

# Measuring the performance of service departments : an internal service management approach

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MEASURING THE PERFORMANCE OF SERVICE  
DEPARTMENTS: AN INTERNAL SERVICE  
MANAGEMENT APPROACH

H. H. J. KANG

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# **Measuring the Performance of Service Departments: An Internal Service Management Approach**

**By**

**Helen Hyon Ju Kang**



July, 1999

A thesis submitted in partial fulfilment of the requirements for the degree of  
Master of Commerce (Honours) of the University of New South Wales.

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This study was motivated by the recent interest in internal services as many organisations search for new ways to compete more effectively in today's ever-growing markets. As a result, internal service management, which includes measuring the performance of internal services, has become one of the more critical aspects of organisational control. Consequently, the development of Performance Measurement (PM) systems for internal services has become imperative.

This study developed and tested a conceptual model and a related PM system for internal services based on the service quality 'gaps model' and SERVQUAL, the service quality measurement instrument, introduced by Parasuraman, Zeithaml & Berry (PZB) in the mid 1980s. Furthermore, the service performance of an IT department (TSG) was measured using this modified PM system by conducting a survey in the Faculty of Commerce and Economics at one of the leading universities in Australia.

Although the current study found that the concept of service quality and the SERVQUAL instrument can be applied in internal services as an alternative PM system, it also raised two very important questions. Firstly, the dimensionality of service used in SERVQUAL needs more testing to be applied in internal services. Secondly, the relative importance of each of the SERVQUAL questions to both customers and suppliers of service must be considered in more detail, before the generalisability of the SERVQUAL instrument can be established.

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## ***ABSTRACT***

This study was motivated by the recent interest in internal services as many organisations search for new ways to compete more effectively in today's ever-growing markets. As a result, internal service management, which includes measuring the performance of internal services, has become one of the more critical aspects of organisational control. Consequently, the development of Performance Measurement (PM) systems for internal services has become imperative.

This study developed and tested a conceptual model and a related PM system for internal services based on the service quality 'gaps model' and SERVQUAL, the service quality measurement instrument, introduced by Parasuraman, Zeithaml & Berry (PZB) in the mid 1980s. Furthermore, the service performance of an IT department (TSG) was measured using this modified PM system by conducting a survey in the Faculty of Commerce and Economics at one of the leading universities in Australia.

Although the current study found that the concept of service quality and the SERVQUAL instrument can be applied in internal services as an alternative PM system, it also raised two very important questions. Firstly, the dimensionality of service used in SERVQUAL needs more testing to be applied in internal services. Secondly, the relative importance of each of the SERVQUAL questions to both customers and suppliers of service must be considered in more detail, before the generalisability of the SERVQUAL instrument can be established.



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# **CHAPTER 1**

## **INTRODUCTION**

*"Convenience of measurement is not a good enough reason for using the method that offers it", (Paul A. Strassmann, 1985)*

### **1.1 Introduction**

As many organisations search for ways to compete more effectively in today's ever-growing markets, managers are giving more attention to internal services. In recent years, internal services such as Information Technology (IT) have become increasingly capital-intensive and extremely expensive. As a result, internal service management, which includes managing employees who alternatively act as customers and providers of internal services, and measuring the performance of their internal services, has become one of the more critical aspects of organisational control.

Unfortunately, the applicability of traditional performance measures in the internal services setting is at best questionable. Indeed, organisations especially have struggled with traditional measures to reflect the performance of service organisations and their functions. As a result, there has been a call for new types of performance indicators. One such alternative measure, which recently has become quite popular, is service quality.

The concept of service quality originated from the field of marketing, which proposes that there is a need for organisations to understand and measure the customers' expectation of service. While it has been applied extensively in the external services setting, less discussed is the application of service quality in the internal services setting and the providers (suppliers) and receivers (customers) of internal services.

In this study, a conceptual model of service quality is developed for internal services, and based on this model, the study introduces a new Performance Measurement (PM) system designed to measure the service performance of internal departments. The new PM system is then applied to measure the performance of an internal service department - an IT department at one of the largest universities in Australia.

## ***1.2 Management Control and Performance Measurement***

Performance Measurement (PM) is an essential part of any system of feedback control. All organisations need to measure their performance in order to control and manage their activities. Indeed, PM systems historically were developed as means of monitoring and maintaining organisational control, which is the process of ensuring that an organisation pursues strategies that lead to the achievement of overall goals and objectives. That is, an evaluation of performance, whether *ex ante* or *ex post*, is central to the issue of organisational control; *Wilson & Chua (1993)*. Indeed, the importance of PM systems in organisational control has long been acknowledged by both researchers and managers:



*"You cannot measure what is not defined. You also cannot tell whether you have improved something if you have not measured its performance." - Strassmann (1985)*

*"When you can measure what you are speaking about and express it in numbers, you know something about it....(otherwise) your knowledge is a meagre and unsatisfactory kin; it may be the beginning of knowledge, but you have scarcely in thought advanced to the stage of science." - Lord Kelvin, quoted in Heim & Compton (1992)*

*"You can't manage what you can't measure." - Stone & Banks (1997)*

Furthermore, in order for organisations to ensure achievement of their goals and objectives, PM systems are used to evaluate and control a range of functions, systems and processes within organisations. For example, they are used to compare the performance of different divisions, plants, departments, teams and individual employees; *Ghalayini & Noble (1996)*. Well-designed PM systems can serve as a link in the chain from suppliers through internal departments to external customers and stakeholders. They can turn department rivalries into cross-functional teams that work on common goals; *Lynch & Cross (1995)*.

Although the importance of PM in the organisational control process has never been in doubt, senior managers in a broad range of industries recently have recognised that new strategies and competitive realities in today's

markets demand changes to traditional PM systems. Much of the criticisms of traditional PM systems stem from their failure to measure and monitor multiple dimensions of performance by concentrating almost exclusively on financial measures.

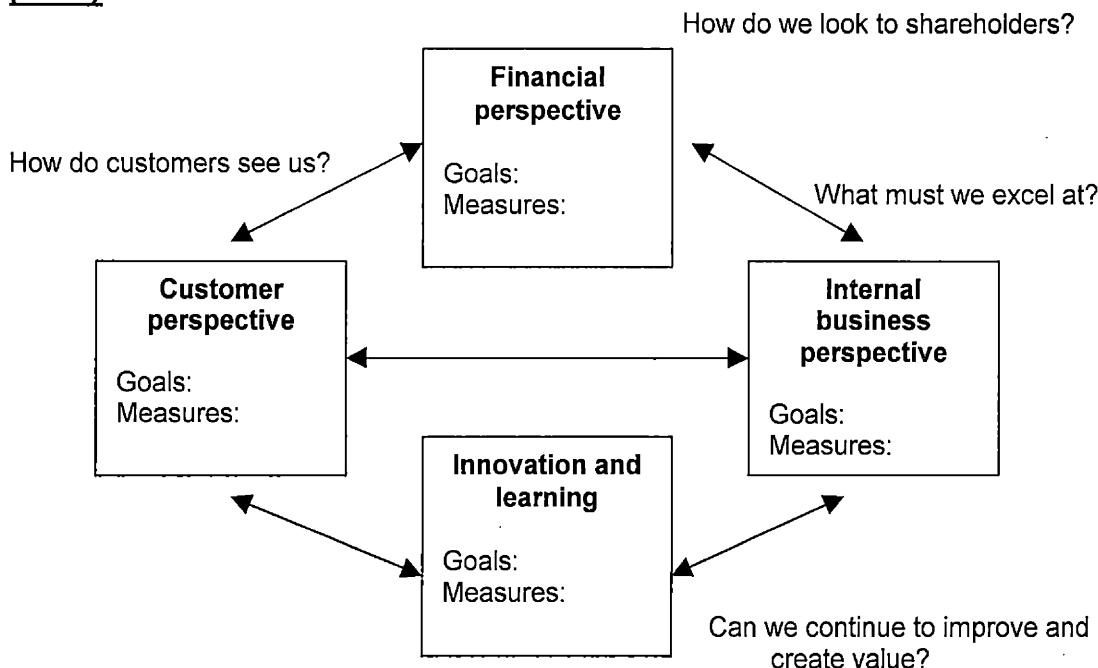
This change can be clearly seen in the literature concerning PM; *Ghalayini & Noble (1996)*. From the late 1880s through to the 1980s, the emphasis was on the financial measures such as profit and ROI. From the late 1980s, the emphasis has been on a range of non-financial measures of performance. This reorientation is the result of the changes in the world markets. In today's global markets, organisations have shifted their strategic priorities from low cost production to quality, flexibility, innovations, the introduction of new technologies and philosophies of production management, resulting in the need for new PM systems.

However, this change does not mean that financial measures are no longer used. According to Eccles (1991), there has been a shift of focus from treating financial figures as *the* foundation for PM systems to treating them as just *one* among a broader set of measures. That is, organisations must now be prepared to disregard the notion that '*when conflicts arise, financial considerations win out*'. Indeed, they must now actively seek for alternative, non-financial measures, which can reflect the *real* performance of their organisations. That is, to get a hit, you have to watch the ball, not the scoreboard; *Fisher (1992)*.

As a result, a number of alternative PM models based on non-financial measures of performance have been developed in the last few years. Arguably, the most universally recognised alternative PM model is the Balanced Scorecard developed by Kaplan & Norton (1992). It is an integrated PM system that incorporates strategic, operational and financial measures together, and is based on 4 fundamental questions (see Figure 1.1):

- How do customers see us? (Customer perspective);
- What must we excel at? (Internal perspective);
- Can we continue to improve and create value? (Innovation and learning perspective); and,
- How do we look to shareholders? (Financial perspective).

**Figure 1.1: The Balanced Scorecard - adapted from Kaplan & Norton (1992)**

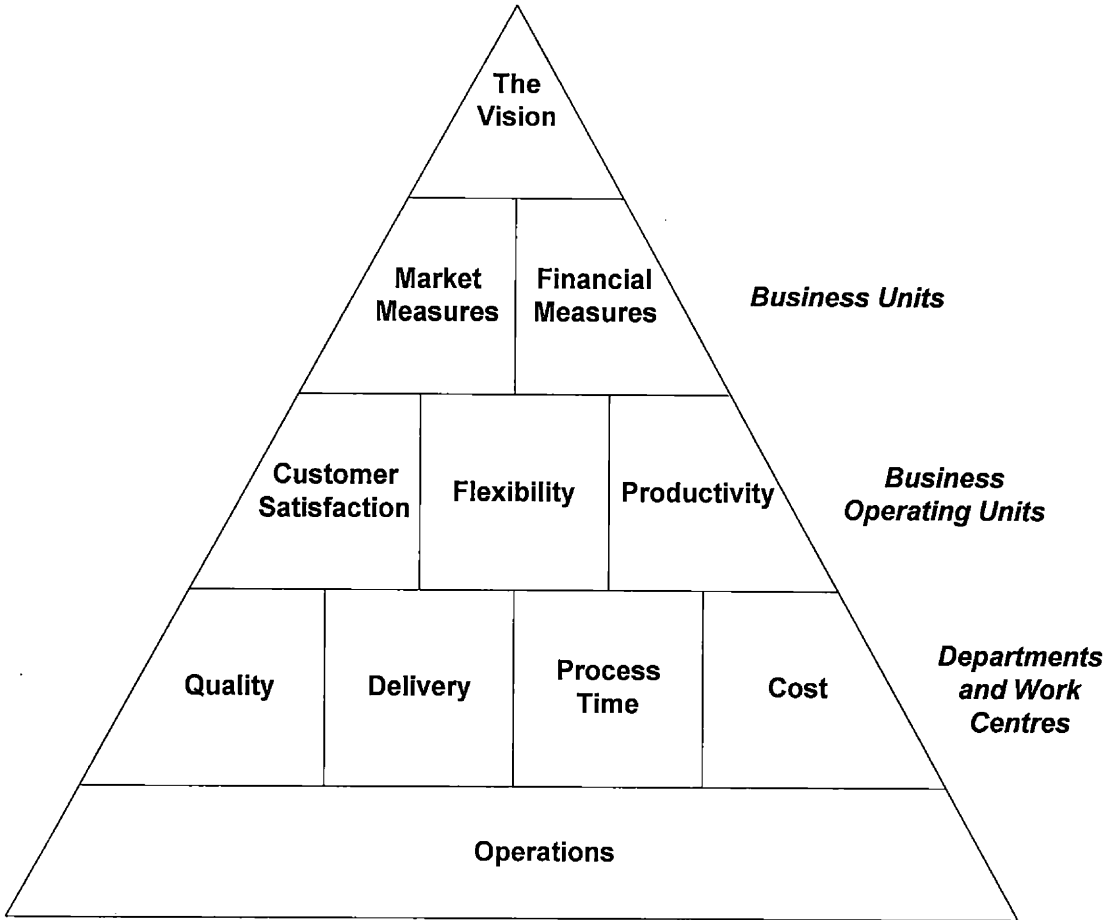


From Figure 1.1, it can clearly be seen that out of the 4 perspectives covered by the Balanced Scorecard, 3 were based on the non-financial performance measures – *customer, internal business, and innovation and learning perspectives*. For each of the above 4 perspectives, executive managers set different goals, and similarly, identify specific measures in order to assess the achievement of each goal.

This mix of financial and non-financial measures can also be seen in the Performance Pyramid introduced by Cross & Lynch (1988-9). This is a four-level pyramid of control objectives and measures of organisational performance; see Figure 1.2. According to Ghalayini & Noble (1996), at the top of the pyramid is the corporate vision. At this level, management assigns a role to each business unit and allocates resources. At the second level, objectives for each business unit are defined in market and financial terms. At the third level, more tangible operating objectives are defined for each business unit in terms of customer satisfaction, flexibility and productivity. At the fourth level, departments in each business unit are represented by specific operational criteria: quality, delivery, process time and cost. As the foundation of the performance pyramid, these operational measures in departments and work centres are then the keys to successful management control.



**Figure 1.2: Performance Pyramid - adapted from Cross & Lynch (1988-9)**



Although the concept of the Balanced Scorecard and the Performance Pyramid were considered to be a major step towards the development of alternative non-financial and integrated PM systems, most of the measures developed in this area were related to manufacturing organisations; *Cross & Lynch (1988-9)*. That is, there have been very few instances of management control and PM research, which were specifically designed for service organisations; *Kullven & Mattsson (1994)*.

Given that the PM systems originated from manufacturing organisations, it is no wonder that studies have found that they fail to accurately portray the performance of service organisations; *Fitzgerald et al (1991)*, *Gummesson (1994)*, and *Storbacka & Johanson (1996)*. Clearly, there is a need to further develop PM systems, which can measure the service performance of organisations, business units, departments, and work centres.

### ***1.3 Measuring the Performance of Service Organisations***

Management accounting research in service organisations is only in its infancy; *Modell (1996)*. Service organisations can be distinguished from other organisations by the uniqueness of their commodity - *the service*. For example, unlike the products from manufacturing organisations, service has the following characteristics - intangibility, heterogeneity, simultaneity and perishability; *Fitzgerald et al. (1991)*, and *Gummesson (1994)*. These characteristics have been identified as the possible reasons behind problems experienced by service organisations in measuring organisational performance. Furthermore, these problems also were found to apply to all service operations and departments, regardless of whether they are in manufacturing or service organisations.

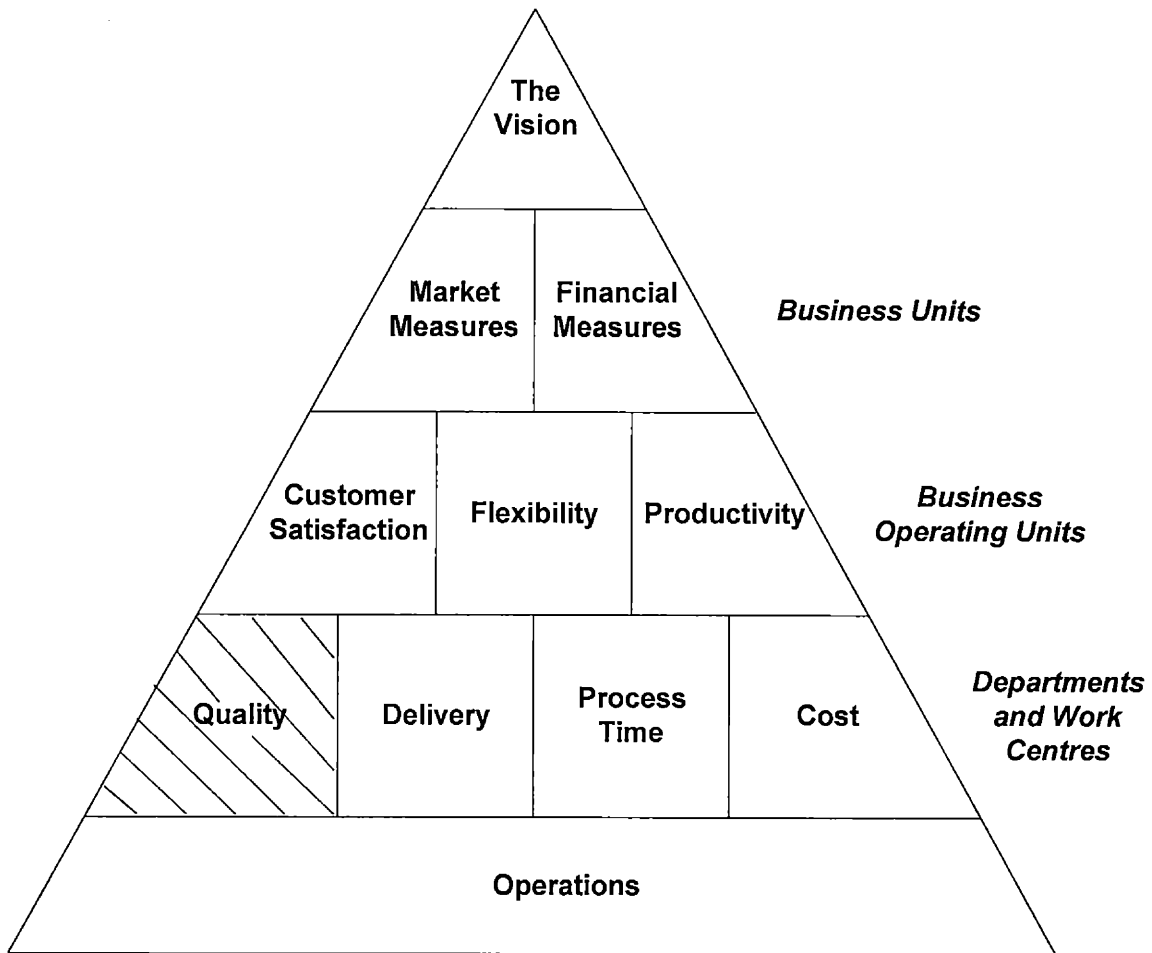
Service providers compete on non-price factors such as quality, which includes reliability, timeliness, responsiveness, innovation, and flexibility. This has led to the concepts of 'customer satisfaction' and 'service quality', and the measurement of performance from 'outsiders' or 'customers' point of view; *Gummesson (1994)*, *Fornell (1995)* and *Downie & Pastoria (1997)*. In terms

of the Performance Pyramid, (external) customer satisfaction\* is at the third level, business operations units, while quality is at the fourth level, departments and work centres. It must be noted that there are two aspects of quality at the departments level – the quality of tangible products, and the quality of intangible services the departments provide. The current study considers the latter aspect of quality criteria of departments and work centres at the fourth level of the Performance Pyramid.

