consists of two halves with the first half measuring what customers expect the quality of service should be from an excellent company and second half measuring the customers’ perceptions of the quality of service rendered by the company being surveyed. Each half consists of twenty two questions composed along the five dimensions of service quality.

The researcher has modified the SERVQUAL instrument to include a background information section and a miscellaneous section. The background information section will be used to determine customers’ perceptions of service quality between the

different background categories and the miscellaneous section was added to determine the suggestions Autolab's customers have for improving their quality of service.

As a result of the changes to the SERVQUAL instrument, the research instrument now consists of the following sections:

PART A – BACKGROUND INFORMATION

The background information section determines the sugar mill where the respondents are employed, the number of years the respondents have been using the Autolab's Lims systems and the Lims module they are using.

PART B – EXPECTATIONS OF SERVICE QUALITY FROM AN EXCELLENT I.T COMPANY

This section determines what respondents expect the service quality from an excellent I.T company should be. It has twenty-two questions, which are divided into the

- Reliability (questions 1 to 5)
- Responsiveness (questions 6 to 9)
- Assurance (questions 10 to 13)
- Empathy (questions 14 to 18)
- Tangibles (questions 19 to 22)

PART C – PERCEPTIONS OF AUTOLAB SERVICE QUALITY

This section determines the perceptions of the respondents of the service quality provided by Autolab. It also has twenty-two questions like Part B, which are divided into the following five categories:

- Reliability (questions 1 to 5)
- Responsiveness (questions 6 to 9)
- Assurance (questions 10 to 13)
- Empathy (questions 14 to 18)
- Tangibles (questions 19 to 22)

PART D – MISCELLANEOUS

This section has only one question, which asks the respondents for suggestions on how Autolab could improve their quality of service to them.

The modified SERVQUAL questionnaire contains different rating scales. The background information section (Part A) contains multiple choice ratings questions, the expectations of service quality from an excellent I.T company (Part B) section and the perceptions of Autolab service quality (Part C) section contains 5 point Linkert-Scale rating questions. The miscellaneous section (Part D) contains one open ended question.

Responses to the SERVQUAL questionnaires are used to calculate service quality by first determining the gap scores between the twenty two perceptions and expectations statements for each respondent. Thereafter, service quality can be determined for a dimension by calculated the average gap score for all respondents for that dimension. An overall service quality score can be calculated by taking the arithmetic mean score for the five dimensions. Positive scores represented better-than-expected service, whereas negative ones represented poor service. A score of zero implied satisfactory quality ([Asubonteng et al., 1996](#); [Brady et al., 2002](#); [Smith, 1999](#)).

The SERVQUAL instrument was tested for internal validity during the review of the related literature and by obtaining feedback from a few S.A.S.A executives. Obtaining a representative sample will ensure external validity. According to Leedy *et al.* (2005), “Validity refers to the extent to which an instrument measures what it suppose to measure”

3.5 Sample Design

Autolab’s LIMS system is licensed to approximately 166 concurrent users. However, most of these users are data capturers, who have no direct contact with Autolab and therefore will be unable to rate the quality of service provided by them. This study is limited to the LIMS users who are in contact with the Autolab staff and who will be able to rate Autolab’s quality of service. These are mainly the senior employees of the departments that are using the Autolab’s LIMS systems. They represent the population of this study, which are 79 users.

According to Leedy *et al* (2005), the entire population needs to be surveyed if the population size is fewer than 100 people. Therefore, 79 questionnaires will be sent out, which represents the entire population of the study.

3.6 Data Collection

The data collected will only be primary data. Autolab's Zimbabwean customer will be excluded from the survey, due to the crisis in that country. Interviewers located at the fourteen South African sugar mills will be used to distribute and collect questionnaires from respondents selected by the researcher. The researcher hopes that by using these well-trained interviewers, the time and the cost it will take to administer the questionnaires will be lower than if he did it himself. The questionnaires are expected to be returned to the researcher within three weeks from the time it is delivered to the interviewers. A courier company will be used to deliver and collect the questionnaires from the interviewers.

The respondents will be informed by the interviewers and through informed consent letters of the importance of the study and that confidentiality and anonymity of records identifying the respondents as a participant will be maintained by the Graduate School of Business. They will also be informed that their participation is voluntary and they may withdraw from the research at anytime without any negative consequences. The researcher hopes that this will put the respondents at ease, which will result in the questionnaires being filled in truthfully, thereby ensuring the authenticity of the data collected.

3.7 Data Analysis

The data will be analyzed using SPSS (version 13.0) software. This software will be used to do reliability analysis, descriptive and inferential statistics on the data collected.

According to Leedy *et al.* (2005), "reliability is the consistency with which a measuring instrument yields a certain result when the entity being measured hasn't changed". Reliability analysis will be carried out using Cronbach alpha coefficient to determine the internal consistency of each of the five dimensions of the expectations and perceptions part of the SERVQUAL instrument as well as to determine the

overall internal consistency of the instrument. Cronbach alpha coefficient values above 0.60 will indicate favorable internal consistency.

Descriptive frequency and percentage statistics will be used to analyze the demographic data and descriptive central tendency statistics will be carried out to determine if there are any differences in the respondents' responses for all the questions in PART B and PART C of the questionnaires.

Inferential statistics will be carried out to determine the levels of satisfaction Autolab's clients have with Autolab and whether there is any difference in satisfaction levels between users of the different laboratory information management systems modules. This will include calculating the Gap score, which is the discrepancy between expected service and perceived service for each service quality dimension and for overall service quality. Paired T-Test will also be carried out to determine if the Gap scores (differences between the perception and expectation means) are significant using a significance level of 5.

3.8 Delimitations

The study will only survey senior employees that use the different modules of LIMS at the sugar mills. Given the crisis in Zimbabwe, Autolab's Zimbabwean customer will be excluded from the customer survey.

3.9 Summary

The main aim of the study is to measure the satisfaction levels of Autolab's customers with the quality of service they provide. It is assumed that SERVQUAL is an appropriate instrument for measuring Autolab's service quality and the respondents will answer the questionnaires truthfully. Senior employees at the fourteen sugar mills in South Africa that use the different modules of LIMS will be surveyed using the SERVQUAL instrument. They represent the population of this cross-sectional study, which are 79 users. The researcher will distribute the questionnaires to an interviewer at each of these sugar mills, who will administer the questionnaires and gain the co-operation of the various respondents determined by the researcher. The use of these well-trained interviewers will decrease the time and the cost it takes to administer the questionnaires.

Statistical analysis will be conducted using SPSS (version 13.0). Reliability tests will be run using Cronbach coefficient Alpha. The descriptive statistics such as descriptive frequency and percentage statistics will be used to analyze the demographic data. Overall service quality and the service quality for each dimension will be determined by calculating the gap mean scores. Paired T-Test will be carried out to determine if the differences between the perception and expectation means are significant using a significance level of 5.

CHAPTER FOUR – Data Analysis

4.1 Introduction

This chapter outlines the results of the survey of Autolab's customers located at the fourteen sugar mills in South Africa. The results are presented using descriptive and inferential statistics.

4.2 Data Collection

The sample size and sample technique are discussed below.

4.2.1 Sample Size

The sample size was 79, which represents the entire population of the study. A very good response rate was received with 72 questionnaires being completed and returned to the researcher. This represents a response rate of 91 %.

4.2.2 Sample Technique

This study was limited to the LIMS users who are in contact with the Autolab staff and who will be able to rate Autolab's quality of service. These are mainly the senior employees of the departments that are using the Autolab's LIMS systems. They represent the population of this study, which is 79 users.

According to Leedy *et., al* (2005), the entire population needs to be surveyed if the population size is fewer than 100 people. Therefore 79 questionnaires were sent out, which represents the entire population of the study.

4.3 Statement of Results

Descriptive and inferential statistics were used to analyze the data collected. The results of the analysis are presented below.

4.3.1 Descriptive Statistics

4.3.1.1. Descriptive Frequency and Percentage Statistic

The results of the descriptive analysis on the various demographic variables, which are the sugar mill employed, number of years using Lims and the Lims module used are presented below.