Although there has been a wide range of studies on the concept of service quality and management, almost all of these studies were based on external service performance. Most service quality research to date has focused on the perceptions of external customers in traditional consumer settings. Little research has been published about the applications of service quality measures in departments within the organisation – that is, in internal services; *Young & Varble (1997)*. This area of research is represented by the quality criteria of departments operations in the fourth level of Performance Pyramid; *see shaded area in Figure 1.3.*

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\* For the purpose of this study, the concept of 'customer satisfaction' is considered only from the internal customers' perspective, and used as analogous to internal service quality. That is, the literature concerning the distinction between (external) customer satisfaction and service quality is ignored.

**Figure 1.3: Performance Pyramid – Quality Criteria**

The concept of internal service management in service organisations has been introduced only recently; *Gummesson (1987)*, *Albrechet (1990)*, and *Berry & Parasuraman (1991)*. This new stream of service quality studies has found that maintaining the satisfaction of internal customers is as important, if not more, as meeting the expectations of external customers. That is, the overall corporate performance of organisations are now increasingly dependent upon the quality levels of internal services, and how they are perceived by internal customers; *Vandermerwe & Gilbert (1991)*.



Indeed, organisations, both manufacturing and service, now have new internal functions such as consumer affairs, public affairs, corporate planning, DEP or information services, telecommunications, real estate development, meeting planning and so forth that were unheard of 20 or 30 years ago; *Davis (1992)*.

Despite the growing importance of internal functions, what has been lacking is research on the concept of management control and PM systems of internal service provision. That is, given the increasing importance of internal services discussed above, managers must be able to measure and control the performance of various internal service departments. Unfortunately, the small number of existing studies in this category are mostly theoretical studies, which conceptually hypothesised the possible link between the cost and the contribution of internal services towards organisational control and performance. There is an urgent need for more research, not to simply acknowledge the importance of internal services, but also to develop conceptual control models and PM systems for internal service management.

That is, instead of simply acknowledging the applicability of service quality as a non-financial performance measure, the accounting research must focus on the application of service quality as the measurement of performance. So far, there has been little, if any, accounting research based on the measurement of service quality.

## ***1.4 Contribution of the Study***

The current study aims to develop a conceptual model of service quality in an internal services setting by modifying the “gaps model” of service quality, first introduced by Parasuraman, Zeithaml and Berry (PZB)\* in 1985. The “gaps model” of service quality was developed in an external setting, and it explained the concept of how customers’ perception of service quality performance is influenced by 5 distinct ‘gaps’ occurring within an organisation. That is, the service performance of an organisation is defined by its customers as the difference between their expectation and perception of service; see *Chapter 2.3*.

Based on this model of service quality, the current study develops a conceptual model of service quality for internal service provisions. The study contends that there are three levels of internal service - *ideal*, *acceptable*, and *actual*, and as a result, there exists 7 distinct gaps between the suppliers and customers of internal service; see *Chapter 2.5*.

The study also designs a new PM system based on this conceptual model by modifying the SERVQUAL instrument first introduced in PZB (1988). SERVQUAL is a concise multiple-item scale, which contains 22 pairs of Likert-type items under 5 distinct but related service dimensions where each item is recast into two statements. The instrument is intended to measure

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\* Papers by Parasuraman, Zeithaml and Berry will be denoted as **PZB**, and Parasuraman, Berry and Zeithaml as **PBZ**, to negate any confusion over references to their studies.

customers' expectations and perceptions about the particular organisation whose service quality is being assessed; *see Chapter 3.2.*

Using the three levels of internal service discussed above, the current study modifies the original SERVQUAL instrument to the internal services setting; *see Chapter 4.5.* Furthermore, the study examines the construct of the modified SERVQUAL questionnaire and its applicability in internal services; *see Chapter 5.*

Finally, the current study applies the conceptual model of internal service quality and its related PM system, the modified SERVQUAL instrument, to an internal service department - an IT department within a Faculty of Commerce and Economics in one of the largest universities in Australia, to measure its service performance; *Chapter 6, 7, and 8.*

### **1.5 Structure of the Study**

The structure of this thesis is as follows:

- Chapter 2 examines the approaches to internal services and their management. Furthermore, it considers the applicability of service quality as the performance measurement of internal departments and develops a conceptual model of internal service quality;
- Chapter 3 considers the development of SERVQUAL, a PM system of service quality, and reviews the existing empirical studies on SERVQUAL. It also considers the applicability of SERVQUAL in an internal services setting;

- Chapters 4 outlines the research methodology and design adapted in the study;
- Chapters 5, 6, 7, and 8 contain the discussion and analysis of the findings to the study and their implications; and,
- Chapter 9 provides a summary of the findings, a discussion on the limitations present in the study and a consideration of implications for future research.

## **CHAPTER 2**

# **MEASURING THE PERFORMANCE OF SERVICE DEPARTMENTS**

*“You cannot measure what is not defined. You also cannot tell whether you have improved something if you have not measured its performance.” (Paul A. Strassmann, 1985)*

### **2.1 Introduction**

Recently, internal services due to the ever-increasing nature of their expenditures, have become one of the most critical aspects of organisational control; *Chapter 1.1*. Internal services comprise all services provided and received within an organisation. Every internal department in an organisation provides some form of service to other departments and work centres. Unfortunately, due to the unique, intangible nature of service, measuring the service performance of these internal departments has been rather difficult.

In this Chapter, four approaches to the management control of internal service functions and their performance are discussed in detail. The concept of service quality and how it is perceived by “customers” of internal services is then introduced as a potential PM of the internal departments. Furthermore, a conceptual model of internal service quality is developed from the “gaps model” of service quality, first introduced in PZB (1985).



## **2.2 Approaches to Internal Services**

Due to the emergence of integrated PM systems which incorporates both financial and non-financial measures together, a great deal of attention has been devoted to methods for improving the quality of service provided to external customers; *Chapter 1.3*. However, less frequently discussed are the numerous internal customer linkages between divisions and departments within an organisation, and how to satisfy the need of internal customers; *Vandermerwe & Gilbert (1991), and Davis (1993)*.

Indeed, what has been lacking from the management accounting research on the PM systems is the concept of management control and PM systems of internal service provision. Indeed, there are only a handful of studies, which have applied management control and performance measurement to internal service operations. These studies have concluded that given the increasing importance of internal services in today's markets, managers must be able measure and control the performance of various internal service departments.

Vandermerwe & Gilbert (1989) identified 4 distinct approaches to internal service management control and performance measurement; *the accounting approach, the organisational approach, the operational approach, and the market driven approach*. The four approaches are summarised in Table 2.1.

**Table 2.1: Approaches to Internal Service Management and Control - adapted from Vandermerwe & Gilbert (1989)**

Approach	Focus	Relationship - buyer/seller	Kinds of services
Accounting	Minimising internal services cost	<ul style="list-style-type: none"> <li>• Low customer involvement</li> <li>• Financially based</li> </ul>	<ul style="list-style-type: none"> <li>• Undifferentiated</li> <li>• Commodity</li> </ul>
Organisational	Services provided on request	<ul style="list-style-type: none"> <li>• Defined relationship</li> <li>• Task oriented</li> </ul>	<ul style="list-style-type: none"> <li>• Specialist</li> <li>• technical</li> <li>• Differentiated</li> </ul>
Operational	Producing efficient internal services	<ul style="list-style-type: none"> <li>• Limited involvement of customers</li> <li>• Process based</li> </ul>	<ul style="list-style-type: none"> <li>• Standardised</li> <li>• Minimum differentiation</li> </ul>
Market driven	Users (customers) and value of internal services	<ul style="list-style-type: none"> <li>• Ongoing relationship between buyer and seller</li> <li>• Flexible</li> <li>• Market based</li> </ul>	<ul style="list-style-type: none"> <li>• Mass customised</li> <li>• Differentiated when needed</li> </ul>

The accounting approach suggests that the cost of internal services should be minimised, and the best way to do this is to make the users of such services pay for them. That is, the managerial focus is essentially on estimating the overhead costs associated with internal services and how to allocate them to the various divisions. Internal service units exist to serve the company as a whole. Business concepts based on this approach apply to continuous pressure to reduce the cost of internal services. In another word, an internal service is regarded as a 'burden' and they are used as little as possible. This approach is typical of companies operating in commodity and mature markets.

The organisational approach holds that the value of internal services depends upon communications through a specifically designed organisational structure and related systems of management. Here, a receiver of the service must request services from specialists when they have a specific problem. In this

approach, cost is no longer central and the emphasis is on defined relationships and communication between provider and receiver of internal services. That is, to improve the quality of internal service processes, the structural relationship and communication between providers and receivers of internal services must be 'right'. This approach has been shown to work in firms providing specialist and differentiated internal services.

The operational approach is based on the premise that if the company can manage internal service production and delivery, it will maximise efficiency and improve overall results. It stems from the desire to make internal services more efficient. The firm using this approach structures its internal services with the idea of a "service factory" in mind. Industrial production and delivery techniques are used to push costs down and improve productivity. That is, it goes beyond mere cost control; it produces efficient internal services rather than just low-cost services. This approach works better in firms in both classical services and manufacturing, where internal services are routine and standardised.

Despite their fundamental differences, these three traditional approaches have one thing in common - they do not consider the role of internal service users in service delivery. That is, these approaches lack "user sensitivity". The new approach, the market driven approach, takes this concept into consideration.

The market driven approach shifts a focus to users and their actual use of internal services. According to this approach, what users say is important. That is, if the organisation aligns internal services to user needs and their ultimate usage, the overall effectiveness of the corporation will be enhanced. The consequence of such an approach is that organisations must treat providers and receivers of internal services as sellers (suppliers) and buyers (customers) of the market. That is, suppliers want to know about their customers' functions, and their priority is to increase value added to the customer. Not surprisingly, Vandermerwe & Gilbert (1989, 1991) stated that it is the market driven approach, which has the most potential in today's organisations. The market driven approach dictates that:

- All internal services have some impact on an organisation's ultimate ability to deliver quality goods and services to the marketplace;
- If the organisation aligns internal services to the needs of their users, the overall effectiveness of the corporation will be enhanced;
- Organisations must treat internal service buyers or users as **customers**; and,
- Internal services could become the next competitive battlefield.

That is, the market driven approach introduces the concept of an internal market where there is a genuine existence of customers, suppliers and services, and advocates the importance of "listening to the voice of customers" about the quality of internal services being provided and received. The concept of service quality then becomes an essential measurement of

internal service performance. The next section considers the concept of service quality as the measurement of service performance.

### ***2.3 Service Quality Management – the Conceptual Model***

Service quality is an abstract and elusive construct because of the following features unique to service; intangibility, heterogeneity, simultaneity and perishability; *Fitzgerald et al. (1991), and Gummesson (1994)*. Researchers and managers of service organisations concur that service quality involves a comparison of expectations with performance – it is a measure of how well the service level delivered matches customer expectations; *PZB (1985)*.

While the substance and determinants of service quality may be undefined, its importance to organisations and their customers is unequivocal. *PBZ (1991a)* proposed several rationales behind recognising service quality as the measure of organisational performance. Firstly, there has been a general theory in marketing research that high quality goods and services are favoured in the marketplace. That is, high service quality produces measurable benefits in profit, cost savings and market share for organisations. Secondly, this theory is supported by the empirical research of *PIMS (Profit Impact of Marketing Strategies)* which has shown the positive relationship between service quality and organisational performance.

As of the early 1980s, despite the growing importance of service quality, little academic research was focused on conceptualising the construction of service quality and identifying its determinants. That is, most of the articles in

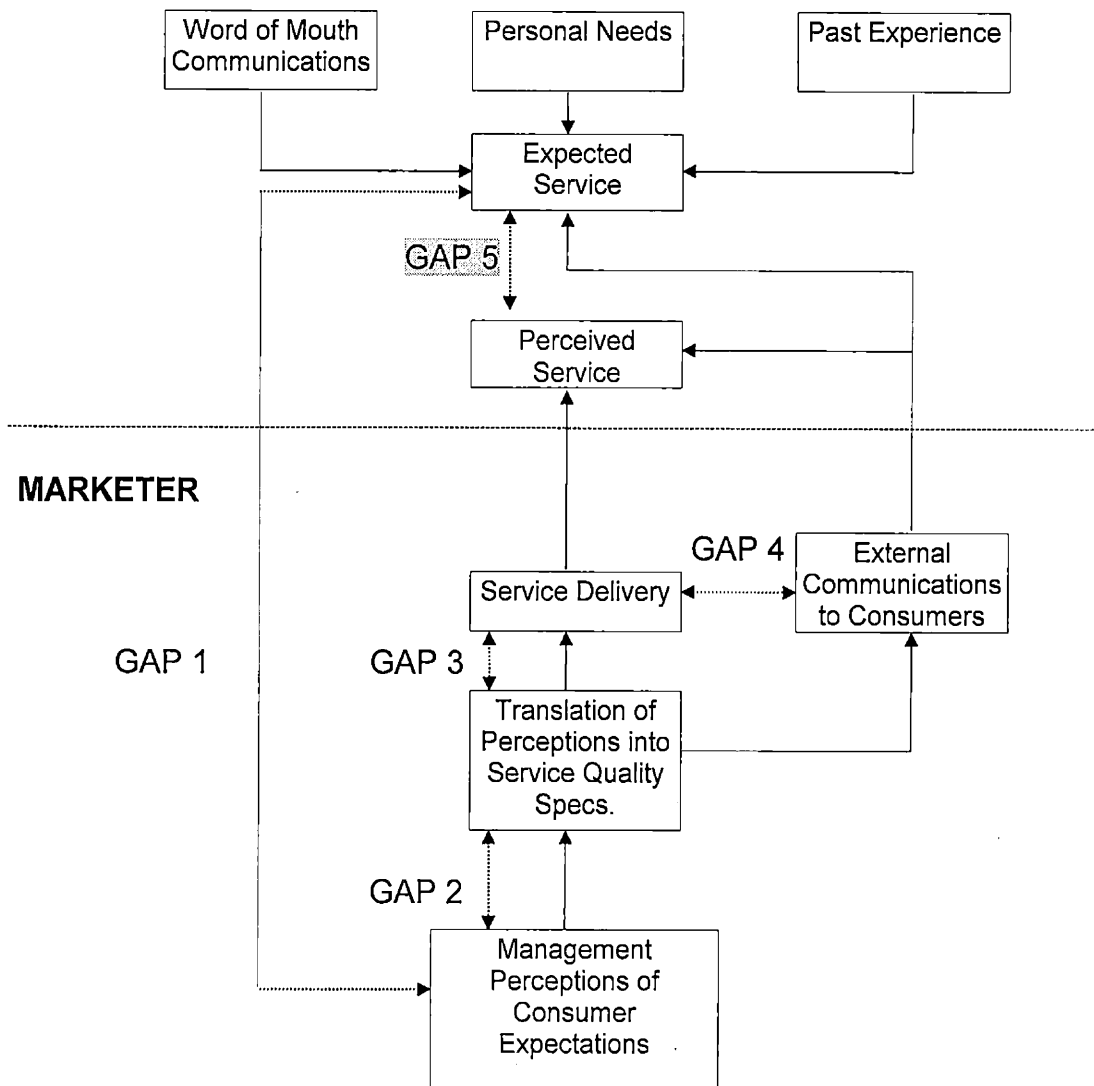
the 1980s concentrated on the general nature of service quality and its components; *PZB (1994)*. While the importance of quality was becoming more widely recognised, its conceptualisation and measurement have typically remained understudied. To try to fill this research void, Parasuraman, Zeithaml, and Berry began a systematic and multi-phased research programme, focusing on the concept and measurement of service quality in the mid 1980s.

As a result, PZB (1985) introduced their well-known conceptual model of service quality, which indicates that the customers' perception of service quality performance are influenced by five distinct '*gaps*' occurring in organisations; see *Figure 2.1*.

From the 4 sets of executive interviews, PZB (1985) found that within an organisation (the MARKETER side of the model), a set of discrepancies or gaps exist regarding executive perceptions of service quality and the tasks associated with service delivery to consumers. These gaps can be major hurdles in attempting to deliver a service which consumers would perceive as being of high quality.

**Figure 2.1: The Conceptual Model of Service Quality – the Gaps Model (PZB 1985)**

### CONSUMER



PZB (1985) defined these five gaps as:

- Gap 1 - Difference between customer expectations and the management's perception of customer expectations;
- Gap 2 - Difference between the management's perception of customer expectations and service quality specifications;
- Gap 3 - Difference between service quality specifications and the level of service actually being delivered;

- Gap 4 - Difference between the actual service delivery and what is communicated about the service to customers; and,
- Gap 5 - Difference between customers' perceptions and expectations of service.

Furthermore, the model proposed that service performance of an organisation is defined by its customers as the difference between their expectations and perceptions of service. This difference, depicted by Gap 5, was hypothesised to be influenced by organisational gaps 1 to 4. That is, service quality as perceived by a consumer depends on the size and direction of gap 5 which in turn depends on the nature of the gaps associated with the design, marketing, and delivery of services (gaps 1 to 4).

While a reasonable amount of empirical research has been conducted into the measurement of gap 5, there have been very few contributions related to those organisational factors which actually determine the quality of service delivered to customers – gaps 1 to 4. Indeed, there are remarkably few studies, which actually have considered what makes up the gap 5. One such study was Boshoff & Tait (1996). The study considered factors, which may influence and determine the size of gaps 1 to 3, and found that some factors, which were previously considered as the determinants of service quality, did not in fact influence the level of service quality. It must be pointed out, however, that gaps 1 to 3 themselves were not measured separately. Indeed, no empirical study has yet to individually measure each of the gaps 1 to 4 in order to see whether they provide further understanding of the level of service



quality. This is the result of the problems associated with getting 'inside' data about the marketer's side of the model, within the organisation. There is little doubt that considerable research is still required to identify the factors, which determine the level of service quality.

The legitimacy and the applicability of the "gaps model" have not been questioned. Rather, it has been the measurement of gap 5, which has attracted most attention from researchers and managers alike. The review of the existing empirical studies relating to the measurement of gap 5 is carried out in Chapter 3.

The model developed by PZB in 1985 was based on the external customers setting where there is a clear distinction between CONSUMER, the customers of service external to the MARKETER. The next section considers the application of service quality in the internal service settings.

## **2.4 Internal Service Quality**

Internal service management is concerned with the relationship between the employees who act alternatively as customers and suppliers within the organisation; *Chapter 1.1*. The concern for this particular relationship is due to the logic that the needs of internal customers must be fulfilled before the needs of external customers can be met; *Gremler et al. (1994) and Buttle (1996)*.

Thus, it is frequently stressed that managers should not be concerned just with the interface between customers and suppliers, but instead should encompass all relationships within the organisation through the creation of internal service management programmes; *Chaston (1994)*. Indeed, the idea behind these programmes is that any user of internal services must be treated as if he or she is an external customer. This means that suppliers of internal services must ensure that the quality of their services meets the satisfaction of their customers. Generally, external customers seek quality, value and convenience in their transaction with suppliers, and it should be no different with internal customers; *Buttle (1996)*.

Furthermore, Davis (1991,1993) theorised that many service and support functions fail their most obvious customers – other departments. These studies hypothesised that improving the efficiency of internal customer support can yield long term cost savings and enhance overall service quality of the organisation, and thus, there is an urgent need to manage and measure the performance of internal service functions. Gummesson (1994) also supported these ideas.

Reynoso & Moores (1995) and Reynoso (1998) reviewed existing internal service literature and concluded that, as a consequence of the marketing background of most researchers working in the area, a substantial body of the research has been focused on the outcome of the service from the customer's perspective. According to these studies, internal service management is proposed as a management approach which enables and

motivates all members of the different parts of the organisation, which should be market-driven but not necessarily always marketing-driven. Essentially then, it is concerned with engendering market-oriented management in which marketing is not a function but rather a way of doing business; *Varey (1995)*.

The importance of understanding the needs and expectations of customers has been recognised by researchers of marketing and management, especially by those dealing with the concept of service quality. Given the above definition of internal marketing, the needs and requirements of internal service customers must then be considered.

Despite the existence of numerous studies on the external customers' quality expectations of service they receive, not many studies have considered the requirements and the expectations of internal customers. Recently, however, there have been a growing number of studies based on the expectations of internal customers on the level of service they receive; *Vandermerwe & Gilbert (1991)*, *Reynoso & Moores (1995)*, and *Young & Varble (1997)*. These studies argue that acknowledging the existence of internal customers is not of itself sufficient. That is, in order to understand the value of internal services, it is necessary to determine internal customers' needs and expectations.

One of the most respected studies on the needs of internal customers is *Vandermerwe & Gilbert (1991)*. The study identified what internal service

customers say they need from internal services they receive. These are summarised in Table 2.2.

**Table 2.2: Internal Service Customers' Needs**

CUSTOMER NEEDS	DESCRIPTION
Responsiveness	Service providers' willingness to serve and be flexible
Relevance	The service provided is both generally useful and also easy to use
Reliability	The service is provided with a consistent level of quality; it meets specifications
Within budget	Cost of the service does not exceed its expected price
Cost	The cost of the service is appropriate
On time	The service is delivered when promised

Another comprehensive study, which considered what internal customers expect from the services they receive within the organisation, is Reynoso & Moores (1995). According to the study, the performance of internal service providers has not reflected the growing importance of internal services in the company's competitive arsenal. That is, internal customers believe that their service providers lack sensitivity to their needs and what they believe is the acceptable level of service quality.

Reynoso & Moores (1995) was also one of the earliest studies which considered service quality dimensions of internal customers. The study acknowledged that not unlike external customers, internal customers require specific service quality dimensions from their suppliers. Table 2.3 lists some of the expected quality dimensions of internal services.

***Table 2.3: Internal Service Quality Dimensions***

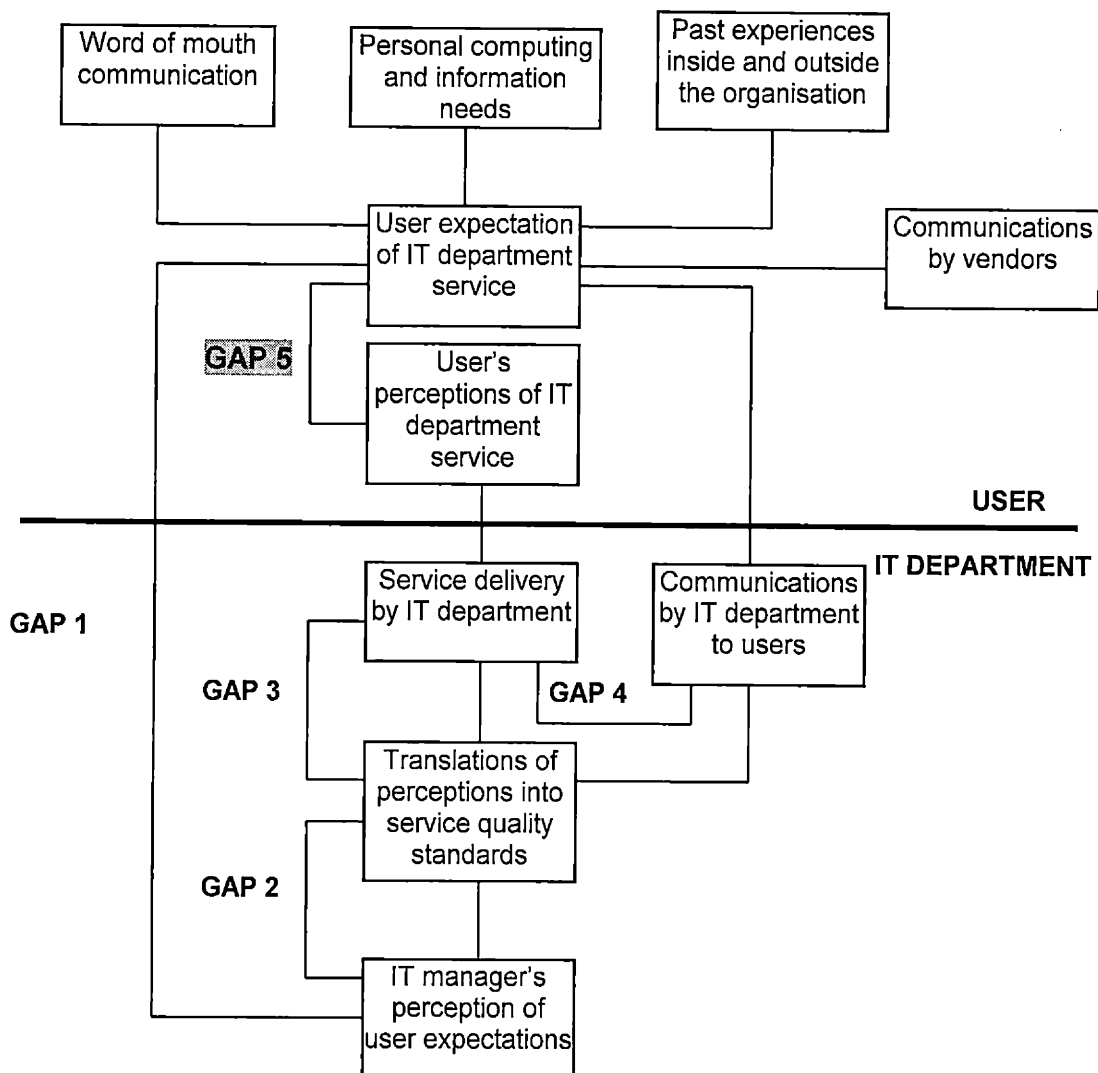
DIMENSION	DESCRIPTION
Helpfulness	The willingness of the supplier unit to help and cooperate with customer units
Promptness	The ability to provide the service promptly responding rapidly to service requests
Communication	To keep the internal customer informed and consulted with regard to progress, problems or changes which may impact upon its activities
Tangibles	The condition and physical appearance of facilities, equipment, materials and written information of the supplier unit
Reliability	The ability of the unit to provide the internal service required correctly, including the provision of accurate information.
Professionalism	The skills, knowledge and experience that members of the supplier unit require to provide the service and to give advice
Confidentiality	The supplier unit's handling of confidential information and delicate situations
Preparedness	The internal organisation and resources required by the supplier unit to be able to provide the service
Consideration	The understanding, recognition, trust and honesty of the supplier unit towards the internal customer

Unfortunately, despite the acknowledgment of the importance of satisfying the needs of internal customers, there also exists a series of 'gaps' or differences between the level of service quality required and expected by internal customers, and the level of service quality actually being provided by internal service suppliers. Using the PZB (1985) conceptual model of service quality, Watson *et al.* (1993) developed a model of internal service quality, identifying 5 gaps between an IT department and its customers; *see figure 2.2*. Watson *et al.* (1993) identified 5 gaps as:

- Gap 1: IT managers do not always understand what users want;
- Gap 2: IT managers might know what users expect, but are unable to set quality standards;
- Gap 3: IT department not keeping its promises;

- Gap 4: the service that is actually delivered might not live up to promises made by the IT department; and,
- Gap 5: IT users' expectation of IT service might be different from their perception of the actual IT service.

**Figure 2.2: The Gaps Model in the IT Department (Watson et al. 1993)**



The study also identified some of the possible factors behind gaps 1 to 4. However, not unlike Boshoff & Tait (1996), while identifying and suggesting possible 'cure' for these gaps, it did not attempt to empirically measure each of the gaps.

Understanding these gaps between the providers (suppliers) of internal service and their users (customers) is essential to determine the level of service quality being provided and reasons for gap 5 occurring. That is, the performance of internal service department can only be managed by acknowledging the existence of the gaps between suppliers and customers of internal service, and by measuring these gaps. Indeed, instead of simply measuring gap 5, which is the function of gaps 1 to 4, each gap should be measured individually for better understanding of just why there is a discrepancy between customers and suppliers regarding their perception and expectation of internal service quality.

### ***2.5 Conceptual Model of Internal Service Quality***

For the purpose of this study, it is proposed that from both the customers and suppliers' perspectives, there exist 3 levels of internal service. Adapting from PZB (1994), the 3 levels of internal service are defined as:

- **Ideal level of service** - the level of service internal customers/suppliers would like to receive/provide to meet the customer requirements;
- **Acceptable level of service** - the minimum/feasible level of service internal customers/suppliers are willing to receive/provide given the constraints of personnel, technology and organisational limitations; and,
- **Actual level of service** - the actual level of service perceived by internal customers/suppliers.

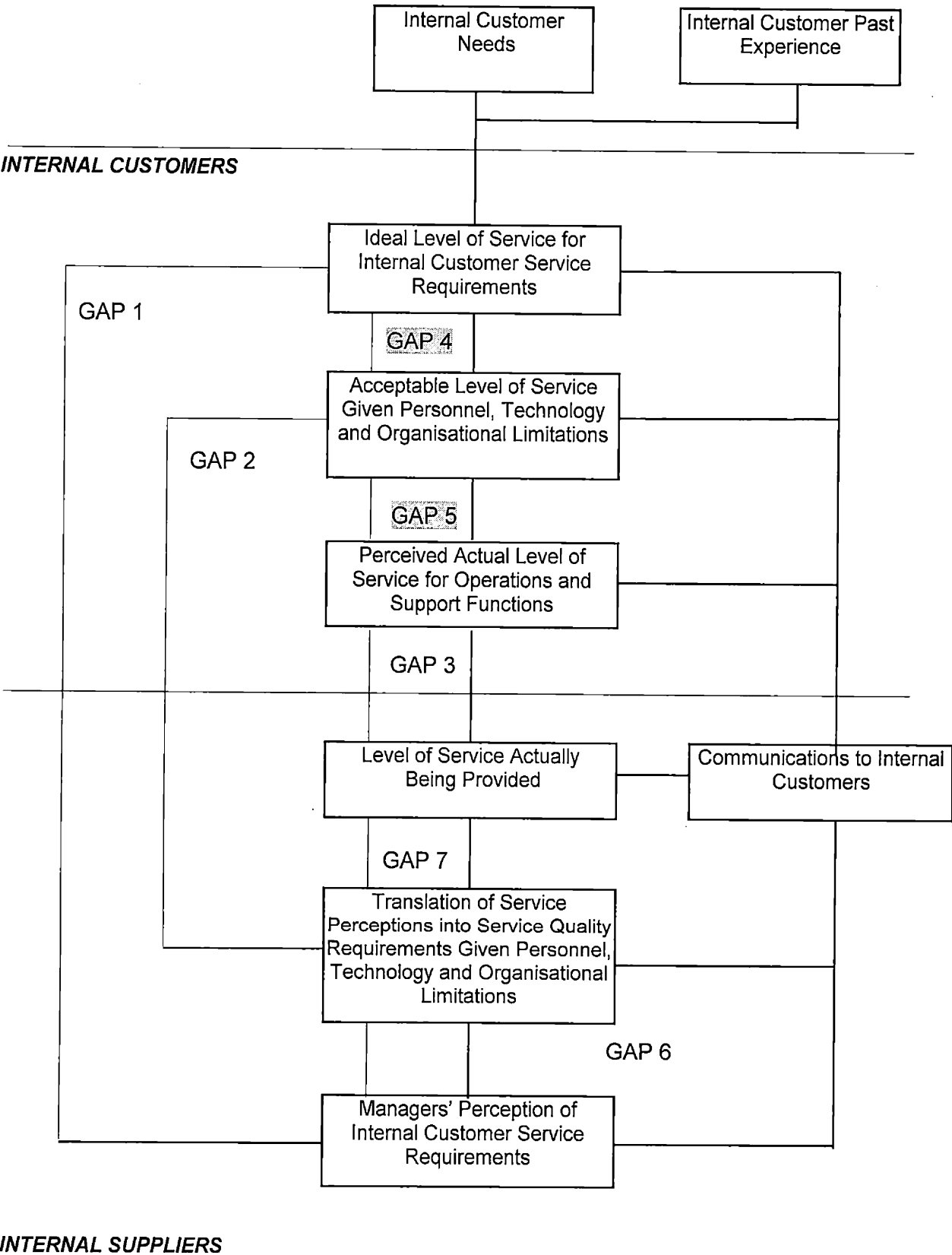
By acknowledging the above 3 levels of internal service, it is proposed that there is a need to understand what may cause the difference between the 3

levels of internal service. The new conceptual model of internal service quality, which was developed from the original PZB (1985) model, incorporates these 3 levels of internal service and possible discrepancies; see *Figure 2.3*.

The major difference between the original “gaps model” and the new internal service model is the acknowledgment that internal customers are aware of limitations imposed on suppliers due to personnel, technology and other organisational factors. That is, within the difference between customers' expectations and perceptions of service quality, depicted as gap 5 in *Figure 2.3*, there is a level of service which **acceptable** to customers. The acceptable level of service is equal to, or less than, but never greater than what is expected by customers.



Figure 2.3: The Conceptual Model of Internal Service Quality



The new conceptual model of internal service quality then identifies 7 gaps between suppliers and customers of service. These are:

- Gap 1: the difference between suppliers and customers' perception of *Ideal Level of Service*;
- Gap 2: the difference between suppliers and customers' perception of *Acceptable Level of Service*;
- Gap 3: the difference between suppliers and customers' perception of *Actual Level of Service*;
- Gap 4: the difference between service level customers would like to receive and what they would accept, given the limitations due to personnel, technology and other organisational factors;
- Gap 5: the difference between service level acceptable to customers and the actual level of service perceived by customers;
- Gap 6: the difference between suppliers' perception of what customers want and the level of service they can provide given the constraints; and,
- Gap 7: the difference between level of service suppliers can provide and the actual level of service being provided.

It is proposed that understanding these 7 gaps is essential to the successful management of internal service functions. According to the model, the quality of internal service from the customers' perspective, depicted by gaps 4 and 5, is determined by the other 5 gaps between customers and suppliers of internal service. That is, measuring these 7 gaps will give managers as well as the users of internal services a better understanding of just what is

involved in the provision of services within an organisation and how to improve its efficiency and effectiveness.