Table 4-1: Frequencies and Percentages of Employment at Sugar Mill

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------|-----------|---------|---------------|--------------------|
| Valid | Umzimkulu | 5 | 6.9 | 6.9 | 6.9 |
| | Sezela | 6 | 8.3 | 8.3 | 15.3 |
| | Eston | 5 | 6.9 | 6.9 | 22.2 |
| | Union Co-Op | 4 | 5.6 | 5.6 | 27.8 |
| | Maidstone | 7 | 9.7 | 9.7 | 37.5 |
| | Gledhow | 6 | 8.3 | 8.3 | 45.8 |
| | Darnall | 3 | 4.2 | 4.2 | 50.0 |
| | Amatikulu | 5 | 6.9 | 6.9 | 56.9 |
| | Felixton | 5 | 6.9 | 6.9 | 63.9 |
| | Umfolozi | 5 | 6.9 | 6.9 | 70.8 |
| | Pongola | 6 | 8.3 | 8.3 | 79.2 |
| | Komati | 5 | 6.9 | 6.9 | 86.1 |
| | Malelane | 4 | 5.6 | 5.6 | 91.7 |
| | Noodsberg | 6 | 8.3 | 8.3 | 100.0 |
| | Total | 72 | 100.0 | 100.0 | |

Table 4.1 results show that the highest percentage of the respondents from a single mill was from the Maidstone sugar mill, which was 9.7 percent of the total respondents. The least percentage of respondents from a mill was 4.2 percent, which was from the Darnall sugar mill. Although the difference in the percentage of respondents between the Maidstone sugar mill and the Darnall sugar mill is 5.5 percent, this difference represents only 4 respondents. Darnall had 3 respondents and Maidstone had 4 respondents.

The remainder of the respondents were employed at Umzimkulu sugar mill (6.9 percent), Sezela sugar mill (8.3 percent), Eston sugar mill (6.9 percent), Union Co-Op Ltd (5.6 percent), Gledhow (8.3 percent), Amatikulu (6.9 percent), Felixton (6.9 percent), Umfolozi (6.9 percent), Pongola (8.3 percent), Komati (6.9 percent), Malelane (5.6 percent) and Noodsberg (8.3 percent).

Table 4-2: Frequencies and Percentages of Number of Years Using LIMS

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|---------|-----------|---------|---------------|--------------------|
| Valid | Under 1 | 5 | 6.9 | 6.9 | 6.9 |
| | 1 to 2 | 5 | 6.9 | 6.9 | 13.9 |
| | 3 to 4 | 13 | 18.1 | 18.1 | 31.9 |
| | 5 to 6 | 28 | 38.9 | 38.9 | 70.8 |
| | 7 to 8 | 21 | 29.2 | 29.2 | 100.0 |
| | Total | 72 | 100.0 | 100.0 | |

The results in Table 4.2 show that the majority of the respondents (68.1 percent) have been using Lims for more than five years and 6.9 percent of respondents have been using Lims for less than a 1 year. Since most of the respondents have been using Lims for more than 5 years, the researcher hopes the respondents' assessment of the quality of service provided by Autolab is a true reflection of the service Autolab provides.

6.9 percent of the respondents have been using Lims between 1 and 2 years, 18.1 percent between 3 to 4 years, 38.9 percent between 5 to 6 years and 29.2 percent between 7 to 8 years.

Table 4-3: Frequencies and Percentages of LIMS Modules Used

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|------------------|-----------|---------|---------------|--------------------|
| Valid | Mill Group Board | 6 | 8.3 | 8.3 | 8.3 |
| | Cane Supply | 25 | 34.7 | 34.7 | 43.1 |
| | Cane Testing | 25 | 34.7 | 34.7 | 77.8 |
| | Mill Laboratory | 16 | 22.2 | 22.2 | 100.0 |
| | Total | 72 | 100.0 | 100.0 | |

Table 4.3 results show the majority of the respondents have been using the Cane Supply (34.7 percent) and Cane Testing Lims modules (34.7 percent). This is followed by the Mill Laboratory module, which is used by 22.2 percent of the respondents. The Mill Group Board module is used by 8.3 percent respondents, which makes it the least used Lims module. This is due to the module not being used by all the customers.

4.3.1.2. Central Tendency Statistics

Central tendency statistics was carried out to determine if there were differences in the respondents' responses for all the questions in PART B and PART C of the questionnaires.

The responses for each statement of PART B – Expectations of Service Quality from an Excellent I.T Company and PART C – Perceptions of Autolab Service Quality of the questionnaires were captured using a measurement scale code ranging from 1 to 5.

This measurement scale code must be interpreted as follows:

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

The mean, standard deviation, minimum and maximum values for each statement of PART B and PART C were calculated using the data captured with this code and the results of which, are presented in Table 4.4 for Part B of the questionnaire and in Table 4.5 for Part C of the questionnaire. The results are categorized according to the service quality dimensions that the statements belong to. The five service quality dimensions are reliability, responsiveness, assurance, empathy and tangibles.

Table 4-4: Central Tendency Statistics Results for PART B – Expectations of Service Quality from an Excellent I.T Company

| Dimension | Statement | Minimum | Maximum | Mean | Std. Deviation |
|----------------|-----------|---------|---------|------|----------------|
| Reliability | 1 | 2 | 5 | 5 | .620 |
| | 2 | 2 | 5 | 5 | .484 |
| | 3 | 2 | 5 | 4 | .747 |
| | 4 | 2 | 5 | 5 | .628 |
| | 5 | 2 | 5 | 4 | .861 |
| Responsiveness | 6 | 2 | 5 | 5 | .568 |
| | 7 | 3 | 5 | 5 | .442 |
| | 8 | 4 | 5 | 5 | .387 |
| | 9 | 2 | 5 | 4 | .729 |
| Assurance | 10 | 4 | 5 | 5 | .348 |
| | 11 | 4 | 5 | 5 | .387 |
| | 12 | 4 | 5 | 5 | .419 |
| | 13 | 2 | 5 | 5 | .510 |
| Empathy | 14 | 2 | 5 | 5 | .592 |
| | 15 | 2 | 5 | 5 | .601 |
| | 16 | 2 | 5 | 5 | .645 |
| | 17 | 3 | 5 | 5 | .496 |
| | 18 | 2 | 5 | 5 | .557 |
| Tangibles | 19 | 4 | 5 | 5 | .444 |
| | 20 | 3 | 5 | 4 | .601 |
| | 21 | 3 | 5 | 5 | .624 |
| | 22 | 3 | 5 | 5 | .493 |

The results in Table 4.4 for each dimension reveal that:

➤ **Reliability**

The minimum value for all the statements in this dimension is 2 and the maximum value is 5. The minimum value of 2 indicates that there are respondents whose minimum articulated perception is disagree and the maximum value of 5 indicates that there are respondents whose maximum articulated perception is strongly agree.

The study statements 1, 2 and 4 have mean values of 5, which indicates that the respondents who participated in this project have articulated average perception of strongly agree towards the above mentioned study statements. The study statements 3 and 5 have mean values of 5, which indicates that the respondents have articulated average perception of agree towards the above mentioned study statements.

The study statements 1 to 5 have standard deviation ranging from 0.484 to 0.861. This indicates that the above statements have difference in the respondent's opinions.

➤ Responsiveness

The respondents minimum articulated perception for statements 6 and 9 is disagree; statement 7 is neutral and for statement 8 is agree. This has been indicated by statements 6 and 9 having the minimum value of 2, statement 7 having the minimum value of 3 and statement 8 having the minimum value of 4. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 6, 7 and 8 have mean values of 5, which indicates that the respondents have an articulated average perception of strongly agree towards the above mentioned study statements. The study statement 9 has the mean value of 4, which indicates that the respondents have articulated average perception of agree towards the above mentioned study statement.

The study statements 6 to 9 have standard deviation ranging from 0.387 to 0.729. This indicates that the above statements have difference in the respondent's opinions.

➤ Assurance

The respondents' minimum articulated perception for statements 10, 11 and 12 is agree and for statement 13 is disagree. This has been indicated by statements 10, 11 and 12 having the minimum value of 4 and statement 13 having minimum value of 2. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 10, 11, 12 and 13 have mean values of 5, which indicates that the respondents have an articulated average perception of strongly agree towards the above mentioned study statements.

The study statements 10 to 13 have standard deviation ranging from 0.348 to 0.510. This indicates that the above statements have difference in the respondent's opinions.

➤ Empathy

The respondents' minimum articulated perception for statements 14, 15, 16 and 18 is disagree and for statement 17 is neutral. This has been indicated by statements 14, 15, 16 and 18 having the minimum value of 2 and statement 17 having minimum value of 3. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

All the study statements for this dimension have mean values of 5, which indicates that the respondents have an articulated average perception of strongly agree towards the study statements of this dimension.

The study statements 14 to 18 have standard deviation ranging from 0.496 to 0.645. This indicates that the above statements have difference in the respondent's opinions.

➤ Tangibles

The respondents' minimum articulated perception for statement 19 is agree and for statements 20, 21 and 22 is neutral. This has been indicated by statement 19 having the minimum value of 4 and statements 20, 21, 22 having minimum value of 3. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 19, 21 and 22 have mean values of 5, which indicates that the respondents have an articulated average perception of strongly agree towards the above mentioned study statements. The study statement 20 has the mean value of 4, which indicates that the respondents have articulated average perception of agree towards the above mentioned study statement.