## **2.6 Conclusion**

Internal service management, which includes managing employees who alternatively act as customers and providers of internal services, and measuring the performance of internal services, has become one of the most critical aspects of organisational control.

Unfortunately, the traditional approaches to internal services have not been very successful due to the changes in the perception of internal service functions in organisations. Coupled with the problems associated with traditional management control and PM systems in measuring the performance of service, there clearly is a need to develop new conceptual models and PM systems relating to internal service departments.

In this chapter, a conceptual model of internal service quality was developed based on the original “gaps model” by PZB (1985) and on the IT service quality model by Watson, *et al.* (1993). The new model integrates 3 different levels of internal service - *ideal*, *acceptable* and *actual*, and identifies 7 gaps between customers and suppliers of internal service, which may determine the level of service quality. Based on this conceptual model of internal service, the next Chapter develops an alternative PM system, which can measure the service performance of an internal department, by assessing each of the 7 gaps identified in the model.

## **CHAPTER 3**

# **THE MEASUREMENT OF SERVICE QUALITY**

*"You can't manage what you can't measure." (Stone & Banks, 1997)*

### **3.1 Introduction**

As discussed in Chapter 1.3, service quality recently has become one of the most popular alternative non-financial performance measures in management accounting. Intensifying competition and rapid deregulation have led many organisations to seek alternative ways to differentiate themselves. One such way is by providing superior quality of service.

The concept of service quality originated from the field of marketing, which proposes that there is a need for organisations to understand and measure customers' expectation of service being provided by organisations. That is, organisations must know the level of service quality their customers expect; *PBZ (1994)*. Furthermore, the concept of internal services and the importance of internal customers' expectation of service quality on the organisational performance have also emerged; see *Chapter 2.4*.

Indeed, researchers and managers have never disputed the importance of service quality and its potential as an alternative, non-financial performance

measure. Rather, it has been the difficulties associated with the measurement of such an intangible concept that has generated great research interests, as well as a substantial dilemma.

In this chapter, the development of SERVQUAL, a service quality measurement instrument, introduced in 1988 by Parasuraman, Zeithaml, and Berry (PZB), is examined. Furthermore, the applicability of SERVQUAL as a PM system in internal services setting is also considered.

### **3.2 Early Developments**

SERVQUAL, a PM system designed to measure service quality, was developed by PZB in 1988 based on their conceptual model of service quality, the “gaps model”, discussed in Chapter 2.5. The “gaps model” proposed that service performance of an organisation should be defined by its customers as the difference between their expectations and perceptions of service. SERVQUAL was designed to measure this difference, depicted by gap 5 in the model; see *Figure 2.1*.

The conceptual foundation for the SERVQUAL scale has been derived from the works of various researchers who have examined the meanings of service quality and from a comprehensive qualitative research study, which defined service quality and illuminated the dimensions along which customers perceive and evaluate service quality; *PZB (1988)*.

After much research into the construct of the dimensionality of service, PZB identified that there are 5 major distinct, but correlated dimensions of service.

They are:

- **Tangibility** - appearance of physical facilities, equipment, personnel and communication materials;
- **Reliability** - ability to perform the promised service dependably and accurately;
- **Responsiveness** - willingness to help customers and provide prompt service;
- **Assurance** - knowledge and courtesy of employees and their ability to inspire trust and confidence; and,
- **Empathy** - caring individualised attention the firm provides its customers.

The construct of quality as measured by SERVQUAL along the above 5 service dimensions involves the perceived quality of service. Perceived quality is the customers' judgment about an organisation's overall excellence or superiority. It is a form of attitude, related but not equivalent to satisfaction, and it results from a comparison of customers' expectations with perceptions of service performance. Service quality then can be measured by a comparison of what customers feel organisations should offer, with their perceptions of the actual performance of organisations providing services. Perceived quality is therefore viewed as a degree and direction of discrepancy between customers' perceptions and expectations. Expectations are viewed as desires or wants of customers; that is, what they feel a service provider *should* offer, rather than *would* offer; PZB (1988).

In summary, SERVQUAL is a concise multiple-item scale, which contains 22 pairs of Likert-type items, where each item is recast into two statements. One half of these items are intended to measure customers' expectations about organisations in general within the service categories being investigated, and the other 22 matching items are intended to measure perceptions about the particular organisation whose service quality is being assessed. The items are presented in a 7-point response format with anchors 'strongly agree' and 'strongly disagree'. Service quality is then measured by calculating the "difference scores" between corresponding items; i.e. perceptions minus expectations of service quality.

After the conception of SERVQUAL in 1988, PZB set about retesting and redefining the SERVQUAL scales. PZB (1991a) reaffirmed that customers compare perceptions with expectations when judging a firm's service. Furthermore, PZB (1991b) reconsidered an exhaustive set of constructs potentially affecting the magnitude and direction of the four service gaps. The study also considered relative importance of SERVQUAL dimensions by asking customers to allocate a total of 100 points across the 5 dimensions according to how important they considered each to be, and found that:

- The allocation patterns are virtually identical for the different customer samples, which indicate that the relative importance of the SERVQUAL dimensions is stable across different service settings; and,

- According to the paired-sample t-tests, there was a statistically significant differences between the dimensions – that is, customers did acknowledge and distinguish the 5 dimensions from each other.

Not surprisingly, these series of systematic and multi-phased studies sparked an enormous research interest. Researchers, as well as managers, were hopeful and yet cautious of the possibility of ascertaining an instrument which could measure the level of service quality in quantifiable terms. As a result, the construct validity of the SERVQUAL instrument was questioned by a series of studies. Parasuraman, Zeithaml, and Berry then systematically responded to the issues raised by these studies. Table 3.1 summarises the major studies that have considered the applicability of SERVQUAL as the PM system designed to measure service quality.



**Table 3.1: Studies on Construct Validity of SERVQUAL**

FOR		AGAINST	
Study	Description	Study	Description
PZB (1988)	Development of a 22-item SERVQUAL instrument for assessing customer perception of service quality.	Babakus & Boller (1992)	Criticism of the service dimensions used in SERVQUAL.
PBZ (1991b)	Refinement of SERVQUAL scale by changes to 22-item statements.	Cronin & Taylor (1992)	Reservations about the service dimensionality as well as difference scores.
PBZ (1993)	Response to Brown <i>et al.</i> (1993). Reiteration of the superiority of difference-scores.	Brown <i>et al.</i> (1993)	Problems with the conceptualisation of service quality in SERVQUAL.
PBZ (1994)	Introduction of 3 alternative formats of SERVQUAL	Cronin & Taylor (1994)	Introduction of SERVPERF, measuring service quality using customers perception only.
PZB (1994)	Response to Cronin & Taylor (1992) and Teas (1993). Again, advantages of difference-scores outweigh any possible construct flaws.	Van Dyke <i>et al.</i> (1997)	Problems associated with the use of difference scores in IT service quality. Some alteration must be made before using SERVQUAL in IT settings.
Kettinger & Lee (1997)	Advocating the use of SERVQUAL as a measure of IT service quality.		
Pitt <i>et al.</i> (1997)	Problems outlined in Van Dyke <i>et al.</i> (1997) regarding difference scores are not as critical as the paper suggests. The dimensions of service quality in SERVQUAL seem to be as applicable to the IT department as to any other organisational setting.		

### 3.2.1 *The Criticisms*

One of the earliest studies critical of the construct validity of SERVQUAL was Babakus & Boller (1992). The study contended that there are problems concerning the definition of the construct as well as the psychometric properties of SERVQUAL scale. It was critical of the number of service dimensions used in SERVQUAL, asserting that it was unclear whether SERVQUAL is measuring a number of distinct constructs of service or a global, more abstract service variable. It also criticised the concept of difference scores, which involves the difference between customers' perception and expectation of service. According to the paper, when people are asked to indicate a desired and existing level of quality, a number of psychological constraints may be activated to make the resulting deficiency scores problematic. Cronin & Taylor (1992) also supported these criticisms.

Indeed, one of the most consistent and strongest criticisms regarding the construct validity of SERVQUAL involves the psychometric concerns regarding the concept of difference scores used by the SERVQUAL instrument. Difference scores involve the subtraction of scores on one measurement from another measurement to create a new variable, which is then used in the subsequent data analysis. In SERVQUAL, a difference score is defined as the difference between customers' expectation and perception of service. As a result, the average of the difference scores making up a service dimension discussed in Section 3.2 serves as the measure of that facet, while the average score across all items serves as the overall measurement of service quality.

Brown *et al.* (1993) also strongly contended that there are several problems with reliability, discriminant validity and variance restrictions due to the use of difference scores. They posited that the non-difference scores measure, which measures perception of customers only, is better. Cronin & Taylor (1994) was another study which concluded that there is no evidence to support the inclusion of customer expectations in measures of service quality. They also preferred the perception only scale to measure service quality. However, it must also be noted that none of the above studies concluded that customer expectations are not valuable to managers, nor did they dismiss SERVQUAL outright as the measuring instrument of service quality.

### *3.2.2 Responses from Parasuraman, Zeithaml, and Berry*

PBZ (1993) and PZB (1994) responded to the above criticisms by enforcing that SERVQUAL items represent core evaluation criteria that transcend specific companies and industries. They argued point-by-point why difference scores are preferable to perceptions only scores. They argued that:

- Existing service quality studies show that there are huge differences between the two scores. That is, considering perception only scores can undermine the real level of service quality in organisations;
- Separate measures of perception and expectation allow managers to better understand the dynamics of customers' assessments of service quality over time; and,

- Gathered data on customers' perception and expectation of service quality can serve equally well the dual objectives of accurately diagnosing service shortfalls, and explaining the variance to related variables.

More recently, researchers in the area of Information Systems (IS) research have considered the applicability of SERVQUAL as the measure of IT service quality. Kettinger & Lee (1997) strongly advocated the use of SERVQUAL by suggesting that the conceptual and the construct validity of SERVQUAL instrument is quite applicable in the IT setting. Although Van Dyke *et al.* (1997) was in accord with other critical papers discussed above in questioning the use of difference scores and the dimensionality of service, again, it must be noted that the study did not dismiss the SERVQUAL instrument outright. Indeed, Pitt *et al.* (1997) found that the problems outlined in Van Dyke *et al.* (1997) in IT settings were not as serious as the paper suggested. That is, the SERVQUAL instrument is as applicable in the IT setting as it is to any other organisational settings.

### **3.3. Recent Developments**

In response to the above ongoing debate about the need for SERVQUAL's expectation component and the psychometric soundness of SERVQUAL's difference-score measures, PBZ (1994) incorporated the 2 expectation levels discussed below into the SERVQUAL instrument, and introduced 3 variations of the SERVQUAL instrument. These changes were, in theory, to negate most of psychometric problems associated with the difference scores measures in the original version of SERVQUAL discussed in Section 3.2.1.

As stated above, the PBZ (1994) study revised and refined the original SERVQUAL, but its basic content, structure and length have remained intact. In it, PBZ developed 3 different SERVQUAL questionnaire formats to address issues and criticisms involving the original version of SERVQUAL. The study also introduced a new concept, which posits that service expectations exist at 2 levels which customers can use as standards in assessing service quality. These levels are:

- ***Desired service*** - level of service customers believe can be and should be provided by service organisations; and
- ***Adequate service*** - the minimum level of service customers are willing to accept.

Although the new version of SERVQUAL's expectation component still reflected the desired service construct, it has been modified not only to capture the discrepancy between Perceived and Desired Service (PDS), but also the discrepancy between Perceived and Adequate Service (PAS). The adequacy of this new component was tested by the 3 alternative questionnaires formats, one incorporating the difference score formulation and the other two incorporating direct measures of service quality. The three alternative SERVQUAL formats are:

- ***One-Column Format*** - This format generates direct ratings of the service superiority and service adequacy gaps – it measures PAS directly. Thus, this format involves repeating the battery of items as in SERVQUAL;

- **Two-Column Format** - this format also generates direct ratings of the service-superiority (PDS) and service adequacy (PAS) gaps with two identical side by side scales; and,
- **Three-Column Format** – in contrast, this format generates separate ratings of desired, adequate and perceived service with three identical side-by-side scales. It requires computing the perceived-desired and the perceived-adequate differences to quantify PDS and PAS. Thus, its operation of service quality is similar to that of the original SERVQUAL, with two measures of difference scores.

Examples of these three formats are shown in Figure 3.1, and the comparison between the three formats is summarised in Table 3.2.

**Figure 3.1: Alternative SERVQUAL Formats adapted from PZB (1994)**

When it comes to Receiving Prompt Service...

- One-Column Format

Lower Than My Desired Service Level			The Same as My Desired Service Level			Higher Than My Desired Service Level		
1	2	3	4	5	6	7	8	9

- Two-Column Format

Compared to My Minimum Service Level, _____'s Service Performance is...								
Lower			Same			Higher		
1	2	3	4	5	6	7	8	9

Compared to My Desired Service Level, _____'s Service Performance is...								
Lower			Same			Higher		
1	2	3	4	5	6	7	8	9

- Three-Column Format

My Minimum Service Level is....								
Low						High		
1	2	3	4	5	6	7	8	9

My Desired Service Level is...								
Low						High		
1	2	3	4	5	6	7	8	9

My Perception of _____'s Service Performance is...								
Low						High		
1	2	3	4	5	6	7	8	9

***Table 3.2: Comparative Summary of alternative SERVQUAL formats – adapted from PBZ (1994)***

Criteria	One-Column Format	Two-Column Format	Three-Column Format
<b>General Scale Characteristics</b>			
<b>Type of measure</b>	Direct measure of PAS	Direct measures of PDS and PAS	Difference Score measures of PDS and PAS; perceptions ratings
<b>Respondent ease</b>	high	medium	high
<b>Respondent confidence</b>	high	medium	high
<b>Reliability and Factor Structure</b>			
<b>Reliability coefficient</b>	high	high	high
<b>Validity</b>			
<b>Predictive and convergent validity</b>	high	high	high
<b>Diagnostic Value</b>			
<b>Ability to determine the position of perceptions in relation to zone of tolerance</b>	no	yes	yes
<b>Ability to pinpoint position of zone of tolerance and perceptions</b>	no	no	yes
<b>Potential for inflated ratings and consequent erroneous inferences</b>	high	high	low

From Table 3.2, it can be seen that theoretically, the three-column-format SERVQUAL is superior than the two-column-format, which in turn is superior to the one-column-format as a managerial diagnostic tool providing detailed and accurate data to determine service deficiencies and to initiate appropriate improvement efforts. That is, while there are no differences between the

three formats in terms of their reliability and validity, and the respondent ease and confidence, the diagnostic value of the three-column format is by far superior. Unfortunately, the theoretical superiority of the three-column format has not yet been empirically tested, let alone proved by the existing SERVQUAL replication studies. Table 3.3 summarises some of the major SERVQUAL replication studies.

From Table 3.3, it can be seen that SERVQUAL replication studies since 1994 still have applied the original, or similar to, format of SERVQUAL. This is despite the above claim put forward by PBZ (1994) on the superiority of the 3-column-format, which was also acknowledged by Kettinger & Lee (1997). However, it is worth noting that while acknowledging the potential superiority of the three-column format, they did not attempt to empirically test this superiority. The reluctance of researchers to adapt the three-column format SERVQUAL is perhaps due to the fact that it takes longer for respondents to complete the three-column format questionnaire than the other two formats. Whatever the reason, as a consequence, this particular format of SERVQUAL instrument must be empirically tested more thoroughly, before its applicability and superiority can be claimed.



**Table 3.3: Comparison of SERVQUAL Replication Studies**

STUDY	SAMPLE	SERVQUAL FORMAT	CRONBACH ALPHA	NUMBER OF DIMENSIONS
PZB (1991b)	Telephone & Insurance companies, Bank	Similar to PZB (1988)	.80 to .93	5 dimensions
Babakus & Boller (1992)	Electric and gas utility company.	Similar to PZB (1988)	.67 to .83	No clear 5 dimensional factor structure
Cronin & Taylor (1992)	Banks, Pest Control, Dry Cleaning, Fast Food	Similar to PZB (1988)	.85 to .90	Single clear service quality dimension
Brown <i>et al.</i> (1993)	Financial institution	Format modified in PZB (1991b)	.94	Undimensional construct, certainly not 5
Kettinger & Lee (1994)	IS services offered by College	Similar to PZB (1991d) with some wording modifications	.875 to .895	4 PZB dimensions (tangibility omitted)
PBZ (1994)	Computer manufacturer, retail chain, auto & life insurer	3 formats: 1-column 2-column 3-column	.87 to .92	5 with possibility of combining 4 of the dimensions to 1
Pitt <i>et al.</i> (1995)	Information services, Financial institution, Consulting firm	Original format PZB (1988)	.62 to .87	Similar to 5 PZB dimensions (no reason why they should not be used)
Kettinger & Lee (1997)	Information services offered in business school	13-item IT adapted SERVQUAL (2-column format)	.818 to .883	4 PZB dimensions without tangibility dimension
Lam & Woo (1997)	Bank, supermarket, retail chains	Original format PZB (1988)	.678 to .945	5 PZB dimensions
Young & Varble (1997)	Purchasing department	Original format PZB (1988) with minor wording modifications	.8856	5 PZB dimensions (dimensionality not tested)

The existing studies also show that there is a seed of doubt as to the dimensionality of service used in the SERVQUAL instrument. While most of the studies found the 5 PZB original dimensions of service (Section 3.2) to be reasonably 'applicable' in various service settings, some studies found the dimensionality to be totally different to that of the PZB (1988); *Babakus & Boller (1992)*, *Cronin & Taylor (1992)*, and *Brown et al. (1993)*. This was also noted in PBZ (1994) which contended that more empirical research must be carried out on the dimensionality of service. In their study, PBZ agreed that while there is nothing intrinsically wrong with the use of their 5 original dimensions of service, 2 of the dimensions, assurance and empathy, can be merged together, and that further testing of the dimensionality is perhaps needed.

Despite the above questions raised by PBZ (1994) regarding the dimensionality of service, SERVQUAL replication studies since 1994 did not examine the dimensionality of service applied in the SERVQUAL instrument. Indeed, from Table 3.3, it can be seen that there was no deliberation of the dimensionality, while acknowledging the need for more research into the dimensionality across various industry settings; *Pitt et al. (1995)*, *Kettinger & Lee (1997)*. Furthermore, some studies did not even consider the dimensionality of service as being problematic; *Young & Varble (1997)*.

Ultimately, it is up to researchers and managers to decide which format of the questionnaires should be used for their research. It will depend primarily on

the purpose of such measures, and unless an alternative way of measuring service quality is introduced, the original concept of SERVQUAL will remain.

Table 3.3 also shows that although various industry settings have been tested by existing studies, including banks, retail chains, manufacturing firms, and financial institutions, it is clear that most of the studies were based on external services. There is only a handful of studies that have used internal service settings; *Kettinger & Lee (1994)*, *Pitt et al. (1995)*, *Kettinger & Lee (1997)* and *Young & Varble (1997)*. Furthermore, none of these studies considered the implications of using SERVQUAL to measure the performance of internal service functions, except for Young & Varble (1997). The following section considers possible implications of the internal service setting on the SERVQUAL instrument.

### **3.4 SERVQUAL in Internal Services**

The SERVQUAL instrument assesses customers' perceptions of service quality by measuring the gap between customer expectations and the perceived service provided across five service quality dimensions; *reliability, responsiveness, assurance, empathy, and tangibility*; see Section 3.2. Although the survey instrument has been administered in a variety of service contexts, such as in banks, dry cleaners, fast food restaurants, hotels, hospitals, and utilities (see Table 3.3), one area of service that has received little attention is internal services; see Chapter 2.2.

Most service quality research to date has focused on the perceptions of **external customers** in traditional customer settings. Little research has been published about the applications of service quality measures in business-to-business or within the organisation; *Young & Varble (1997)*.

The proponents of SERVQUAL have supported the use of SERVQUAL in internal settings by stating the similarities between 'external' and 'internal' customers, and between 'external' and 'internal' service settings. Given these similarities, the use of SERVQUAL to ascertain the quality of external services, as well as internal services seemed quite logical; *Zeithaml et al. (1990)*. Indeed, the similarities seemed quite profound and unchallengeable. Just as in the external customers' viewpoint, there exists a gap between the needs of employees (internal customers) and the performance provided by other departments (service providers); see *Chapter 2.4*.

Also, the survey in the early 1990s found that the needs of internal service customers include responsiveness, relevance, reliability, within budget, cost, and on time, most of which concur with that of the external customers' needs. Furthermore, one of the rare empirical studies specifically on the internal services, concluded that the internal customers in the study did not appear to be alienated by the SERVQUAL approach to service quality measurement. Response rate was high and no visible or vocal expression of discontent with the survey format was observed; *Young & Varble (1997)*.

In Young & Varble (1997), the authors acknowledged that although SERVQUAL was traditionally developed for the use to assess retail customer perceptions of service quality, initial results indicate that SERVQUAL does provide specific internal service departments with a useful method for obtaining feedback from its internal customers. Customers form impressions of service quality whenever they come in contact with service provider, be it external or internal. Internal customers are similar to external customers in that the same general events and behaviours of service providers are associated with satisfaction or dissatisfaction in both types of service encounters.

Furthermore, Kettinger & Lee (1994) adapted the SERVQUAL instrument to provide more specific information about how users of IT department perceive the level of IT services being provided. The study concluded that SERVQUAL can provide additional focus in measuring the functional dimensions of IT service. It also advocated the use difference scores. Although this particular mechanism has come under a lot of criticisms (see Section 3.2.1), the study argued that difference scores provide a superior indicator of customer satisfaction through its mechanism for gauging the magnitude of difference between a user's expectations and perceptions. This was also supported by Pitt *et al.* (1995), which proposed another advantage of using SERVQUAL in IT settings. Because SERVQUAL is a general measure of service quality, it is well suited to benchmarking. That is, IT managers can potentially use SERVQUAL to benchmark their performance against other departments and organisations in the same industry.

Pitt *et al.* (1997) reaffirmed their 1995 study, which proposed that the dimensions of service quality seem to be as applicable to the IS setting as any other organisational setting. Pitt *et al.* found that the problem of reliability of difference score calculations in SERVQUAL is not nearly as serious as Van Dyke *et al.* (1997) had suggested; see *Section 3.2.2*. They also agreed that while perceptions only measurement of service quality have marginally better predictive and convergent validity, this comes at considerable expense to managerial diagnostics. Indeed, marginal empirical benefits of a perception only based service quality measure do not seem to justify the loss of managerial diagnostic capabilities found in difference score measures. For example, the general statement commonly used by IT managers, 'customers expect too much', cannot be justified if expectations were not to be measured.

#### *3.4.1 Problems with SERVQUAL in Internal Settings*

Despite the above logic behind the practicability of SERVQUAL in internal service research, the use of SERVQUAL in internal services is not without its share of criticisms. Although some researchers see the measurement of the quality of internal services as being conceptually no more complex than adopting or adapting the existing findings from external service research using SERVQUAL, there has been several reservations concerning Zeithaml *et al.* (1990)'s observation of the possible straightforward transferability of the SERVQUAL dimensions from the external to the internal customers. One of the most notable reservations about the applicability of SERVQUAL in internal services setting came from Reynoso & Moores (1995).

In their exploratory study, Reynoso and Moores searched for the measurement of internal service quality by carrying out extensive qualitative interviews with employees, pointing out their expectations from other departments. They concluded that, although there seems to be noticeable similarities between the expectations of external and internal customers, there also exist several conceptual differences. They especially were concerned with the direct applicability of the 5 service dimensions, identified by PZB, in internal services. That is, given the existence of conceptual differences between external and internal customers, it is not unreasonable to conclude that the internal customers' dimensionality of service may be different from that of the external customers. This is especially true in lieu of the discussions on the dimensionality of service in Section 3.3.

Furthermore, the service items under each dimension must also be considered in more detail in order to see whether customers, in determining the quality of service, consider each service item of equal value. In its present form, the SERVQUAL instrument does not account for the possibility that the service items are not considered of equal importance by customers.

That is, more research is needed in the area of the dimensionality, and individual questions of SERVQUAL before such a sweeping generalisation regarding SERVQUAL can be justified regarding internal service settings.

### **3.5 Selection of the three-column format SERVQUAL**

For the purpose of this study, the three-column format SERVQUAL is selected to measure the gaps identified in the conceptual model of service quality in Figure 2.2. The reasons for selecting the three-column format are:

- None of the existing studies since the conception of different formats of SERVQUAL have applied and tested the validity of the three-column format empirically;
- The current study aims to measure all 7 gaps identified in the conceptual model (see Figure 2.2), and only the three-column format SERVQUAL is capable of measuring all 7 gaps between customers and suppliers of service;
- The three-column format allows the measurement of two scores – difference-scores (gap scores) and actual scores. That is, the current study aims to carry out the comparison between the two scores regarding their reliability and validity; and,
- According to Kettinger & Lee (1997), the three-column format SERVQUAL instrument has the most potential as the PM system in the IT service setting, the internal service setting selected for the current study. The selection of the IT service setting is considered in Chapter 4.

Furthermore, the current study aims to examine the dimensionality of the SERVQUAL instrument, which has been under scrutiny recently (Section 3.3), and whether the original service dimensions apply in the internal service setting. Also, instead of simply considering the relative importance of each dimension as per PBZ (1991b), the study aims to examine the relative



importance of each SERVQUAL item as perceived by customers and suppliers of service, given the possible problems associated with the dimensionality of service in internal service settings.

### **3.5 Conclusion**

Although service and its providers have been around since the beginning of humankind, the study of services and their corresponding marketing and management issues is relatively new. In general, it has been only in the past 20 years or so that researchers and practitioners have been actively exploring and discussing services and the measurement of service quality; *Swartz et al. (1992)*.

The concept of using service quality to measure the level of internal services is due to the acknowledgment that equally as important as the right business unit structure is an appropriate performance reporting system, and the fact that most businesses collect little objective information that can be used to evaluate service unit performance; *Davis (1993)*. Indeed, the problem lies with the financial accounting system that is not very useful for managerial decision making and internal control, giving service quality an edge over existing measures.

SERVQUAL is one instrument that has gained a lot of support in recent years as the PM of service quality. It is a concise multiple-item scale, which contains 22 pairs of Likert-type items where each item is recast into two statements. Unfortunately, the applicability of SERVQUAL instrument in

internal service settings is at best questionable, given that it was predominately developed in external service settings.

The current study aims to examine the following aspects of service quality and the SERVQUAL instrument. The study considers:

- Whether the concept of service quality and the SERVQUAL instrument can be applied in an internal services setting;
- The three-column format SERVQUAL questionnaire in order to test its construct validity and the applicability, and to determine whether it is a superior diagnostic tool as suggested by PBZ (1994);
- Difference-score measures and actual score measures in order to examine whether there is a difference between the two scores;
- The dimensionality of service introduced by PZB (1988), and whether the 5 original dimensions of service applies in the IT services setting selected for the current study; and,
- Given the possibility of the dimensionality problems, the relative importance of each SERVQUAL question, as well as its implications on the measurement of service quality.

## **CHAPTER 4**

### **RESEARCH METHODOLOGY**

*"There are no dumb questions – only dumb answers", (Marshall Loeb)*

#### **4.1 Introduction**

This chapter outlines the research design used in the current study. The research design consisted of a survey questionnaire and a series of short interviews with staff members who are 'customers' and 'suppliers' of Information Technology (IT) services in the Faculty of Commerce and Economics at one of the leading universities in Australia. The survey questionnaire, modified from the SERVQUAL instrument, was distributed to the customers and suppliers of IT services, and a series of short, informal interviews were carried out with 35 of the participants in the study.

The following section looks at some of the reasons behind choosing an IT department as the internal services setting. Section 4.3 defines customers and suppliers of IT service department selected for the study. Section 4.4 details the sample selection and the reasoning behind using these particular subjects. Section 4.5 discusses modifications to the original SERVQUAL questionnaire introduced in Chapter 3. Section 4.6 looks at the methods used to collect data. Section 4.7 considers the background information of the participants in the study. The final section contains a summary.

## **4.2 Choosing the IT Service Setting**

As discussed in Chapter 1.1, internal services recently have gained a lot of attention. One internal service function that has especially gained a lot of attention is the IT service provision due to the ever-growing nature of its expenditure. For example, in the U.S., IT expenditure has been estimated at 2.2% of all revenue: “a *hefty chunk of most companies’ after-tax profit margins*” (Axson 1996). Not surprisingly, measuring the performance of IT service has become one of the most important aspects of management control.

In the past, an IT department dealt primarily with providing the secondary support to other departments such as sales, finance and (external) customer service departments. However, this concept of secondary support has now been replaced. In today’s organisations, IT is considered to be one of the most important resources of the organisation, which also attracts a substantial amount of expenditure. Subsequently, the IT department is no longer merely integrated into a discernible work flow; instead, it is a free standing department that provides legitimate and important internal services to other divisions or work units; *Watson et al. (1993)*.

With the growing importance of IT departments and services being provided by the departments, measuring the performance of IT departments have become quite critical, given the huge amount of investments and expenditures made in the name of ‘IT service’. Previously, the traditional, mainly financial PM systems have been used to assess the performance of IT

departments. Recently, there has been a lot of dissatisfaction with the traditional performance measures in various organisations across different industries; see *Chapter 1.2*. This was also true in the case of IT departments. Indeed, as McKeen & Smith (1993) pointed out, IT researchers were found to have some serious reservations about the application of traditional measures in the IT setting.

The concept of using service quality to measure the performance of IT departments is due to the acknowledgement that their service performance can be determined by the perception of customers of IT service. That is, the performance of IT departments should be measured from their customers' perspective on the quality of IT services being provided. As discussed in Chapter 3.4, the SERVQUAL instrument has been applied in the IT service setting quite successfully; *Kettinger & Lee (1994)*, *Pitt et al. (1995)*, *Pitt et al. (1997)*.

### ***4.3 IT Service Department – the TSG***

One of the most important and practical reasons for choosing the university setting was due to the researcher's access to its facilities and staff members. Also, since the survey questionnaire to be used was considered somewhat exploratory due to the modifications made, it was also deemed that fellow researchers would have better understanding of the questionnaire.

The selection of the Faculty of Commerce and Economics was mainly due to the existence of an internal IT department within the Faculty. Technology

Support Group (TSG) provides a variety of IT services to all staff members within the Faculty. For the purpose of this study, the components of the conceptual model of IT service quality developed in Figure 2.3 are defined as follows:

- **Suppliers** - any member of the Technology Support Group (TSG), the staff-only IT service department exclusive to the Faculty of Commerce and Economics;
- **Customers** - any staff member of the Faculty of Commerce and Economics including academics, administrative assistants, and research students with access, and who have used TSG services at least once; and,
- **IT Service** - a variety of IT services offered by the TSG personnel, including repairs, network operations and general assistance (see Appendix 1: *Survey Questionnaire – Directions* for a complete list).

A more detailed background statement relating to the participants in the study is in Section 4.7.

#### **4.4 Sample Selection**

The purpose of this study was to develop a conceptual control model of IT service quality (see Figure 2.3), and to measure the performance of an IT department using an adapted SERVQUAL instrument first introduced by PZB (1988). It was proposed that by measuring the 7 gaps identified in Figure 2.3, the performance level of the TSG in the Faculty of Commerce and Economics may be determined. The participants of the study therefore had to consist of customers and suppliers of the IT services provided by the TSG.

Subsequently, an initial meeting was arranged with the TSG manager and a couple of academic staff members with wide knowledge of the SERVQUAL survey questionnaire and IT research. During the meeting, the service dimensions introduced in PZB (1985), as well as their original SERVQUAL questionnaire, were discussed in detail to ensure the relevancy and the legitimacy of the questions for the study; see *Chapter 4.5*. Also, permission was obtained from the manager to survey and conduct informal interviews with the personnel of TSG.

The Faculty of Commerce and Economics consists of 9 schools, a Dean's Unit, and the Faculty office. It has approximately 300 academic and support staff and theoretically, any staff member has access to IT services by the TSG, and therefore is a potential customer. That is, as discussed earlier, the 'customer' would be anyone within the faculty who has access to the TSG and has used IT services at least once. Table 4.1 lists participants, both customers and suppliers, according to their schools and departments.

As it can be seen from Table 4.1, 106 questionnaires were distributed and 98 were returned resulting in a response rate of 92%. Out of the 98 questionnaires returned, 89 were from customers, and 9 were from suppliers of IT service. It must be noted that all members of the TSG participated in this study.

**Table 4.1: Participants of the Study - Sample size and Response Rate**

School	No. of questionnaires distributed	No. of questionnaires received (response rate)	No. used (participants who have used TSG services at least once)
<b>Customers</b>			
Accounting *	21	21 (100%)	9
Banking and Finance *	15	10 (67%)	7
Information Systems	22	21 (95%)	21
Economics *	8	8 (100%)	5
IROB	7	7 (100%)	6
SILAS *	5	4 (80%)	2
Marketing	7	7 (100%)	4
International Business	3	3 (100%)	3
Faculty Office	3	2 (67%)	2
Dean's Unit	6	6 (100%)	6
<b>SUB - TOTAL</b>	<b>97</b>	<b>89 (92%)</b>	<b>65</b>
<b>Suppliers</b>			
TSG	9	9 (100%)	9
<b>TOTAL</b>	<b>106</b>	<b>98 (92%)</b>	<b>74</b>

\* Schools with computer support personnel

The high response rate was mainly due to the participants' willingness to help out a 'fellow researcher', and the persistent data collection method employed for the study; see Section 4.6. The existence of a large number of participants who have never used IT services from the TSG was due to two main reasons:

- The existence of School-based computer support personnel (who are not part of the TSG), who in turn request services from TSG on behalf of other staff members; and,
- Some participants do not use computers and/or networks; one participant did not own a computer.



It must be pointed out that all the computer support personnel based in the Schools were asked to participate in the study as customers of the TSG.

#### *4.4.1 Limitations of Sample Selection*

Given the diversity of the customer base consisting of 9 Schools and the Dean's Unit, it would have been preferable to maintain a similar sample size for all departments. This was impossible due to two reasons. Firstly, the 9 Schools varied greatly in their size. For example, the School of Accounting had more than 50 full-time staff members, whereas the School of Business, Law and Taxation had less than a dozen. Secondly, and more importantly, the survey was conducted during the last few weeks of the session, and many staff were on Christmas holidays. Thus, the availability of staff for participation became the main selection criteria. However, only the School of Business, Law and Taxation, which is one of the smallest Schools in the Faculty, did not participate. The other 8 schools were represented in the study; see *Table 4.1*. This may cause some concerns in terms of statistical significance of the results, especially when comparing data according to the 'schools' variable.

### **4.5 Modification of SERVQUAL**

The research design used in this study was the survey questionnaire developed from the original SERVQUAL introduced in Chapter 3. Unlike the original, the questionnaire used for this study was based on the conceptual model of IT service which consists of 3 different levels of IT service - *ideal*,

*acceptable*, and *actual*. Naturally, some modification had to be carried out on the original 22-item SERVQUAL questionnaire.