The study statements 19 to 22 have standard deviation ranging from 0.444 to 0.624. This indicates that the above statements have difference in the respondent's opinions.

Table 4-5: Central Tendency Statistics Results for PART C – Perceptions of Autolab Service Quality

| Dimension | Statement | Minimum | Maximum | Mean | Std. Deviation |
|----------------|-----------|---------|---------|------|----------------|
| Reliability | 1 | 1 | 5 | 4 | .868 |
| | 2 | 2 | 5 | 5 | .628 |
| | 3 | 2 | 5 | 4 | .865 |
| | 4 | 2 | 5 | 4 | .859 |
| | 5 | 1 | 5 | 4 | .966 |
| Responsiveness | 6 | 2 | 5 | 4 | .989 |
| | 7 | 3 | 5 | 4 | .650 |
| | 8 | 2 | 5 | 5 | .562 |
| | 9 | 1 | 5 | 4 | .956 |
| Assurance | 10 | 2 | 5 | 5 | .666 |
| | 11 | 3 | 5 | 5 | .503 |
| | 12 | 2 | 5 | 5 | .680 |
| | 13 | 2 | 5 | 5 | .839 |
| Empathy | 14 | 2 | 5 | 5 | .664 |
| | 15 | 1 | 5 | 4 | .997 |
| | 16 | 2 | 5 | 5 | .643 |
| | 17 | 2 | 5 | 4 | .692 |
| | 18 | 2 | 5 | 5 | .668 |
| Tangibles | 19 | 2 | 5 | 4 | .813 |
| | 20 | 2 | 5 | 4 | .822 |
| | 21 | 3 | 5 | 5 | .521 |
| | 22 | 2 | 5 | 4 | .805 |

The results in Table 4.5 for each dimension reveal that:

➤ **Reliability**

The respondents' minimum articulated perception for statements 1 and 5 is strongly disagree and for statements 2, 3 and 4 is disagree. This has been indicated by statements 1 and 2 having the minimum value of 1 and statements 2, 3 and 4 having the minimum value of 2. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 1, 3, 4 and 5 have mean values of 4, which indicates that the respondents who participated in this project have articulated average

perception of agree towards the above mentioned study statements. The study statement 2 has the mean values of 5, which indicates that the respondents have articulated average perception of strongly agree towards the above mentioned study statement.

The study statements 1 to 5 have standard deviation ranging from 0.628 to 0.966. This indicates that the above statements have difference in the respondent's opinions.

➤ Responsiveness

The respondents minimum articulated perception for statements 6 and 8 is disagree, statements 7 is neutral and for statement 9 is strongly disagree. This has been indicated by statements 6 and 8 having the minimum value of 2, statement 7 having the minimum value of 3 and statement 9 having the minimum value of 1. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 6, 7 and 9 have mean values of 4, which indicates that the respondents have an articulated average perception of agree towards the above mentioned study statements. The study statement 8 has the mean value of 5, which indicates that the respondents have articulated average perception of strongly agree towards the above mentioned study statement.

The study statements 6 to 9 have standard deviation ranging from 0.562 to 0.989. This indicates that the above statements have difference in the respondent's opinions.

➤ Assurance

The respondents' minimum articulated perception for statements 10, 12 and 13 is disagree and for statement 11 is neutral. This has been indicated by statements 10, 12 and 13 having the minimum value of 2 and statement 11 having minimum value of 3. The respondents maximum articulated

perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

All the study statements in this dimension have mean values of 5, which indicates that the respondents have an articulated average perception of strongly agree towards the study statements in this dimension.

The study statements 10 to 13 have standard deviation ranging from 0.503 to 0.839. This indicates that the above statements have difference in the respondent's opinions.

➤ Empathy

The respondents' minimum articulated perception for statements 14, 16, 17 and 18 is disagree and for statement 15 is strongly disagree. This has been indicated by statements 14, 16, 17 and 18 having the minimum value of 2 and statement 15 having minimum value of 1. The respondents maximum articulated perceptions for all the statements in this dimension is agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 14, 16 and 18 have mean values of 5, which indicates that the respondents have an articulated average perception of strongly agree towards the above mentioned study statements. The study statements 15 and 17 have mean values of 4, which indicates that the respondents have an articulated average perception of agree towards the above mentioned study statements.

The study statements 14 to 18 have standard deviation ranging from 0.643 to 0.997. This indicates that the above statements have difference in the respondent's opinions.

➤ Tangibles

The respondents' minimum articulated perception for statements 19, 20 and 22 is disagree and for statement 21 is neutral. This has been indicated by statements 19, 20 and 22 having the minimum value of 2 and statement 21

having minimum value of 3. The respondents maximum articulated perceptions for all the statements in this dimension is strongly agree, which is indicated by the maximum value of 5 for all the statements.

The study statements 19, 20 and 22 have mean values of 4, which indicates that the respondents have an articulated average perception of agree towards the above mentioned study statements. The study statement 21 has the mean value of 5, which indicates that the respondents have articulated average perception of strongly agree towards the above mentioned study statement.

The study statements 19 to 22 have standard deviation ranging from 0.521 to 0.822. This indicates that the above statements have difference in the respondent's opinions.

4.3.2 Inferential Statistics

4.3.2.1. Cronbach Alpha Test (Reliability Test)

Cronbach alpha coefficient was used to test the measurement scale for internal consistency. Internal consistency is the degree to which the items that make up the scale are all measuring the same underlying attribute (Pallant, 2005). Measurements scales are tested for reliability to indicate how free it's from random error (Pallant, 2005).

The Cronbach alpha coefficient test was carried out on the expectations and perceptions part of the measurement scale for each of the five dimensions. Table 4.6 is the results of the reliability test, which indicates favorable internal consistency since the Cronbach alpha coefficient is above 0.60 for all the dimensions of the expectations and perceptions part of the measurement scale. This implies that the degree to which items that make the SERVQUAL instrument are all measuring the same underlying attribute is favorable.

Table 4-6: Cronbach Alpha Coefficient Results

| Dimension | Expectations | | Perceptions | |
|----------------|------------------|------------|------------------|-------------|
| | Cronbach's Alpha | N of Items | Cronbach's Alpha | No of Items |
| Reliability | 0.824 | 5 | 0.863 | 5 |
| Responsiveness | 0.619 | 4 | 0.822 | 4 |
| Assurance | 0.644 | 4 | 0.878 | 4 |
| Empathy | 0.761 | 5 | 0.865 | 5 |
| Tangibles | 0.79 | 4 | 0.829 | 4 |
| Overall | .912 | 22 | .952 | 22 |

4.3.2.2. Service Quality Results

The SERVQUAL instrument has 22 questions for the expectation part (PART B) of the questionnaire and 22 questions for the perception part (PART C) of the questionnaire. Respondents' answer to each question was scored from a range of 1 to 5.

This score was used to determine a respondent's evaluation of service quality along each service dimension by calculating the average of the difference between the perception and expectation score for each item in that dimension. An average score for each dimension was then calculated across all respondents to determine the service quality for that dimension. Finally, an overall service quality score was calculated by taking the arithmetic mean score for the five dimensions. These service qualities score for a dimension or overall service quality score is called the Gap score.

Paired-sample t-test was also done to determine if the difference between perceptions and expectations of service quality was significant. Customer perception scores greater than their expectation scores with the Paired-sample t-test results indicating that the difference is significant implies that the customers were satisfied with the service provided by Autolab. Customer perception scores less than their expectation scores with the Paired-sample t-test results indicating that the difference is significant implies that the customers were dissatisfied with the service provided by Autolab.

Table 4.7 below contains the service quality gap mean scores for the individual SERVQUAL instrument questions as well the scores for the various service quality dimensions and the overall service quality score.

Table 4-7: Service Quality Gap Scores

| Dimensions | Statement | Mean | | |
|------------------|-----------|-------------|--------------|------------|
| | | Perceptions | Expectations | Difference |
| Reliability | 1 | 4.25 | 4.69 | -0.44 |
| | 2 | 4.67 | 4.82 | -0.15 |
| | 3 | 4.11 | 4.43 | -0.32 |
| | 4 | 4.28 | 4.67 | -0.39 |
| | 5 | 4.1 | 4.36 | -0.26 |
| | Mean Gap | | | -0.31 |
| Responsiveness | 6 | 4.25 | 4.71 | -0.46 |
| | 7 | 4.5 | 4.79 | -0.29 |
| | 8 | 4.72 | 4.82 | -0.1 |
| | 9 | 4.29 | 4.44 | -0.15 |
| | Mean Gap | | | -0.25 |
| Assurance | 10 | 4.58 | 4.86 | -0.28 |
| | 11 | 4.74 | 4.82 | -0.08 |
| | 12 | 4.71 | 4.78 | -0.07 |
| | 13 | 4.51 | 4.78 | -0.27 |
| | Mean Gap | | | -0.18 |
| Empathy | 14 | 4.60 | 4.63 | -0.03 |
| | 15 | 4.36 | 4.68 | -0.32 |
| | 16 | 4.60 | 4.58 | 0.02 |
| | 17 | 4.50 | 4.75 | -0.25 |
| | 18 | 4.57 | 4.67 | -0.1 |
| | Mean Gap | | | -0.14 |
| Tangibles | 19 | 4.24 | 4.74 | -0.5 |
| | 20 | 4.17 | 4.43 | -0.26 |
| | 21 | 4.69 | 4.57 | 0.12 |
| | 22 | 4.33 | 4.69 | -0.36 |
| | Mean Gap | | | -0.25 |
| Overall Mean Gap | | | | -0.23 |

- **Overall Service Quality Results**

The overall mean gap score in Table 4.6 is negative, which implies Autolab's service quality as perceived by the respondents is less than what they expect. Paired t-test was carried out below to determine if the difference was significant.

By using the central limit theorem, it is assumed that the data was normally distributed since the number of respondents was greater than 30. The pre-requisites for paired t-test were met since the data gathered for service quality perceptions and service quality expectations was from the same respondent (hence paired) and the data was normally distributed.

The results of the paired samples t-test are shown in Table 4.8. The column labelled Sig. (2-tailed) is the probability value, which is 0.000. Since this value is less than significance value of 0.05, it can be concluded that there is a significant difference between the service quality perception mean score and the service quality expectation mean score.

Therefore, since the gap mean score is negative and there is a significance difference between the overall service quality perception mean score and the overall service quality expectation score, it can be concluded that the respondents' perception of service quality provided by Autolab is lower than their expectation of service quality from Autolab.

Table 4-8: Paired Samples Test for Overall Service Quality

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|--------|--|--------------------|-------------------|-----------------------|---|----------|--------|----|--------------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Service Quality Perception - Service Quality Expectation | -4.94444 | 10.33644 | 1.21816 | -7.37339 | -2.51550 | -4.059 | 71 | .000 |

Since the respondents overall service quality perception is less than their expectations, the service quality dimensions has been assessed below.

➤ Service Quality Results by Dimension

The analysis of the service quality results per dimensions has been carried out to determine which dimensions are responsible for the overall service quality perceptions being lower than overall expected service quality.

In Table 4.7 above, it can be seen that the mean gap score across all the service dimensions is negative, which implies that the respondents perceived service quality across all the service dimensions was less than they expected. Paired sample t-test was carried out below to determine if the difference was significant.

The pre-requisites for paired t-test were met since the data gathered for service quality perceptions and service quality expectations was from the same respondent (hence paired) and by using the central limit theorem, it is assumed that the data was normally distributed since the number of respondents was greater than 30. The results of the paired sample t-tests are displayed in Table 4.9.

Table 4-9: Paired Samples Test for Service Quality Dimensions

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|--------|---|--------------------|-------------------|--------------------|---|---------|--------|----|--------------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | Perceived Reliability - Expected Reliability | -1.56944 | 2.91101 | .34307 | -2.25350 | -.88539 | -4.575 | 71 | .000 |
| Pair 2 | Perceived Responsiveness - Expected Responsiveness | -1.00000 | 2.69062 | .31709 | -1.63226 | -.36774 | -3.154 | 71 | .002 |
| Pair 3 | Perceived Assurance - Expected Assurance | -.69444 | 2.23694 | .26363 | -1.22010 | -.16879 | -2.634 | 71 | .010 |
| Pair 4 | Perceived Empathy - Expected Empathy | -.68056 | 3.13915 | .36995 | -1.41822 | .05711 | -1.840 | 71 | .070 |
| Pair 5 | Perceived Tangibles - Expected Tangibles | -1.00000 | 2.00000 | .23570 | -1.46998 | -.53002 | -4.243 | 71 | .000 |

It can be seen in the column Sig. (2-tailed) of table 4.9 that the probability value for all the service dimensions except empathy is less than 0.05. Therefore, the

difference between the expectation and perception mean scores for all dimensions except empathy is significant.

Although the gap mean score is negative for all the service dimensions, it can be concluded that the respondents' perception of service quality provided by Autolab is less than their expectations of service quality for all the service dimensions except the empathy dimension. This is due to the results of the paired t sample test, which states that the mean difference for the empathy dimension is not significant.

Table 4-10: Gap Mean Score per Dimension

| Dimension | Gap Mean Score |
|------------------|-----------------------|
| Reliability | -0.31 |
| Responsiveness | -0.25 |
| Tangibles | -0.25 |
| Assurance | -0.18 |
| Empathy | -0.14 |

It can be seen from the data in table 4.10 that the reliability dimension has the biggest difference in mean score between respondents' expectations and perceptions of quality of service. This is followed by the responsiveness dimension, which has the second biggest difference in mean scores, thereafter the tangibles and assurance dimensions. The empathy dimension has least difference in mean scores and this dimension should not be of concern to Autolab since the difference according to the paired sample t-test is not significant.

Analysis of the items that make up the service quality dimensions has been carried out below to determine the items responsible for the dimensions not meeting the respondents' expectations. The empathy dimension has been excluded because the difference between the respondents' expectations and perceptions is not significant.

➤ **Service Quality Results by Items**

In the following tables (4.11 to 4.12) paired samples tests were carried out to determine if the difference between perceptions and expectations of service quality for the items in the reliability, responsiveness, assurance and tangibles service dimensions were significant.

Table 4-11: Paired Sample Test for the Reliability Service Dimension

| | | Paired Differences | | | | | t | df | Sig. (2-tailed) |
|--------|--|--------------------|-------------------|--------------------|---|-------|-------|----|--------------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | When an Excellent I.T Company promises to do something by a certain time, they will do so. - When Autolab promises to do something by a certain time, they do so. | .444 | .837 | .099 | .248 | .641 | 4.504 | 71 | .000 |
| Pair 2 | When customers have a problem, employees at an excellent I.T company will show sincere interest in solving it - When you have a problem, Autolab shows sincere interest in solving it. | .153 | .597 | .070 | .012 | .293 | 2.171 | 71 | .033 |
| Pair 3 | An excellent I.T company will perform their service right the first time. - Autolab performs a service right the first time. | .319 | .766 | .090 | .139 | .499 | 3.539 | 71 | .001 |
| Pair 4 | An excellent I.T company will provide their service at the time they promise to do so. - Autolab performs the service at the time they promise to do so. | .389 | .865 | .102 | .186 | .592 | 3.815 | 71 | .000 |
| Pair 5 | Reports/records generated by an excellent I.T company will be error-free. - Report/records generated by Autolab are error-free. | .264 | .993 | .117 | .031 | .497 | 2.255 | 71 | .027 |

As it can be seen in the data in table 4.11, the probability values for all the items in the reliability service dimensions are less than 0.05. This implies that the difference between the respondents' perceptions and expectations is significant for this dimension. Therefore, all the items in this service dimension do not meet the respondents' expectations because the respondents' perceptions are significantly lower than their expectations. This should be a big concern to Autolab since according to available literature; the reliability is the most important to customers.

Table 4-12: Paired Sample Test for Responsiveness Dimension

| | | Paired Differences | | | | t | df | Sig. (2-tailed) | |
|--------|--|--------------------|-------------------|--------------------|---|------|-------|--------------------|-------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | | | | Upper |
| Pair 1 | Employees of an excellent I.T company will tell customers exactly when service will be performed. - Employees of Autolab tell you exactly when services will be performed. | .458 | 1.020 | .120 | .219 | .698 | 3.813 | 71 | .000 |
| Pair 2 | Employees of an excellent I.T company will give prompt service to customers. - Employees Autolab give you prompt service. | .292 | .680 | .080 | .132 | .452 | 3.637 | 71 | .001 |
| Pair 3 | Employees of an excellent I.T company will always be willing to help customers. - Employees of Autolab are always willing to help you. | .097 | .675 | .080 | -.061 | .256 | 1.223 | 71 | .225 |
| Pair 4 | Employees of an excellent I.T company will never be too busy to response to customers' request. - Employees of Autolab are never too busy to respond to your requests. | .153 | 1.030 | .121 | -.089 | .395 | 1.259 | 71 | .212 |

The probability values in table 4.12 for the first two pairs in the responsiveness service dimension are less than 0.05. This implies that the ratings of the following perception statements “Employees of Autolab tell you exactly when services will be performed” and “Employees of Autolab give you prompt services, which are lower than what the respondent expects from the quality of service Autolab provides, are significantly different.