One study, which used SERVQUAL in an IT setting, was Kettinger & Lee (1997). In their study, the 22 SERVQUAL questions were condensed into 13 questions, with the tangibility aspect of service dimensions being omitted. The rationale for this was that most IT services are provided at the customers' own settings due to the nature of services being requested. That is, it is rather rare for customers to 'visit' the IT department with problems since they often don't know what the problem is, and rarer still for customers to worry about the 'visual appeals' of the IT department. This rationale also applied to the current study, since the Faculty members rarely visit the offices of TSG, and thus, the tangibility dimension was omitted in the current study.

For the purpose of this study, the 13 questions in a 2-column format SERVQUAL used by Kettinger & Lee (1997) were modified into 16 statement-like questions in a 3-column format for its better diagnostic values; see *Chapter 3.5*. Table 4.2 is the comparison of SERVQUAL questions between Kettinger & Lee (1997) and the modified version for this study.

**Table 4.2: Modifications of SERVQUAL questions**

<b>Kettinger &amp; Lee (1997)</b>		<b>Revised Version</b>
<b>When it comes to.....</b>		
<b>Reliability</b>		
<b>1</b>	When excellent information services promise to do something by a certain time, they will do so.	Receiving requested services within a reasonable timeframe.
<b>2</b>	Excellent information services will perform the services right the first time.	Receiving requested services right the first time.
<b>3</b>		TSG personnel showing a sincere interest in solving your problems.
<b>4</b>		TSG personnel keeping their appointments: e.g. for meetings.
	Excellent information services will provide their services at the time they promise to do so.	
<b>Responsiveness</b>		
<b>5</b>		Being informed about exactly when the request can be completed.
<b>6</b>		Being informed regularly about the status of your requests.
<b>7</b>	Employees in excellent information services will give prompt service to users.	Receiving prompt services without delays.
<b>8</b>	Employees in excellent information services will always be willing to help users.	TSG personnel's willingness to help you.
	Employees in excellent information services will never be too busy to respond to users' requests.	
<b>Assurance</b>		
<b>9</b>	The behaviour of employees in excellent information services will instil confidence in users.	The trustworthiness of TSG personnel.
<b>10</b>	Employees in excellent information services will be consistently courteous with users.	The courtesy of TSG personnel.
<b>11</b>	Employees in excellent information services will have the knowledge to answer users' questions.	The level of expertise of TSG personnel.

**Table 4.2 Continued**

<b>Kettinger &amp; Lee (1997)</b>		<b>Revised Version</b>
<b>When it comes to.....</b>		
<b>Empathy</b>		
<b>12</b>		The availability of services during business hours.
<b>13</b>		The availability of services after business hours (5:00 - 9:00 weekdays).
<b>14</b>	Excellent information services will give users individual attention.	Receiving person-to-person, individual attention from TSG personnel.
<b>15</b>	Excellent information services will have the users' best interests at heart.	TSG personnel having your best interests at heart.
<b>16</b>	The employees of excellent information services will understand the specific needs of their users.	TSG personnel understanding your specific requests.
	Excellent information services will have employees who give users personal attention.	

The modifications outlined in Table 4.2 were mainly from the discussions between the TSG manager and staff members with wide knowledge of IT research in the meeting arranged initially; see *Section 4.4*. Most of the changes were restricted to wordings only – for example, the use of the phrase “reasonable timeframe” instead of “a certain time” in question 1 was due to the fact that the TSG never actually states the exact time of service. During the discussions mentioned above, it was decided that some of the original SERVQUAL questions from PZB (1988) should be adapted for the purpose of this study. As a result, questions 3 to 6, and 12 to 13 in the revised version of SERVQUAL questions were adapted from in PZB (1988).

The 3-column-format SERVQUAL is rather uncommon, and thus, the layout of the questionnaire has not been used or discussed very much in the past; see *Chapter 3.3*. After some consideration and beta testing using half a

dozen academic staff with expert knowledge of IT and survey research design, it was decided that side-by-side question format in a 'landscape' layout was to be adopted. This enabled the listing of 3 different levels of IT services in one row, directing participants to complete the questionnaire by questions, not by service levels. The rationale for this was that in order to measure the gaps between the three IT service levels participants must consider each service level *relative* to the other two. That is, participants should consider each 16 statements individually and rank them as such for 3 different levels of IT services. For the purpose of this study, the 3 levels of IT service introduced in Chapter 2 are defined in Table 4.3 (Part B of the survey questionnaire contained in Appendix).

**Table 4.3: 3 Levels of IT Service**

Level of IT Service	Customers	Suppliers (TSG)
<b>Ideal</b>	Level of service customers would like to receive to meet their requirements	Level of service suppliers perceive that they should be providing to meet customer requirements
<b>Acceptable</b>	Minimum level of service customers are willing to accept given the limitations due to technology, personnel and other organisational factors	Feasible level of service suppliers can provide given the limitations due to technology, personnel and other organisational factors
<b>Actual</b>	Actual level of service perceived by customers	Actual level of service perceived by suppliers

Furthermore, the existing studies have not considered the impact of using SERVQUAL questionnaire on BOTH suppliers and customers of service. This posed an interesting dilemma in terms of the survey instrument. The 16 statements modified to suit the 3-column-format had to be changed to suit two different groups of participants. However, the changes were limited to

wordings only; the nature of the questions remained the same, keeping in line with the conceptual model of internal service introduced in Chapter 2.

In addition, it was decided that the personal characteristics of participants should be surveyed as well to consider whether these characteristics would influence any of the findings (Part A of the survey questionnaire). Furthermore, participants were asked to select the 5 most important items from the 16 statements used as questions and rank them from 1 to 5, 1 being the most important. The 16 service items were listed in a random order to negate a possible bias effect since they were reproduced from the main questionnaire (Part C of the survey questionnaire).

The purpose of part C of the survey was twofold. Firstly, by comparing the top 5 service expectations of customers and suppliers, it was hoped to see whether both parties considered the same service aspects as important. Secondly, this exercise was to determine whether the 16 questions used in the study are as equally relevant to customers and suppliers as they were theorised. That is, do they have the same 'value' to participants? The complete survey questionnaires for both customers and suppliers are in Appendix 1: Survey Questionnaire.

#### *4.5.1 Test-Retest*

In order to validate the consistency of the SERVQUAL questionnaire, 9 questionnaires were distributed to randomly selected members of the Faculty 1 week before the main data collection stage. 5 were chosen from the School

of Information Systems, 4 from the School of Accounting. The 9 pre-test participants were asked again to complete the same survey during the data collection phase. The data collected for test-retest were then tested for correlation using the Kendall's tau-b test\*. It was found that while participants showed some variation concerning the ideal (0.441) and acceptable (0.438) levels of IT service, there was a strong correlation for the actual level (0.718) of IT service between test-retest data. That is, the survey questionnaire used was found to be consistent.

#### **4.6 Data Collection**

The main form of data collection was the survey questionnaire based on the SERVQUAL instrument by PZB (1988) and Kettinger & Lee (1997), discussed above. Initially, an introductory letter was sent to all staff members of the Faculty outlining the research proposal and briefly stating what is involved in the participation; see *Appendix 2*. Due to the timing of the survey, which was at the end of the academic session, it was decided that 'knock on the door' approach would be most appropriate and practical. Also, it was hoped that a short, informal interview could be carried out at the same time.

Simultaneously, individual email messages were sent to staff members of the Faculty who were not available during the initial 'knock on the door' phase of data collection. They were asked for an appointment and/or whether they would prefer to complete the questionnaire on their own and return them back to the researcher. Accordingly, meetings were arranged and questionnaires

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\* Kendall's tau-b values for ideal, acceptable and actual levels of IT service are in brackets.

were dropped off in the participants' mail trays to be returned at their earliest convenience.

For participants who agreed to complete the questionnaire on the spot, the surveys were conducted at each participant's office. Upon the completion of the questionnaire, which took approximately 10 to 15 minutes, some participants were interviewed about the way they answered the 16 questions. Interviews conducted were informal and varied greatly according to how participants ranked the three different levels of IT services. Typically, these on-the-spot interviews took 5 to 10 minutes, and due to the reluctance of some participants about their interviews being taped, interviews were recorded only when the permission was granted. The rest of the interviews were transcribed by hand during the interviews.

As a final step of the research process, total confidentiality and anonymity to each participant were assured. They were also assured that any quotes, which may be used in the study, would not be sourced. Furthermore, they were informed that the data collected will be coded, and only the researcher would have access to the raw data. The summary of data collected through this method is outlined in Table 4.4.



**Table 4.4: Data Collection Method**

School	Total collected (no. used)	Collected on-site (interviewed *)	Returned via mail
<b>Accounting</b>	21 (9)	21 (4)	0
<b>Banking and Finance</b>	10 (7)	5 (2)	5
<b>Information systems</b>	21 (21)	10 (6)	11
<b>Economics</b>	8 (5)	2 (2)	6
<b>IROB</b>	7 (6)	4 (3)	3
<b>SILAS</b>	4 (2)	2 (1)	2
<b>Marketing</b>	7 (4)	4 (1)	3
<b>International Business</b>	3 (3)	3 (2)	0
<b>Faculty Office</b>	2 (2)	0	2
<b>Dean's Unit</b>	6 (6)	5 (3)	1
<b>Sub Total</b>	89 (65)	56 (24)	33
<b>TSG</b>	9 (9)	9 (9)	0
<b>TOTAL</b>	98 (74)	65 (35)	33

\* The number represents participants who were interviewed informally about their answers to the 16 SERVQUAL questions.

As discussed earlier, a total of 98 questionnaires were returned at a response rate of 92%. Table 4.4 shows that 65 out of 98 questionnaires were collected face to face on the spot, with 33 remaining questionnaires were returned through the mail. Also, of the staff who filled in the questionnaires on the spot, 35 also agreed to be interviewed.

Out of the 98 questionnaires returned, 74 of these were from participants who have used TSG services at least once and therefore considered in the study; see also Table 4.1.

#### 4.6.1 Limitations of Data Collection

One of the reasons behind the 'knock-on-the-door, collect-on-the-spot' method used for data collection was to eliminate one of the greatest internal

validity threats of the survey method - the response bias. Indeed, by distributing questionnaires in person and collecting them on the spot, the response rate for the study was high 92%; see *Table 4.1*.

However, during the collection of data, it was observed that although the questionnaire was developed to be self-administered, participants quite often asked for clarifications. These clarifications raised by participants were mostly directed towards the format of the questionnaire. As discussed in Chapter 4.5, participants should complete the questionnaire by the 'row', not by the 'column'. This was not a problem for participants who completed questionnaires during the presence of the researcher. However, in hindsight, it must be pointed out that participants who returned questionnaires via mail may or may not have followed the correct procedure.

## ***4.7 Background Information***

The background information of 74 participants was mainly gathered from **Part A: Profile** sections of the survey questionnaire; see *Appendix 1*. Also, the university handbook was consulted for more general background aspects of the participants.

### ***4.7.1 Suppliers of the IT Service***

For the purpose of this study, a supplier is defined as any member of the Technology Support Group (TSG) in the Faculty of Commerce and Economics; see *Chapter 4.3*. The TSG is relatively a new internal technical services department exclusive to the Schools within the Faculty of Commerce

and Economics. The group is comprised of technically qualified staff members who manage, coordinate and meet the demands within the Faculty for computer support and related functions. It is also responsible for recommending and implementing strategic technology solutions to individual staff members of the Faculty.

Currently, the TSG consists of 9 full time staff members whose duties range from overseeing computer systems and network administration, to IT management. All 9 members of the TSG are under 35 years of age, and have been with the faculty for less than 2 years, respectively. Some members of the group specialise in a specific network and/or computer language, and are available only for requests concerned with their specialisation. All members participated in the study.

#### *4.7.2 Customers of the IT Service*

As outlined above, the Faculty of Commerce and Economics currently consists of 9 Schools, the Dean's Unit, and the Faculty Office. The Faculty employs just under 300 academic and administrative support staff. Any staff member of the Faculty has the right to request IT services from the TSG - that is, he or she is a potential customer.

For the purpose of this study, the modified SERVQUAL questionnaires were distributed to 97 potential customers and 89 questionnaires were returned at a response rate of 92%. Of 89 respondents, 65 have used IT services from

the TSG at least once, and were included in the study. The profile of the 65 “customer” participants is summarised in Table 4.5.

**Table 4.5: Customer Profile**

<b>Customer Variable</b>	<b>No. of participants</b>
<b>Position</b>	
Associate Professor/Visiting Fellow/Associate Dean	7 (11%)
Lecturers	36 (55%)
Administrative Assistants	11 (17%)
Research Students	8 (12%)
No Response	3 (5%)
<b>Total : 65</b>	
<b>Number of Years in the Faculty</b>	
1 to 5 years	42 (65%)
6 to 10 years	14 (22%)
Over 10 years	6 (9%)
No Response	3 (5%)
<b>Total : 65</b>	
<b>Age</b>	
Under 25	7 (11%)
25 to 35	19 (29%)
35 to 45	20 (32%)
Over 45	19 (29%)
<b>Total : 65</b>	
<b>Frequency of IT Service Requests</b>	
Less than once every quarter	36 (55%)
At least once every month	18 (28%)
At least once every week	20 (31%)
<b>Total : 65</b>	

Furthermore, participants were asked to indicate the type of IT service they requested. 6 types of IT service included in the survey were identified at a meeting with the TSG manager as the 6 most popular types of IT service requested by customers; see *Chapter 4.4*. The types of IT service requested by customers is shown in Table 4.6.

***Table 4.6: Requested IT Service***

Type of IT Services Requested	% of Yes Response
Repairs	40 (61.5%)
Computer Laboratory Assistance	23 (35.4%)
Virus Prevention and Removal	11 (16.9%)
Installation of Hardware & Operating Systems	48 (73.8%)
Technical Support for Administration & Teaching	32 (49.2%)
General Assistance	41 (63.1%)

## **4.8 Conclusion**

A survey method was adopted in this study within the time and access restrictions imposed by the Masters Programme. The questionnaire survey instrument was supplemented by informal, on-the-spot interviews with participants who agreed to discuss their responses.

The Faculty of Commerce and Economics which consists of 9 schools, the Dean's Unit, and the Faculty office, was selected due to ease of access and its possession of an exclusive-to-Faculty, internal IT department - TSG. Meetings were arranged with participants from 8 schools, the Dean's Unit and the Faculty Office for them to complete a questionnaire and in some cases a short interview.

The 74 questionnaires used in this study were mainly collected on the spot, with the rest of the questionnaires being returned by participants at a later date. Due to the collection on-the-spot method used, the response rate was quite high at 92%.

## **CHAPTER 5**

### **FINDINGS AND ANALYSIS I**

#### **THE PM SYSTEM**

*"In the electronic age, the effectiveness of organisations depends on technical and political cooperation which permits easy communication." (Paul A. Strassmann, 1985)*

#### **5.1 Introduction**

This Chapter reports on the findings to the research questions raised in Chapter 3 concerning the construct validity and the applicability of the SERVQUAL instrument in an internal services setting. As discussed in Chapter 3.3, there has been some concern regarding the dimensionality of service quality and whether the original dimensions in the SERVQUAL instrument can be applied in internal services. Furthermore, there has been questions raised regarding the application of difference-score measures, and whether they are different from the actual scores (perception-only scores).

The following sections consider the results to the reliability analysis and the factor analysis carried out on the SERVQUAL instrument used in the current study to consider the above research questions.

## 5.2 Reliability Analysis

The reliability analysis was carried out to assess the internal consistency of the 4 service dimensions by PZB - *reliability, responsiveness, assurance and empathy* in internal service settings. The tangibility dimension of service was omitted in this study; see *Chapter 4.5*.

Reliability coefficients (Cronbach Alphas) were computed for the 4 service dimensions for the actual levels of IT service, since the actual level was found to be the most consistent level of IT service from the test-retest carried out in Chapter 4.5.1. Reliability coefficients for the difference-score measures were also calculated since the SERVQUAL instrument is concerned with the 'gaps'. That is, difference-score measures of these gaps, which exist between customers and suppliers of IT service, determine the service quality. Furthermore, alphas for difference-score measures were compared against the 3-column-format SERVQUAL in PBZ (1994). Table 5.1 presents the reliability coefficients of the 4 service dimensions.

Theoretically, the coefficient alphas should achieve above the 0.70 level to be considered reliable in commercial applications; *Carmen (1990)*. In this study, this was achieved by alphas for the actual level of IT service in all 4 dimensions, and by alphas in 3 of 4 service dimensions for difference scores. Only the Assurance dimension, when measured by a difference score, failed to achieve 0.70.

***Table 5.1: Reliability Coefficients (Alphas) for the PZB Service Quality Dimensions***

<b>Service Dimension (for this study)</b>	<b>Actual Level</b>	<b>Ideal relative to Actual (difference scores)</b>	<b>3-column PBZ (1994)*</b>
<b>Reliability (4 items)</b>	.81	.81	.92
<b>Responsiveness (4 items)</b>	.84	.83	.87
<b>Assurance (3 items)</b>	.74	.65	.87
<b>Empathy (4 items**)</b>	.73	.79	.90

*Note: Alphas are from PBZ (1994)'s Three-column, perception relative to desired level of service.*

*\*\* Question 13 was omitted from the analysis since less than half of the participants indicated that they have used IT services outside business hours.*

The reliability coefficients obtained for this study when contrasted against the alphas computed in the PZB (1994) study's 3-column-format SERVQUAL, where the internal validity of the 4 service dimensions were found to be extremely consistent and reliable, were substantially lower. Indeed, while most of the alphas achieved 0.70 level for both actual and difference-score measures, there were some concerns regarding the reliability of the 4 service quality dimensions of the current study, especially for the assurance dimension for difference-score measures; see *Table 5.1*. Thus, in order to test the dimensionality of service further, the next section carries out a factor analysis of the SERVQUAL items considered in the study.