Although the difference between the respondents’ perceptions and expectations are lower for the following perception statements “Employees of Autolab are always willing to help you” and “Employees of Autolab are never too busy to respond to your requests”, they are not significant according to the results of the paired sample test.

Table 4-13: Paired Sample Test for Assurance Dimension

| | | Paired Differences | | | | | t | Df | Sig. (2-tailed) |
|--------|---|--------------------|-------------------|--------------------|---|-------|-------|----|--------------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | The behaviour of employees of an excellent I.T company will instill confidence in customers . - The behaviour of employees of Autolab instills confidence in you. | .278 | .716 | .084 | .109 | .446 | 3.290 | 71 | .002 |
| Pair 2 | Customers trust an excellent I.T company. - Autolab is trustworthy. | .083 | .524 | .062 | -.040 | .206 | 1.349 | 71 | .182 |
| Pair 3 | Employees of an excellent I.T company will be consistently courteous to customers. - Employees of Autolab are consistently courteous to you. | .069 | .678 | .080 | -.090 | .229 | .869 | 71 | .388 |
| Pair 4 | Employees of an excellent I.T company will have the knowledge to answer customers' questions. - Employees of Autolab have the knowledge to answer your questions. | .264 | .839 | .099 | .067 | .461 | 2.669 | 71 | .009 |

The data in table 4.13 shows that the probability values for the first and last pairs in the assurance service dimension are less than 0.05. This implies that the ratings of the following perception statements “The behavior of employees of Autolab instills confidence in you” and “Employees of Autolab have the knowledge to answer your questions”, which are lower than what the respondent expects, are significantly different.

Although the ratings of the following perception statements “Autolab is trustworthy” and “Employees of Autolab are consistently courteous to you” are also less than what the respondents expect but according to the results of the paired sample test the difference between the respondents’ expectations and perceptions for these statements is not significant to be considered a shortcoming.

Table 4-14: Paired Sample Test for Tangible Dimension

| | | Paired Differences | | | | t | df | Sig. (2-tailed) |
|--------|--|--------------------|----------------|-----------------|--|--------|----|-----------------|
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference Lower Upper | | | |
| Pair 1 | An excellent I.T company will have modern equipment. - Autolab has modern equipment. | .500 | .822 | .097 | .307 .693 | 5.160 | 71 | .000 |
| Pair 2 | In an excellent I.T company physical facilities are visually appealing. - Autolab's physical facilities are visually appealing. | .264 | .769 | .091 | .083 .445 | 2.912 | 71 | .005 |
| Pair 3 | Employees of an excellent I.T company will be neat in appearance. - Employees of Autolab are neat in appearance. | -.125 | .649 | .076 | -.277 .027 | -1.635 | 71 | .106 |
| Pair 4 | Reports and statements generated by an excellent I.T company are visually appealing. - Reports and statements generated by Autolab are visually appealing. | .361 | .678 | .080 | .202 .520 | 4.521 | 71 | .000 |

It can be seen in table 4.14 that the mean difference for pair 1, pair 2 and pair 4 are positive while pair 3 is negative. The difference in mean values is significant for pair 1, pair 2 and pair 4 since the probability values for these pairs is below 0.05. The mean difference is not significant for pair 3 since the probability value is above 0.05.

This implies that the ratings of the following perception statements “Autolab has modern equipment”, “Autolab’s physical facilities are visually appealing” and “Reports and statements generated by Autolab are visually appealing”, which are lower than what the respondent expects, are significantly different.

The perception statement “Reports and statements generated by Autolab are visually appealing” is the only statement in the SERVQUAL questionnaire where the respondents perception exceeds their expectation ratings. However, according

to the results of the paired sample test the difference between the respondents' expectations and perceptions for these statements is not significant to be considered favorable.

➤ **Service Quality Results by Lims Modules**

The study now investigates if there were differences in perceptions and expectations between the different module users. This will be determined by using Anova tests.

The interpretation rule for Anova tests are as follows:

- i. Probability (Sig.) values less than and equal to 0.05 implies statistically there is significance difference between groups' opinions.
- ii. Probability (Sig.) values greater than 0.05 implies statistically there is no significance difference between groups' opinions.

Table 4-15: One-Way Anova Test Results for the Reliability Service Quality Dimension

| ANOVA | | | | | | |
|-----------------------|----------------|----------------|----|-------------|------|------|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| Perceived Reliability | Between Groups | 9.582 | 3 | 3.194 | .268 | .848 |
| | Within Groups | 809.738 | 68 | 11.908 | | |
| | Total | 819.319 | 71 | | | |
| Expected Reliability | Between Groups | 8.301 | 3 | 2.767 | .397 | .755 |
| | Within Groups | 473.643 | 68 | 6.965 | | |
| | Total | 481.944 | 71 | | | |

The Anova test results in table 4.15 reveal that the probability significance values are 0.848 for the perceived reliability dimension and 0.755 for the expected reliability dimension. This implies statistically there is no significance difference in perceptions and expectations between the different Lims modules user groups' respondents towards the reliability service quality dimension statements because the probability significance values are above 0.05.

Table 4-16: One-Way Anova Test Results for the Responsiveness Service Quality Dimension

| | | ANOVA | | | | |
|--------------------------|----------------|----------------|----|-------------|------|------|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| Perceived Responsiveness | Between Groups | 1.513 | 3 | .504 | .071 | .975 |
| | Within Groups | 485.473 | 68 | 7.139 | | |
| | Total | 486.986 | 71 | | | |
| Expected Responsiveness | Between Groups | .935 | 3 | .312 | .134 | .939 |
| | Within Groups | 158.051 | 68 | 2.324 | | |
| | Total | 158.986 | 71 | | | |

The Anova test results in table 4.16 reveal that the probability significance values for the perceived responsiveness dimension is 0.975 and 0.939 for the expected reliability dimension. This implies statistically there is no significance difference in perceptions and expectations between the different Lims modules user groups' respondents towards the responsiveness service quality dimension statements because the probability significance values are above 0.05.

Table 4-17: One-Way Anova Test Results for the Assurance Service Quality Dimension

| | | ANOVA | | | | |
|---------------------|----------------|----------------|----|-------------|------|------|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| Perceived Assurance | Between Groups | 3.127 | 3 | 1.042 | .322 | .809 |
| | Within Groups | 220.151 | 68 | 3.238 | | |
| | Total | 223.278 | 71 | | | |
| Expected Assurance | Between Groups | 4.313 | 3 | 1.438 | 1.1 | .374 |
| | Within Groups | 92.673 | 68 | 1.363 | | |
| | Total | 96.986 | 71 | | | |

The Anova test results in table 4.17 reveal that the probability significance values are 0.809 for the perceived assurance dimension and 0.374 for the expected assurance dimension. This implies statistically there is no significance difference in perceptions and expectations between the different Lims modules user groups' respondents towards the assurance service quality dimension statements because the probability significance values are above 0.05.

Table 4-18: One-Way Anova Test Results for the Empathy Service Quality Dimension

| ANOVA | | | | | | |
|-------------------|----------------|----------------|----|-------------|-------|------|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| Perceived Empathy | Between Groups | 24.464 | 3 | 8.155 | .903 | .445 |
| | Within Groups | 614.411 | 68 | 9.035 | | |
| | Total | 638.875 | 71 | | | |
| Expected Empathy | Between Groups | 27.794 | 3 | 9.265 | 2.270 | .088 |
| | Within Groups | 277.483 | 68 | 4.081 | | |
| | Total | 305.278 | 71 | | | |

The Anova test results in table 4.18 reveal that the probability significance values for the perceived empathy dimension is 0.445 and 0.088 for the expected empathy dimension. This implies statistically there is no significance difference in perceptions and expectations between the different Lims modules user groups' respondents towards the empathy service quality dimension statements because the probability significance values are above 0.05.

Table 4-19: One-Way Anova Test Results for the Tangible Service Quality Dimension

| ANOVA | | | | | | |
|---------------------|----------------|----------------|----|-------------|-------|------|
| | | Sum of Squares | df | Mean Square | F | Sig. |
| Perceived Tangibles | Between Groups | .669 | 3 | .223 | .036 | .991 |
| | Within Groups | 422.983 | 68 | 6.220 | | |
| | Total | 423.653 | 71 | | | |
| Expected Tangibles | Between Groups | 14.882 | 3 | 4.961 | 1.750 | .165 |
| | Within Groups | 192.771 | 68 | 2.835 | | |
| | Total | 207.653 | 71 | | | |

The Anova test results in table 4.19 reveal that the probability significance values are 0.991 for the perceived tangible dimension and 0.165 for the expected tangible dimension. This implies statistically there is no significance difference in perceptions and expectations between the different Lims modules user groups' respondents towards the tangible service quality dimension statements because the probability significance values are above 0.05.

➤ **Customer Suggestions**

The respondents' suggestions on how Autolab can improve its quality of service to its customers have been categorized and summarized below. The results are as follows:

Training

- Training courses for users should be held on the various Lims modules.
- There should be documentation available for the users of the different Lims modules.
- Autolab staff should always be trained and exposed to latest technology.
- All Autolab employees should have the same level of training and knowledge so if one member of the staff leaves the remaining members will be able to continue providing the same level of service.

Support

- There should be after hours hardware support.
- Employees must pay more attention to detail.
- Employees must be more customers focused.
- Have a dedicated I.T employee to answer telephone calls.
- Employees must always be willing to assist customers.
- Customers must always be able to contact after hours support easily.
- After hours support must be quicker to resolve problems.

Communication

- Email communications should always be customer friendly.
- Customers must be notified of enhancements done to Lims for other customers that could be beneficially to them.
- Customers must always be informed when remote maintenance is done to their Lims systems and the reason for the maintenance.
- Customers must always be provided with an update report every time changes are made to their Lims system.

- Customers must also be informed on the likely completion date of their jobs logged in Autolab's call centre.
- Customers must be informed of any changes within Autolab.
- Customers must also be informed in advance of future expenses related to new equipment.

Staff Retention

- Autolab needs to develop a staff retention strategy as staff turnover affects the knowledge and ability of new employees to meet customer needs.
- Inexperienced employees take longer to solve problems.

Mill Courtesy Visits

- Autolab personal should conduct courtesy calls to customers and sites at least twice a year. Personal visits to centres will assist in improving customer relationship as well as to determine the areas of Lims that needs improvement or difficulties encountered by the users.
- Senior Autolab personal should market Autolab by visiting at least each mill in a season to get feedback for overall improvement.

Workshops/Seminars

- Autolab should hold workshops/seminars where customers and Autolab staff can share information and suggestions on how to improve the system.
- Autolab can also share information on the latest technology applicable to their business.
- The customers can also be informed of new developments in Lims.

Newsletters

- Autolab should create a weekly or monthly newsletter, which informs the users of what Autolab is currently doing, future targets and objectives for continuous improvements.
- The newsletter should also include a how to that section.

System Checks

- Autolab staff should carry out periodic checks on customers Lims to identify problems early.

Repeat Problems

- Recurring problems should be indentified and corrected to prevent reoccurrence.

4.4. Conclusion

This chapter presented the results of the survey, gave a statistical analysis and an interpretation of the data collected from the customers of Autolab.

The SERQUAL instrument was tested for reliability by using the Cronbach alpha coefficient statistic to assess its internal consistency. Internal consistency is the degree to which the items that make up the scale are all measuring the same underlying attribute (Pallant, 2005). Measurements scales are tested for reliability to indicate how free it's from random error (Pallant, 2005). The results of the test indicated favorable internal consistency since the Cronbach alpha coefficient was above 0.60 for all the dimensions of the expectations and perceptions part of the SERVQUAL instrument.

Respondents' answers to each item in the SERVQUAL instrument was scored from a range of 1 to 5 to calculate Autolab's service quality rating. According to Parasuraman *et al.* (1988), service quality is calculated for a service quality dimension by averaging the difference scores on items making up that dimension. The difference score for an item, which represents perceived quality, is defined as the difference between the ratings on the corresponding perception and expectation statements (Parasuraman *et al.*, 1988).

In Table 4.7, it can be seen that the difference scores (gap scores) for each service quality dimension was negative. Paired-samples t-test was carried out to determine if the difference between the perception and expectation mean scores was significant. According to Pallant (2005), the difference between two mean scores is significant if the probability value is less than 0.05. The results of the test can be seen in Table 4.9, which shows that the probability values is less than 0.05 for all the service quality dimensions except the Empathy dimension. This indicates that the difference in mean

scores was significant for all the service quality dimensions except the Empathy dimension. This implies that Autolab's customers were dissatisfied with the service they provided along the reliability, responsiveness, tangibles and assurance service quality dimensions.

According to Parasuraman *et al* (1988), overall service quality is the average difference score across all five dimensions. In Table 4.7, it can be seen that the overall difference in mean scores (gap scores) was negative. The results of the Paired-sample t-test can be seen in Table 4.8, which shows that the probability value is less than 0.05 indicating that the difference in perceptions and expectations mean scores of service quality was significant. This implies that Autolab's customers were dissatisfied with the overall service quality provided by Autolab.

Anova tests were also carried out to determine if there were differences in perceptions and expectations between the different module users for all the service quality dimensions. According to Pallant (2005), there will be a statistically significance difference between the different users opinions if the probability (Sig.) values was less than and equal to 0.05. The results of the Anova tests can be seen in tables 4.15 to 4.19, which show that the probability values are greater than 0.05 for all the service quality dimensions between the different module users. This implies that the different module users had the same opinion of the quality of service provided by Autolab.

Respondents' suggestions were also categorized and summarized in this chapter.

In the following chapter conclusions are drawn and recommendations are made as to how Autolab can improve its levels of service of its clients.

CHAPTER FIVE – Conclusions and Recommendations

5.1 Introduction

This chapter highlights the results of the survey, draws conclusions and provides recommendations to address identified shortcomings in terms of Autolab's service levels. In addition suggestions for further research are made.

5.2 Research Findings

This study was undertaken because Autolab had no idea of how well or badly their respective industry clients rated their service. As a result of this, Autolab may be unaware of any deficiencies or customer dissatisfaction in the service they provide.

The SERVQUAL instrument was used to survey the respondents who are senior employees employed at the fourteen sugar mills in South Africa. These respondents are Autolab LIMS users who communicate with Autolab employees and are in position to evaluate the service provided by Autolab. Autolab's Zimbabwean customer was excluded from the survey due to the crisis in that country.

Assessments of the objectives of the study are as follows:

5.2.1 Objective One: Determine the level of satisfaction Autolab's clients have with Autolab.

The analysis of the survey data indicated that Autolab's customers' expectations of service quality were not met. This was indicated by the overall SERVQUAL mean gap score being negative and the paired t-test revealing that the negative difference in overall mean scores between customers' expectations and perceptions of service quality was significant.

It must be noted that the negative gap scores are due to the respondents having very high expectations of service quality rather than Autolab delivering poor quality service. This can be seen by the overall perception and expectation mean scores being greater than 4.

Recommendations

Autolab should advise their clients to have realistic expectations of service quality. However, if Autolab wants to improve its quality of service it should consider using

the various suggestions made below by the respondents and the researcher to achieve this.

5.2.2 Objective Two: Determine whether there is any difference in satisfaction levels between users of the different Laboratory Information Management Systems modules.

The respondents surveyed comprised of 34.7 percent Cane Supply module users, 34.7 percent Cane Testing module users, 22.2 percent Mill Laboratory module users and 8.3 percent, the Mill Group Board module users. As can be seen, the Mill Group Board users were the least of the respondents surveyed. This is due to there being fewer Mill Group Board users than there are users of the other modules.

As mentioned above in the first objective, the respondents perceived the overall service quality to be lower than their expectations. Anova tests were carried out to determine if the perceptions ratings being lower than the expectations ratings are the same for the different module users. The results of the Anova tests revealed that the lower perception ratings were the same for all of the different module users.

Recommendations

As mentioned above in the recommendations for the first objective, if Autolab wants to improve its quality of service it should consider using the various suggestions made below by the respondents and the researcher to achieve this.

The respondents were clients of Autolab and given the sample size in relation to the population; the recommendations and the suggestions made by them are worthy of serious consideration by Autolab. Implementing these recommendations should contribute to greater service quality delivery and thus enhanced customer satisfaction.

5.2.3 Objective Three: Assess gaps between Autolab's clients' perceptions and their expectations of the quality of service provided.

Detailed analysis of the data revealed that the customers' expectations were significantly lower from their perceptions for all the service quality dimensions except the empathy service dimension. Although, the customers' perceptions were lower than their expectations for the empathy service quality dimension, the difference between perceptions and expectations was found not to be statistically different. The gap score

which is the difference between the perception and expectation mean scores can be seen in table 5.1 for each service quality dimension.