### **5.3 Factor Analysis**

As discussed in Chapter 3.2.1, the dimensionality of service applied in SERVQUAL instrument has been under criticism since its conception. This



criticism is not without its merit as the earlier SERVQUAL replication studies found the dimensions to be inconclusive; see *Table 3.3*.

More recently, PZB (1994) also questioned the validity of their 5 original service dimensions by acknowledging that more research is needed towards the dimensionality of service in various industry settings. Unfortunately, despite this acknowledgement, none of the SERVQUAL replication studies since 1994 considered the dimensionality in detail; see *Chapter 3.3*.

In order to examine the dimensionality of service in the internal services setting used in the current study, the 15 SERVQUAL items were factor analysed to further examine their distinctiveness. *Table 5.2* reports the Varimax rotated factor-loading matrices based on the actual levels of IT service (perceptions only) and the difference scores where the 15 items were loaded onto 2 factors.

The reason for factor analysing both actual and difference score measures is based on the earlier criticism of the difference-score measures of the SERVQUAL instrument, and to see whether Brown *et al.* (1993)'s claim that the perception only scores are psychometrically better; see *Chapter 3.2.1*.

As it can be seen in *Table 5.2*, however, the factor analysis found that there is no difference between difference-score and actual score measures in the IT service setting – the internal services setting selected for the current study.

**Table 5.2: Factor Loading Matrices\***

ITEMS (PZB DIMENSIONS)	ACTUAL LEVEL		DIFFERENCE SCORE (IDEAL relative to ACTUAL)	
	Factor 1	Factor 2	Factor 1	Factor 2
RELIABILITY				
Q1	36	75	40	71
Q2	37	64	36	66
Q3	66	39	61	39
Q4	58	47	54	46
RESPONSIVENESS				
Q5	--	86	--	88
Q6	--	84	--	88
Q7	35	83	46	67
Q8	85	--	81	--
ASSURANCE				
Q9	81	--	76	--
Q10	67	35	70	--
Q11	66	--	46	--
EMPATHY				
Q12	63	39	70	--
Q14	68	--	74	--
Q15	82	--	85	--
Q16	53	--	51	--

\* Number shown are loadings multiplied by 100. Loadings less than .3 have been omitted as per PBZ (1994). Q13 was again omitted from the analysis since less than half of the responses were applicable.

From Table 5.2, it can clearly be seen that in the internal service settings, or at least for the IT setting of this study, the 4 service dimensions identified by PZB do not hold. Instead, there were only 2 distinct service dimension factors, Factor 1 and Factor 2, for both actual and difference-score measures. The reliability coefficients for the 2 new dimensions found are summarised in Table 5.3.

**Table 5.3: Reliability Coefficients for the IT Service Dimensions**

Service Dimension	Actual Level	Difference Scores (Ideal relative to Actual)
Factor 1 (10 items)	.84	.83
Factor 2 (5 items)	.88	.87

The reliability alphas for 2 factors for both the actual and the difference-score measures are substantially above 0.70 level. In addition, the alphas are also higher than those acquired for the 4 original service dimensions shown in Table 5.1. That is, the internal consistency of the 2 new service dimensions was much more reliable for the current study's IT services setting than the 4 dimensions normally associated with the SERVQUAL instrument.

Upon further analysis of the 2 dimensions, it was revealed that each dimension is indeed very distinct and specific. Factor 1 items are concerned with the attributes of the TSG personnel. That is, the 10 items loaded under Factor 1 in Table 5.2 deals with the ***quality of TSG personnel***. Meanwhile, the 5 items loaded under Factor 2 consider the ***quality of IT service***. That is, they are concerned with the IT service attributes. The distinctiveness of these 2 factors can clearly be seen in Table 5.4.

From Table 5.4, it can be seen that Factor 1 items constituted of the attributes of TSG personnel. This can be identified by the phrase, "*the TSG personnel*" in the SERVQUAL question. Meanwhile, Factor 2 items were concerned with the IT service attributes, identified by presence of the words, "*requested*" and/or "*services*".

The reliability and factor analyses raised 2 very interesting points. Firstly, it seems that in the internal service settings, SERVQUAL items do not neatly fit into the traditional service dimensions introduced by PZB. Instead, only 2

distinct dimensions were found to exist in the SERVQUAL instrument used in the current study, based on whether an item deals with the TSG personnel's personal attributes, or with the attributes of IT service being provided.

***Table 5.4: Internal Service Dimensions\****

SERVQUAL QUESTIONS	FACTOR 1 TSG PERSONAL ATTRIBUTES	FACTOR 2 IT SERVICE ATTRIBUTES
1		<i>(Requested) IT services are received within a reasonable timeframe.</i>
2		<i>(Requested) IT services are right the first time.</i>
3	<i>TSG personnel show sincere interest in solving problems.</i>	
4	<i>TSG personnel keep appointments.</i>	
5		Users are told of the completion date for <i>IT services</i> .
6		Users are informed about the statues of <i>IT services</i> .
7		<i>(Requested) IT services are received promptly.</i>
8	<i>TSG personnel are willing to help.</i>	
9	<i>TSG personnel are trustworthy.</i>	
10	<i>TSG personnel are courteous.</i>	
11	<i>TSG personnel have the expertise.</i>	
12	<i>TSG personnel are available during business hours.</i>	
14	<i>TSG personnel provide individual attention.</i>	
15	<i>TSG personnel have the best interests of users at heart.</i>	
16	<i>TSG personnel understand specific user problems.</i>	

\* Questions from the SERVQUAL survey have been paraphrased to emphasize the attributes.

Given the exclusion of the tangibility dimension of service, it is rather difficult to compare this factor analysis to that of the PBZ (1994) analysis for the 3-column format SERVQUAL. That is, it is unclear as to what would happen to the PZB dimensions without the tangibility dimension. However, it must also

be noted that in their 1994 study, PZB conceded that assurance and empathy dimensions can be merged together, and that the dimensions need more testing, especially in different service settings. That is, the current study's 2 very distinct service dimensions are surprising but not necessarily unexpected. Indeed, this affirmed Reynoso & Moore (1995)'s apprehension regarding the direct transferability of SERVQUAL into the internal service settings; see *Chapter 3.4.1*.

Secondly, the analyses showed that at least in the current study's IT service setting, there is no difference between the actual (perceptions only) scores and the difference-score measures in terms of the dimensionality and its reliability. That is, the psychometric concerns regarding the gap measurements are absent from the current study's IT service setting. Given this lack of difference between the two measures, the current study selects the difference-score measures to measure the performance of an IT department for their greater explanatory and diagonal values; see *Chapter 3.3*.

## **5.4 Conclusion**

As discussed in Chapter 3.3, existing SERVQUAL replication studies have raised concern regarding the dimensionality of service applied in the SERVQUAL instrument in the internal services setting, as well as the use of difference-score measures in favour of the actual scores.

In this Chapter, the dimensionality and applicability of the SERVQUAL items used in the study were analysed using the reliability analysis and factor analysis. These analyses found that:

- There is no difference between the actual (perception only) scores and difference-score measures. That is, the psychometric concerns regarding the gap score measures were absent from the participants of the current study. Given the lack of difference between the two measures, the current study selects the gap score measures for their superior diagnostic and explanatory values.; and,
- The concerns regarding the dimensionality of service in the internal services setting are justified. Indeed, only 2 very distinct service dimensions were found for the SERVQUAL instrument applied in the IT service setting used in this study.

Results from the current study supports the notion that the dimensionality of SERVQUAL is still an ongoing research topic for SERVQUAL and service quality studies. That is, researchers should never simply apply the 5 service dimensions introduced by PZB in different service settings. Indeed, it seems that the service dimensionality for internal services is different from that of the external service settings previously examined in external SERVQUAL studies, and more research is needed before the generalisation of the SERVQUAL instrument can be accepted.

# **CHAPTER 6**

## **FINDINGS AND ANALYSIS II**

### **MEASUREMENT OF SERVICE PERFORMANCE**

#### **PART 1**

*“All information is imperfect. We have to treat it with humility”, (J. Bronowski)*

#### **6.1 Introduction**

This Chapter reports on the measurement of IT service performance using the ‘gaps model’ and the SERVQUAL instrument developed in the current study. In this study, the service performance of an IT department (TSG) was measured using the 7 gaps identified in the conceptual model of IT service developed in Chapter 2; see *Figure 2.3*. The 7 gaps were measured by a modified version of the SERVQUAL questionnaire, which were collected from the 74 participants who are customers and suppliers of IT service within a Faculty of Commerce and Economics at one of the leading universities in Australia. Furthermore, a series of informal interviews were conducted with 35 of the 74 participants regarding their perceptions of IT service provided by the TSG.

The following section examines the overall measurement of IT service performance of the TSG. This is followed by the analyses of IT performance according to the 2 internal service dimensions identified in Chapter 5.3.

Furthermore, individual analyses of each of the 7 gaps are carried out to further examine the performance of the TSG. The final section contains a summary.

## **6.2 Overall Measurement**

For the purpose of this study, the profile of the customer participants, collected via Part A of the survey questionnaire, were categorised into 5 demographic variables – School, position, age, number of years in the Faculty, and frequency of use; see *Appendix 1A*. The categorisation of these 5 variables is in Table 6.1.

Initially, a multiple analysis of variance (MANOVA) was performed to examine whether the 5 customer variables mentioned above influenced the customer participants' responses to the SERVQUAL questions regarding the quality of IT service; see *Table 6.2*. From Table 6.2, it can be seen that none of the variables affected the participants' perceptions of the acceptable and actual levels of IT service. That is, they were found to cause statistically insignificant differences to their perceptions of the level of acceptable and actual levels of IT service provided by the TSG. Furthermore, only two demographic variables, *position* and *number of years in the Faculty*, were found to influence the ideal level of IT service at a 95% significance level.

As a result, it was decided that for the purpose of this study, the main statistical tool should be the difference score (gaps) measures and their significance.



***Table 6.1: Categorisation of Customer Variables***

<b>Variable/Categories</b>	<b>Components</b>	<b>Reasons behind categorisation</b>
<b>School</b>		
Group 1 - Schools with Computer Support of their own (SCS)	<ul style="list-style-type: none"> <li>Accounting</li> <li>Banking and Finance</li> <li>Economics</li> <li>SILAS</li> </ul>	Existence of a school-based computer support personnel
Group 2 – IS	<ul style="list-style-type: none"> <li>IS</li> </ul>	Most frequent customer (according to the TSG 'request logbook')
Group 3 - Dean's Unit (DU)	<ul style="list-style-type: none"> <li>Dean's Unit</li> </ul>	Non 'school' category
Group 4 - Others	<ul style="list-style-type: none"> <li>Marketing</li> <li>IROB</li> <li>International Business</li> </ul>	Least frequent customer of IT service
<b>Position</b>		
Group 1 - Professors	<ul style="list-style-type: none"> <li>Associate Professors</li> <li>Visiting Fellows</li> <li>Associate Deans</li> </ul>	Participants with administrative assistants
Group 2 - Lecturers	<ul style="list-style-type: none"> <li>Senior Lecturers</li> <li>Lecturers</li> <li>Associate Lecturers</li> </ul>	Participants requesting IT services for teaching duties
Group 3 - Secretaries	<ul style="list-style-type: none"> <li>Administrative Assistants</li> <li>Research Assistants</li> </ul>	Non-teaching participants
Group 4 - Students	<ul style="list-style-type: none"> <li>Casual Tutors</li> <li>Research Students</li> </ul>	Participants using IT services for their own studies/projects
<b>Number of years in the Faculty</b>		
Group 1	<ul style="list-style-type: none"> <li>1 to 5 years</li> </ul>	
Group 2	<ul style="list-style-type: none"> <li>5 to 10 years</li> </ul>	
Group 3	<ul style="list-style-type: none"> <li>Over 10 years</li> </ul>	
<b>Age</b>		
Group 1	<ul style="list-style-type: none"> <li>Under 25</li> </ul>	
Group 2	<ul style="list-style-type: none"> <li>25 to 35</li> </ul>	
Group 3	<ul style="list-style-type: none"> <li>35 to 45</li> </ul>	
Group 4	<ul style="list-style-type: none"> <li>Over 45</li> </ul>	
<b>Frequency of Use</b>		
Group 1	<ul style="list-style-type: none"> <li>Quarterly or Less</li> </ul>	
Group 2	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	
Group 3	<ul style="list-style-type: none"> <li>Weekly or More</li> </ul>	

***Table 6.2: MANOVA for 3 Levels of IT Service vs. 5 Customer Variables***

Customer Variables	Ideal Level		Acceptable Level		Actual Level	
	F Value	Sig.	F Value	Sig.	F Value	Sig.
School	0.572	0.814	0.613	0.781	0.971	0.474
Position	2.071	0.043	1.826	0.078	1.086	0.389
Age	0.409	0.965	0.751	0.714	0.768	0.697
Number of years in the Faculty	4.472	0.007	2.485	0.069	0.610	0.611
Frequency of Use	0.707	0.621	0.254	0.936	1.468	0.214

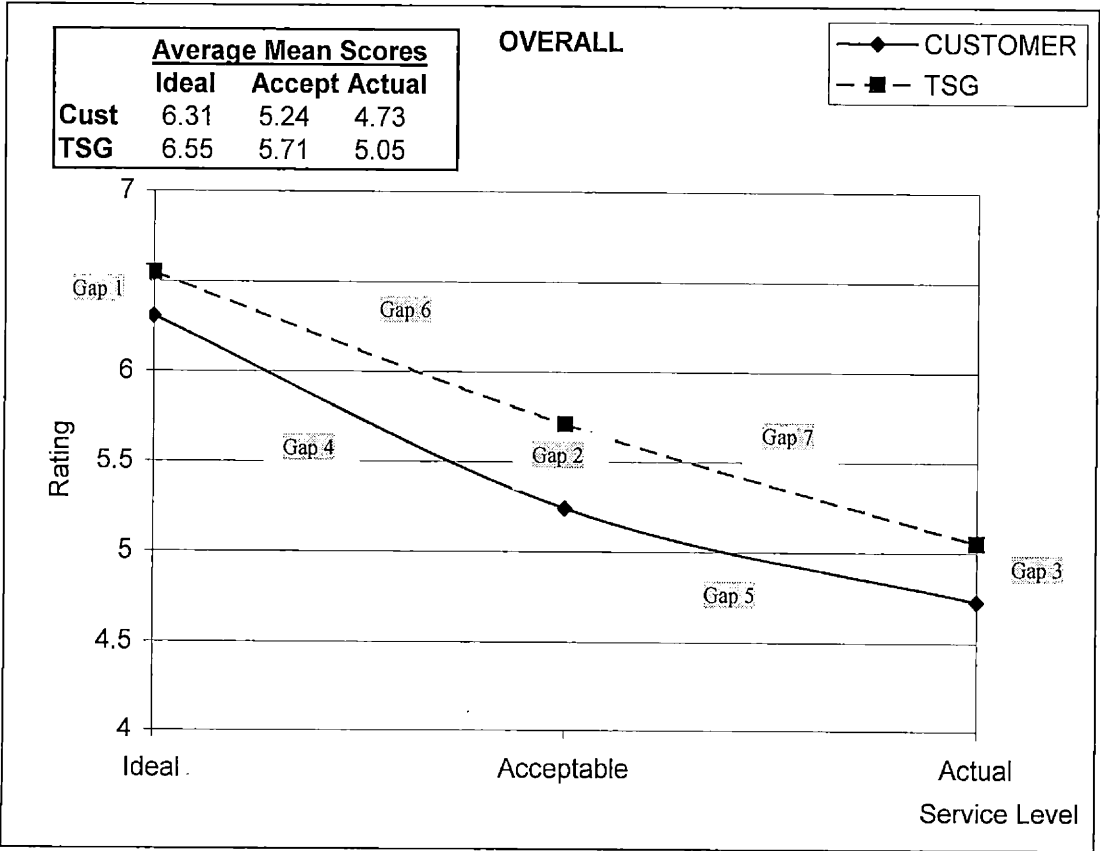
As identified in Figure 2.3, there are 7 gaps that exist between and within the suppliers and customers of IT service. For the purpose of this study, the difference scores for gaps 4 to 7 were measured by calculating the gaps for individual questions (that is, Ideal level Q1 – Acceptable level Q1, Acceptable level Q1 – Actual level Q1) for each customer or supplier participant, and then the average mean scores were obtained. For gaps 1 to 3, the average mean scores were calculated by subtracting the customers' responses from the suppliers' responses to the 3 levels of IT service. The significance of each of these gaps was then determined by 2 non-parametric tests at a 95% significance level.

The main reason for using non-parametric tests was due to the ordinal nature of the data collected from the survey questionnaire, since customers and suppliers were asked to 'rank' out of 7, the 16 Likert-type questions in the SERVQUAL instrument. For the gaps 1 to 3, that is, the differences *between* customers and suppliers' perception of IT service levels, the Mann-Whitney test, which tests for the equivalence or differences of two independent samples, was used. For the gaps 4 to 7, which exist within suppliers and customers, the Wilcoxon non-parametric procedure was used to test for the

differences between the two related variables – for example, ideal vs. acceptable level of service for customers. A list of complete results from the non-parametric tests is contained in Appendix 3.

Figure 6.1 shows the mean scores for the 3 levels of IT service, and depicts the 7 gaps for the overall measurement of IT service. The statistical significance of these gaps is discussed in the following sections.

**Figure 6.1: Overall Comparison of Customer/Supplier Service Levels**



	GAP 1	GAP 2	GAP 3	GAP 4	GAP 5	GAP 6	GAP 7
Significant at 95% level?	No	No	No	Yes	No	Yes	Yes

\* see Appendix 3 for z scores and significance test statistics.

The “average mean scores” in Figure 6.1 show the average ratings by customers and suppliers of TSG service regarding the 3 levels of IT service identified in the conceptual model of internal service quality, and are out of a maximum rating of 7, minimum of 1. The 7 gaps identified in the conceptual model (see Figure 2.3) are also shown in Figure 6.1, where gaps 1,2 and 3 are the differences between customers and suppliers, gaps 4 and 5, within customers, and gaps 6 and 7, within suppliers.