Table 5-1: Gap Mean Score per Dimension

| Dimension | Gap Mean Score |
|------------------|-----------------------|
| Reliability | -0.31 |
| Responsiveness | -0.25 |
| Tangibles | -0.25 |
| Assurance | -0.18 |
| Empathy | -0.14 |

All the gap mean scores are negative with the reliability dimension having the biggest gap between perceptions and expectations followed by the responsiveness, tangibles, assurance and lastly the empathy dimension.

The service quality items responsible for the perception ratings of their dimension being lower than their expectation ratings are:

- Reliability
 - When Autolab promises to do something by a certain time, they do so.
 - When you have a problem, Autolab shows sincere interest in solving it.
 - Autolab performs a service right the first time.
 - Autolab performs the service at the time they promise to do so.
 - Report/records generated by Autolab are error-free.
- Responsiveness
 - Employees of Autolab tell you exactly when services will be performed.
 - Autolab gives you prompt service.
- Assurance
 - The behaviour of employees of Autolab instills confidence in you
 - Employees of Autolab have the knowledge to answer your questions.
- Tangibles
 - Autolab has modern equipment
 - Autolab's physical facilities are visually appealing.

- Reports and statements generated by Autolab are visually appealing.

Recommendations

Recommendations to address the shortcomings identified when assessing this objective are listed below:

- Autolab support employees and management must not be influenced by unrealistic demands from customers when agreeing to service delivery times. Service delivery times should only be set after considering the current workload of the support employees and after all the necessary information for the service request has been gathered. This will ensure that the service is delivered at the time promised by Autolab.
- Autolab management needs to ensure that all its support employees are aware of the importance of excellent customer service delivery and the consequences of the lack of it. It might be necessary to send some of these employees on customer service training courses. Hopefully, this will result in the employees being more customer-orientated focused and increase their willingness to help the customers.
- Employees should also be trained so that they can perform their tasks efficiently and correctly. Performance management should be implemented so that the employees' developmental needs and areas of weaknesses can be identified and corrected.
- All reports or records generated by Autolab should be checked for errors before sent to the customers.
- Autolab support employees and management should increase their communications with their customers. Customers must be regularly informed on the likely completion date of their service requests logged in Autolab's call centre.
- The time it takes to attend to and complete service requests needs to be monitored to determine the reasons for service delays. Service delays could be due to the workload being too much for the employees or the employees need training or just inadequate performance by the employees.

- Autolab management needs to develop a staff retention strategy as staff turnover affects the knowledge and ability of new employees to meet customer needs. Inexperienced employees take longer to solve problems.
- Training needs of employees and customers needs to be identified to address inadequacies. Training customers to be more self-reliant, will decrease the workload of Autolab employees resulting in an increase response to service requests.
- Autolab management should not be concerned that their customer perception ratings of the statement that “Autolab’s physical facilities were visually appealing” were below their expectations because the customers rarely visit their premises. Communications between Autolab employees and its customers are mainly through telephone conversations, email or visits by Autolab employees to mills.
- Autolab employees should check if the reports generated by their Lims are visually appealing.

5.2.4 Objective Four: Ascertain what suggestions Autolab’s clients have for service improvement.

The respondents’ suggestions on how Autolab can improve its quality of service to its customers have been categorized and summarized below. The results are as follows:

- Training
 - Training courses for end users should be held on the various Lims modules. Training will give these users a better understanding of how the various modules work. This will help them make better use of the functionality provided by these modules. Hopefully, this will decrease the need for end user support from Autolab.
 - There should be printed or online documentation available for the users of the different Lims modules dealing with FAQs or how to solve general glitches.
 - Autolab staff should always be trained and exposed to latest technology.

- All Autolab employees should have the same level of training and knowledge so if one member of the staff leaves the remaining members will be able to continue providing the same level of service.
- Support
 - There should be after hours hardware support.
 - Employees must pay more attention to detail.
 - Employees must be more customer focused.
 - A dedicated I.T employee should be available to answer telephone calls from customers who need technical assistance.
 - Employees must always be willing to assist customers.
 - Customers must always be able to contact after hours support easily.
 - After hours support must be quicker to resolve problems.
- Communication
 - Email communications should always be customer friendly.
 - Customers must be notified of enhancements done to Lims for other customers that could be beneficial to them.
 - Customers must always be informed when remote maintenance is going to be undertaken to their Lims systems and the reason for the maintenance.
 - Customers must always be provided with an update report every time changes are made to their Lims system.
 - Customers must also be informed on the likely completion date of their jobs logged in Autolab's call centre.
 - Customers must be informed of any changes within Autolab.
 - Customers must also be informed in advance of future expenses related to new equipment.
- Staff Retention
 - Autolab needs to develop a staff retention strategy as staff turnover affects the knowledge and ability of new employees to meet customer needs.
 - Inexperienced employees take longer to solve problems.
- Mill Courtesy Visits
 - Autolab personal should conduct courtesy calls to customers and sites at

least bi-annually. Personal visits to centres will assist in improving customer relationship as well as determining the areas of LIMS that need improvement or difficulties encountered by the users.

- Senior Autolab personnel should market Autolab by visiting all the mills at least once in a season to get feedback for overall improvement.
- Workshop/Seminars
 - Autolab should hold workshops/seminars where customers and Autolab staff can share information and suggestions on how to improve the system.
 - Autolab can also share information on the latest technology applicable to their business.
 - The customers can also be informed of new developments in Lims.
- Newsletters
 - Autolab should create a weekly or monthly newsletter, which informs the users of what Autolab is currently doing, and define future targets and objectives for continuous improvements.
 - The newsletter should also include a 'how to' section.
- Systems Checks
 - Autolab staff should carry out periodic checks on customers Lims to identify problems early. Problems with Lims can stop a sugar mill from crushing, therefore it is important that problems are sorted out very quickly or, at the least, before they become too severe.
- Repeat Problems
 - Recurring problems should be identified and corrected. Re-engineering might be necessary to prevent re-occurrence.

Recommendations

Autolab should consider the suggestions made by the respondents and determine which suggestions could be used to improve its service quality.

5.3 Suggestions for Future Research

A longitudinal study should be undertaken in a year's time to determine if Autolabs' service levels have improved. Autolab's Zimbabwean customers should also be included in the sample for this study if the economic and political conditions in Zimbabwe have improved.

5.4 Conclusion

This research was undertaken to measure Autolabs' customers' present levels of satisfaction. The SERVQUAL instrument identified in the literature survey was used to measure the customers' satisfaction levels. According to Leedy *et., al* (2005), the entire population of a study needs to be surveyed if it is less than 100. Therefore, the entire population of this study which was 79 users was surveyed. However, only 72 respondents from the various sugar mills completed and returned the questionnaires, which represents a very good response rate of 91 %. Given the circumstance the response rate was exceptionally good. From a statistical aspect the results are not as scientifically sound as would be the case with a 100 % response. In spite of this the results are noteworthy and credible. Autolab is thus advised, in the light of the above, to monitor implementation of these recommendations closely in order to deal with any deviations from the expected result early.

Analysis of the data revealed that the objectives of the study were met. The overall satisfactions levels of the customers were significantly lower than their expectations. This was the same for the users of the different laboratory information management systems modules. The assessment of the low satisfaction levels revealed that the customers' perception ratings were significantly lower than expectations for all but one of the service quality dimensions. Although, the customers' perception of Autolabs' service quality was high, it was lower than the expectations of service quality. This was due to their expectations of service quality being very high.

The researcher has suggested that should Autolab accept the findings of this research and decides to reduce the gap between the customers' perceptions and expectations; it must consider using the various suggestions made by the respondents and the researcher to achieve this. It must also be pointed out that due to the small-scale

nature of this study, it could be that the results are not statistically sound and hence implementation of recommendations should be done with caution and must be closely monitored. However, the fact that only 1 mill out of the total of 15 mills was not included in the study (Zimbabwe), does lend support to statistical credibility as the response is 14 out of the total population of 15 which is very good.

As mentioned above, the main aim of the study was to determine the satisfaction levels of Autolabs' customers. This was achieved and the findings of the study indicated that the customers' satisfaction levels were lower than their expectations.

The researcher has made suitable recommendations for Autolab to improve the quality of service that it renders to its clients and as such this study is concluded.

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APPENDICES

Appendix 1 – Research Approval

| | |
|---|--|
| SOUTH AFRICAN SUGAR ASSOCIATION | |
| INFORMATION SYSTEMS & FACILITIES | |
| AC\TH\G151.08 12 June 2008 | |
| University of Kwazulu-Natal Graduate School of Business Durban 4000 | |
| Dear Mrs. Christel Haddon | |
| RE: RESEARCH APPROVAL | |
| This letter serves as confirmation that Mr. Selvan Velayudan (203520052) has been granted approval by his employer to conduct the following research: | |
| "Customers Expectation and Perception of the Level of Service Provided by Autolab" | |
| Yours Faithfully | |
|  | |
| Adrian Coreejas General Manager - Information Systems & Facilities Management | |

Appendix 2 – Informed Consent Letter

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS

AUTOLAB CUSTOMER SURVEY

Dear Respondent,

MBA Research Project

Researcher: Selvan Velayudan (082 327 1596)

Supervisor: Alec Bozas (082 334 4477)

Autolab Manager: Rob Niemeyer (082 327 1595)

I, Selvan Velayudan am a MBA student, at the Graduate School of Business, of the University of Kwazulu Natal. You are invited to participate in a research project entitled Customers Expectation and Perception of the Level of Service Provided by Autolab. The aim of this study is to determine the level of satisfaction of Autolab's customers.

Through your participation I hope to understand the areas of dissatisfaction identified with the quality of the service provided by Autolab. The results of the survey are intended to contribute towards improving the quality of service provided by Autolab.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business, UKZN.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me, my supervisor or Rob Niemeyer at the numbers listed above.

The survey should take you about 15-20 minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's signature_____ Date_____

CONSENT

I _____ the undersigned have read and understand the above information. I hereby consent to participate in the study outlined in this document. I understand that participation is voluntary and that I may withdraw at any stage of the process.

Participant's signature_____

Date_____

Appendix 3 – Questionnaire

UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS

MBA Research Project

Researcher: Selvan Velayudan (082 327 1596)

Supervisor: Alec Bozas (082 334 4477)

Autolab Manager: Rob Niemeyer (082 327 1595)

AUTOLAB CUSTOMER SURVEY

The purpose of this survey is to elicit information from the customers of Autolab regarding their expectations and perceptions of the quality of service provided by Autolab. The information and ratings you provide us will go a long way in helping us identify areas of satisfaction and concern in the service we provide. The questionnaire should only take 15-20 minutes to complete. In this questionnaire, you are asked to indicate what is true for you, so there are no “right” or “wrong” answers to any question. Work as rapidly as you can. If you wish to make a comment you may write it directly on the booklet itself. Make sure not to skip any questions. Thank you for participating!

PART A – BACKGROUND INFORMATION

Please mark your response with a tick or a cross.

1. I am employed at the following sugar mill

- | | | |
|--------------------------------------|------------------------------------|-----------------------------------|
| <input type="checkbox"/> Umzimkulu | <input type="checkbox"/> Sezela | <input type="checkbox"/> Eston |
| <input type="checkbox"/> Union Co-Op | <input type="checkbox"/> Maidstone | <input type="checkbox"/> Gledhow |
| <input type="checkbox"/> Darnall | <input type="checkbox"/> Amatikulu | <input type="checkbox"/> Felixton |
| <input type="checkbox"/> Umfolozi | <input type="checkbox"/> Pongola | <input type="checkbox"/> Komati |
| <input type="checkbox"/> Malelane | <input type="checkbox"/> Noodsberg | |

2. I have been using Autolab’s laboratory information management system (LIMS) for the following number of years

- | | | |
|----------------------------------|---------------------------------|---------------------------------|
| <input type="checkbox"/> Under 1 | <input type="checkbox"/> 1 to 2 | <input type="checkbox"/> 3 to 4 |
| <input type="checkbox"/> 5 to 6 | <input type="checkbox"/> 7 to 8 | |

3. I am currently using the following module of Autolab’s laboratory information management system (LIMS)

- | | |
|---|--|
| <input type="checkbox"/> Mill Group Board | <input type="checkbox"/> Cane Supply |
| <input type="checkbox"/> Cane Testing | <input type="checkbox"/> Mill Laboratory |

PART B – EXPECTATIONS OF SERVICE QUALITY FROM AN EXCELLENT I.T COMPANY

The statements below determine what you expect from an I.T Company that provides excellent service. The statements are categorized along the five dimensions of service quality, which are reliability, responsiveness, assurance, empathy and tangibles.

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements describing what an *EXCELLENT I.T COMPANY* should do by placing a check mark in the appropriate box.

| Reliability | | | | | |
|-----------------------|----------------------|-----------|-------------------|-------------------|---|
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 1. When an excellent I.T company promises to do something by a certain time, they will do so. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 2. When customers have a problem, employees at an excellent I.T company will show sincere interest in solving it. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 3. An excellent I.T company will perform their service right the first time. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 4. An excellent I.T company will provide their service at the time they promise to do so. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 5. Reports/records generated by an excellent I.T company will be error-free. |
| Responsiveness | | | | | |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 6. Employees of an excellent I.T company will tell customers exactly when services will be performed. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 7. Employees of an excellent I.T company will give prompt service to customers. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 8. Employees of an excellent I.T company will always be willing to help customers. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 9. Employees of an excellent I.T company will never be too busy to respond to customers' requests. |

| Assurance | | | | | |
|-------------------|-------------------|-----------|----------------|----------------|--|
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 10. The behavior of employees of an excellent I.T company will instill confidence in customers. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 11. Customers trust an excellent I.T company. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 12. Employees of an excellent I.T company will be consistently courteous to customers. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 13. Employees of an excellent I.T company will have the knowledge to answer customers' questions. |
| Empathy | | | | | |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 14. An excellent I.T company will give customers individual attention. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 15. An excellent I.T. company will have operating hours, which are convenient for all their customers. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 16. An excellent I.T company will have employees who give customers personal attention. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 17. An excellent I.T company will have the customer's best interest at heart. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 18. Employees of an excellent I.T company will understand the specific needs of their customers. |
| Tangibles | | | | | |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 19. An excellent I.T company will have modern equipment. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 20. In an excellent I.T company physical facilities are visually appealing. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 21. Employees of an excellent I.T company will be neat in appearance. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 22. Reports and statements generated by an excellent I.T company are visually appealing. |

PART C – PERCEPTIONS OF AUTOLAB SERVICE QUALITY

The statements below determine your perception/actual experience in the quality of service provided by Autolab. The statements are categorized along the five dimensions of service quality, which are reliability, responsiveness, assurance, empathy and tangibles.

INSTRUCTIONS: Please rate how strongly you agree or disagree with each of the following statements by describing the quality of service you receive from **AUTOLAB** by placing a check mark in the appropriate box.

| Reliability | | | | | |
|-----------------------|-------------------|-----------|----------------|----------------|---|
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 1. When Autolab promises to do something by a certain time, they do so. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 2. When you have a problem, Autolab shows sincere interest in solving it. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 3. Autolab performs the service right the first time. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 4. Autolab provides the service at the time they promise to do so. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 5. Reports/records generated by Autolab are error-free. |
| Responsiveness | | | | | |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 6. Employees of Autolab tell you exactly when services will be performed. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 7. Employees of Autolab give you prompt service. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 8. Employees of Autolab are always willing to help you. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 9. Employees of Autolab are never too busy to respond to your requests. |
| Assurance | | | | | |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 10. The behaviour of employees of Autolab instills confidence in you. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 11. Autolab is trustworthy. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 12. Employees of Autolab are consistently courteous to you. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 13. Employees of Autolab have the knowledge to answer your questions. |

| Empathy | | | | | |
|-------------------|-------------------|-----------|----------------|----------------|---|
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 14. Autolab gives you individual attention. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 15. Autolab has operating hours, which are convenient for you |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 16. Autolab employees give you personal attention. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 17. Autolab has your best interest at heart. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 18. Employees of Autolab understand your specific needs. |
| Tangibles | | | | | |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 19. Autolab has modern equipment. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 20. Autolab's physical facilities are visually appealing. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 21. Employees of Autolab are neat in appearance. |
| Strongly Disagree | Somewhat Disagree | Undecided | Somewhat Agree | Strongly Agree | 22. Reports and statements generated by Autolab are visually appealing. |

PART D - MISCELLANEOUS

1. Please state below any suggestions you have on how Autolab could improve its services to you_____

[illegible]

End of the Questionnaire

Thank you for taking the time to complete the questionnaire.

Appendix 4 – Ethical Clearance



RESEARCH OFFICE (GOBAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 – 2603587
EMAIL: ximbap@ukzn.ac.za

11 AUGUST 2008

MR. S VELAYUDAN (203520052)
GRADUATE SCHOOL OF BUSINESS

Dear Mr. Velayudan

ETHICAL CLEARANCE APPROVAL NUMBER: HSS/0392/08M

I wish to confirm that ethical clearance has been approved for the following project:

"Customers expectation and perception of the level of service provided by Autolab"

PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years

Yours faithfully

.....
MS. PHUMELELE XIMBA

cc: Supervisor (Alec Bozas)
cc: Mrs. C Haddon