Figure 6.1 clearly shows that there was no noticeable difference between the suppliers and customers’ overall ideal, acceptable and actual levels of IT service; *Gaps 1,2 and 3*. This was statistically supported at a 95% significance level; see *Appendix 3*. That is, the differences between the customers and the TSG personnel’s ideal, acceptable and actual levels of IT service were found to be small. It should also be noted that all 3 levels of IT service were higher for the TSG personnel than the customers.

However, the slope of the first section of line graph in Figure 6.1, for both customers and the TSG shows there were large differences between the ideal and acceptable levels of IT service for both suppliers and customers. Indeed, gaps 4 and 6 were found to be significant; *also see Appendix 3*. This indicates that both the TSG personnel and customers were aware of limitations imposed on the suppliers of IT service due to technology, personnel and other organisational factors. Furthermore, customers were willing to accept a level of service, which is significantly less than their ideal level, shown by the significance of gap 4.

Two most interesting aspects about the overall measurement of IT service performance were gap 5 and gap 7, the differences between acceptable and actual levels of IT service for customers and for the TSG personnel. From Figure 6.1, it can be seen that while gap 5 was not significant, gap 7 was. That is, although customers perceived the overall actual performance of the TSG to be acceptable, the TSG personnel believed that the level of IT service they provided were significantly lower than the acceptable level.

To analyse these findings further, the overall difference score (D. score) measures for 7 gaps were also examined according to the 2 internal service dimensions identified in this study; see *Chapter 5.3*. The respective gap scores are analysed in the following sections.

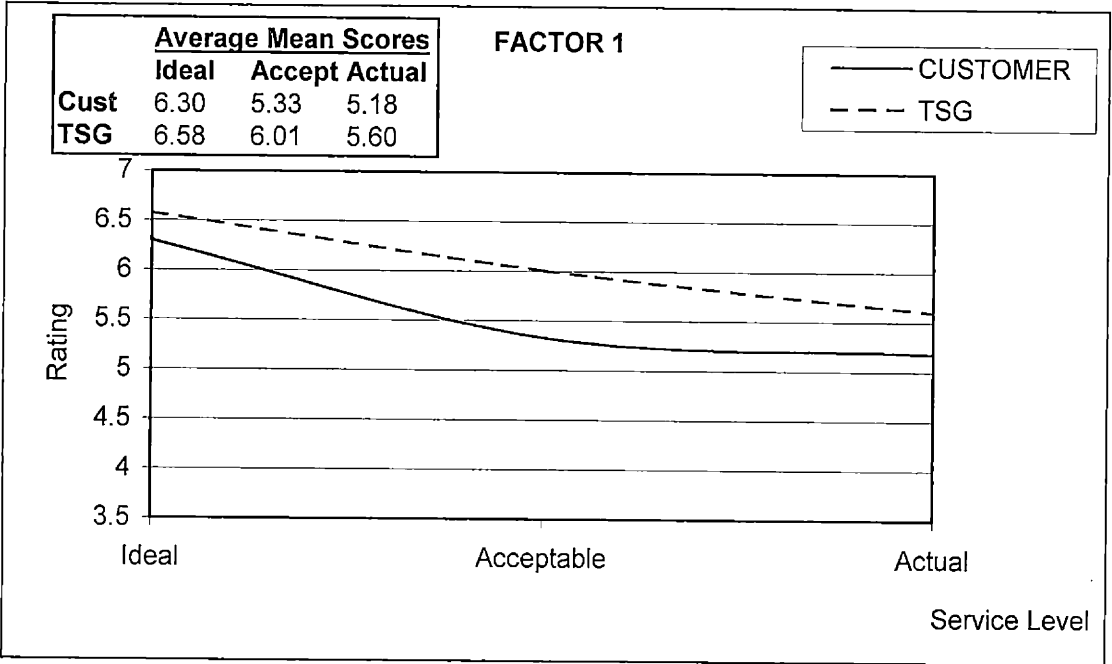
### ***6.3 IT Service Dimension - Factor 1: TSG Personnel Attributes***

As discussed in Chapter 5.3, Factor 1 dimension of IT service is concerned with the personal attributes of the TSG personnel. That is, this particular dimension is concerned with the ability of TSG personnel in dealing with customers' requirements and expectations. Theoretically, it measures the 'people skill' of the TSG personnel.

Figure 6.2 shows that there was no significant difference between customers and suppliers' ideal and actual levels of IT service regarding Factor 1 – gaps 1 and 3. Surprisingly however, it was found that the TSG personnel held a notably higher level of acceptance than the customers; Gap 2. This is

depicted by line graphs in Figure 6.2, where the difference between customers and TSG at the acceptable level is greater than at the ideal and actual levels.

**Figure 6.2: Factor 1 Dimension Comparison of Customer/Supplier Service Levels**



	GAP 1	GAP 2	GAP 3	GAP 4	GAP 5	GAP 6	GAP 7
Significant at 95% level?	No	Yes	No	Yes	No	Yes	Yes

\* see Appendix 3 for z scores and significance test statistics.

Furthermore, the TSG personnel perceived that the actual level of service concerning their personal attributes was significantly lower than what they perceive as acceptable (gap 7). In another word, their service was *unacceptable* to their own standard. This can be contrasted with the customers' perception of the actual level. They were found to be willing to accept a notably lower level of service than the ideal level, shown by the significance of gap 4, and they perceived the actual level of service to be

*acceptable*, shown by the insignificance of gap 5. This is again depicted in Figure 6.2, where slope of customers' line graph almost flattens between acceptable and actual levels of IT service, whereas the suppliers' line graph continues to drop.

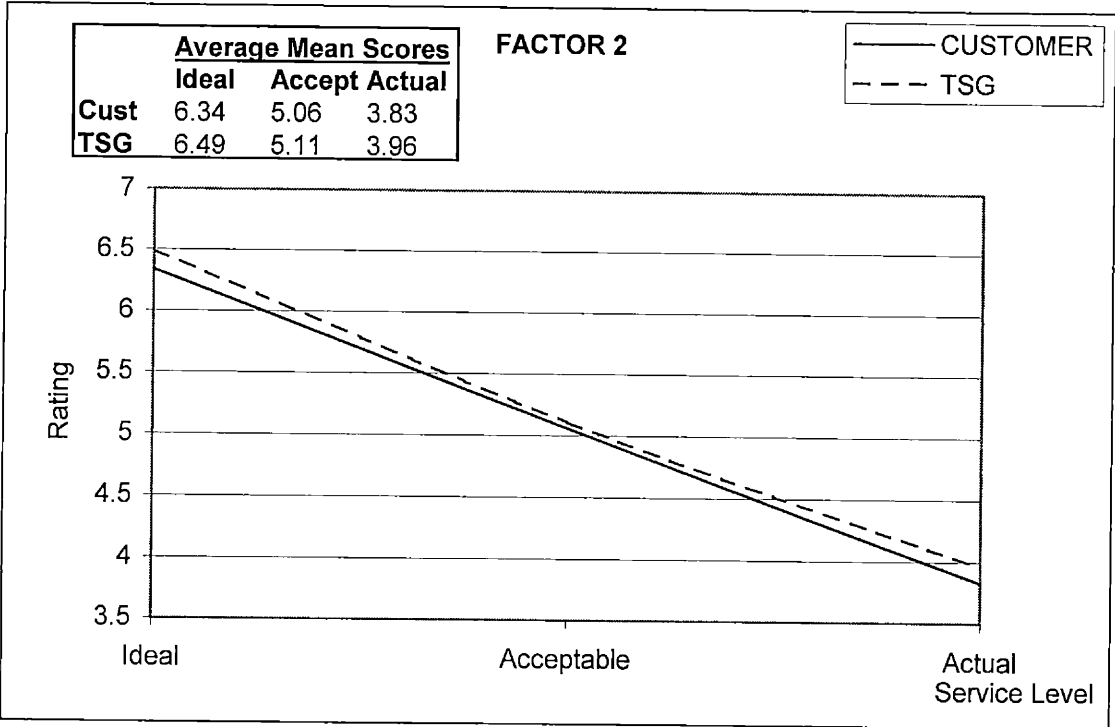
#### **6.4 Service Dimension - Factor 2: IT Service Attributes**

The second internal service dimension identified in the current study is concerned with the attributes of IT service itself. That is, this particular dimension of service is concerned not with the delivery process of the TSG personnel, but with the delivered services. Getting the requested IT service within a reasonable timeframe, and getting the right service the first time are some of the examples of this particular IT service dimension.

It was found that there was no significant difference between the customers and the TSG personnel's perception of the 3 service levels; *Gaps 1,2 and 3*. Indeed, they were almost identical, depicted by the line graphs in Figure 6.3. That is, for the Factor 2 dimension of IT service, there was no misconception between customers and suppliers regarding the 3 levels of IT service.

However, gaps 4, 5, 6, and 7, the differences between ideal and acceptable, and acceptable and actual levels of IT service for customers and suppliers, were found to be significant. That is, despite both parties' willingness to accept less than what is ideal (gaps 4 and 6), they perceived the actual level of IT service to be *unacceptable*, shown by the significance of gaps 5 and 7.

**Figure 6.3: Factor 2 Dimension Comparison of Customer/Supplier Service Levels**



	GAP 1	GAP 2	GAP 3	GAP 4	GAP 5	GAP 6	GAP 7
Significant at 95% level?	No	No	No	Yes	Yes	Yes	Yes

\* see Appendix 3 for z scores and significance test statistics.

The measurement of the 7 gaps according to the two service dimensions identified in the current study yielded two interesting findings. They were:

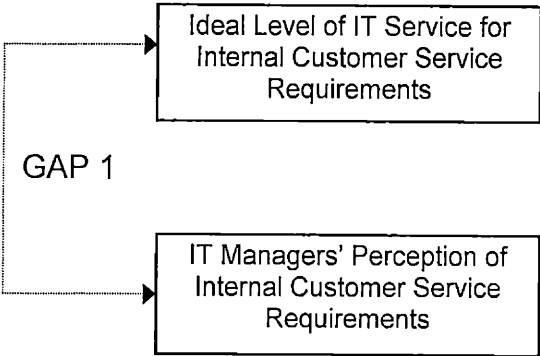
- Customers were found to be quite happy with the TSG personnel’s personal attributes (Factor 1). Furthermore, it was the suppliers who held much higher acceptance level than the customers; and,
- Customers were unhappy with the IT services themselves (Factor 2). That is, despite their willingness to accept a significantly lower level of service, they found the actual level of IT service itself to be unacceptable. The



customers' unhappiness with the actual level of IT service was however known to the TSG personnel, shown by the insignificance of gap 3.

The following sections individually examine the significance of the 7 gaps in more detail, with respect to informal interviews conducted with both suppliers and customers of the IT services.

6.5 Gap 1



(Excerpt from Figure 2.3)

Significance (Mann-Whitney test)

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	sig	D. score	sig	D. score	sig
GAP 1	0.15	0.461	0.29	0.165	0.15	0.427

(Excerpt from Appendix 3)

Gap 1, depicted above can be defined as the difference between the level of service customers would like to receive, and the level of service suppliers perceive that they should be providing to meet the customers' needs. The Mann-Whitney test found that gap1 is insignificant overall, and for both IT service dimensions. Interestingly enough however, it was the TSG personnel who gave higher ratings to each service dimension; see Figure 6.1, 6.2, and 6.3.

According to the customers who were interviewed, the ideal level of IT service is the level of service they **want** from the TSG, whereas the TSG personnel considered the ideal level to be the level of IT service the customers **need** in order to meet the requirements. When asked about the possible distinction between the two, one TSG personnel replied;

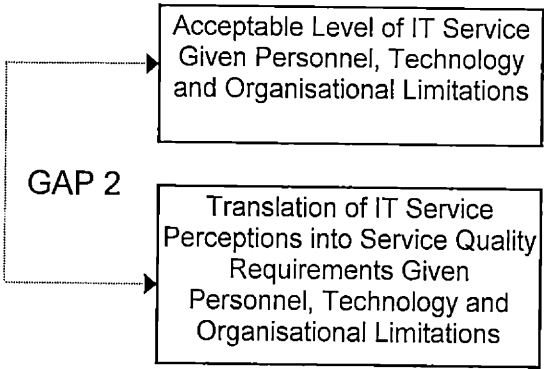
*"What they (customers) want may not be what they need to solve problems. Given the limited resources, we have to provide what they need, rather than satisfy what they want..."*

The most interesting finding for Gap 1 was the popular belief held by suppliers that customers expect too much, although the TSG personnel gave higher ratings than the customers as discussed above. Indeed, every TSG personnel interviewed held the following opinion:

*"Yes, I do believe that, sometimes, they expect too much from us."*

Regardless, there was no significant difference between the suppliers and the customers' ideal level of IT service. Gap 1 depicted above was found to be insignificant overall, and for both dimensions of service.

6.6 Gap 2



(Excerpt from Figure 2.3)

Significance (Mann-Whitney test)

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	sig	D. score	sig	D. score	sig
GAP 2	0.36	0.191	0.68	0.025	0.05	0.907

(Excerpt from Appendix 3)

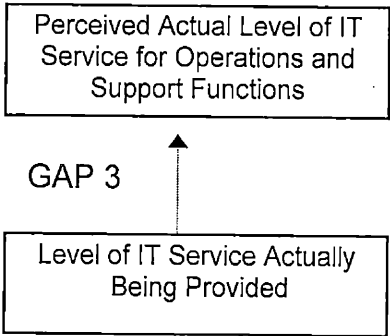
Gap 2 is the difference between the customers and the suppliers' acceptable level of IT service. The above excerpt from Figure 2.3 shows that this particular level of IT service can be influenced by the personnel, technology and any other organisational limitations, and the understanding of these limitations by the customers.

Although the overall gap 2 was found to be insignificant, it was found to be significant at a 95% level for the **Factor 1: TSG Personal Attributes** dimension; see above excerpt. However, it is worth noting that the significance was due to the TSG personnel having a higher acceptable level of IT service than the customers, not vice versa; see Figure 6.2. That is, it was the customers who were more willing to accept a lower level of IT

service. Indeed, they understood and acknowledged the limitations imposed on the TSG personnel due to technology, personnel and other organisational factors.

For the Factor 2 dimension of IT service, gap 2 was found to be insignificant. That is, both customers and suppliers were aware of the limitations imposed on the level of IT service provided by the TSG personnel.

6.7 Gap 3



(Excerpt from figure 2.3)

Significance (Mann-Whitney test)

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	Sig	D. score	sig	D. score	sig
<b>GAP 3</b>	0.12	0.908	0.41	0.394	0.15	0.772

(Excerpt from Appendix 3)

Gap 3 is the difference between the suppliers and customers' perceptions of the actual level of IT service. That is, it is the difference between what customers perceive to be the level of IT service they have received, and what suppliers perceive to be the level of service they have provided to customers.

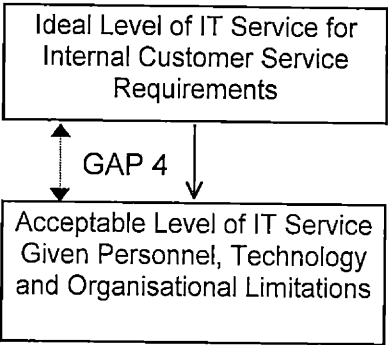
Ideally, gap 3 should not be significant. That is, there should not be a notable difference between customers and suppliers' perception of the actual level of IT service. Given the lack of significance for overall gaps 1 and 2, it was not surprising to find that there was no overall significant difference between the suppliers and customers' perception of the actual level of IT service, nor for the 2 service dimensions. That is, there was no serious misconception regarding the actual level of IT service between customers and suppliers of IT service; *see above table excerpt*.

This was quite encouraging from the suppliers' point of view. Despite their concerns that customers may be expecting too much, the customers' perception of the actual level of IT service was statistically the same as the TSG personnel's perception.

In summary, there were no significant differences between the customers and suppliers' perceptions of the 3 levels of IT service (gap 1, 2, and 3), except for the Factor 1's gap 2 where the suppliers' perception of acceptable level was higher than the customers. This is one of the most crucial findings to the study. From the conceptual model of IT service quality, any gap between customers and suppliers would be due to the lack of communication or understanding between the two parties. Given this lack of significant differences for the ideal and actual levels of IT service, it can be concluded that the TSG, an internal service department within the Faculty of Commerce and Economics, is aware of its customers' needs and requirements. That is, suppliers are cognisant of service needs of customers, what customers want,

and how customers rate their personnel and services. However, suppliers hold statistically higher level of acceptance than their customers do.

6.8 Gap 4



(Excerpt from figure 2.3)

Significance (Wilcoxon test)

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	Sig	D. score	sig	D. score	sig
GAP 4	1.08	0.000	0.97	0.000	1.28	0.000

(Excerpt from Appendix 3)

Gap 4 can best be explained as the difference between the level of IT service customers would like to receive and the level of IT service they are willing to accept. As discussed earlier, the acceptable level represents the minimum level of IT service customers are willing to be contend with, given the limitations of technology, personnel and other organisational factors such as budget; see Chapter 2.5.

In the above table excerpt, gap 4 was found to be significant overall, as well as for the 2 service dimensions considered in this study. Furthermore, gap 4 was found to be significant for all of the SERVQUAL questions considered in

this study; see *Appendix 3*. This is quite interesting as it indicates that customers were quite aware of the problems associated with the limitations faced by the TSG personnel in providing IT services. As a consequence, they were found to be willing to accept the level of IT service which is NOT what they might consider as ideal. This rather surprising acceptance of less-than-ideal service level was further probed during the interviews conducted. One particular comment stood out in regards to this acceptance. Almost all customers interviewed pointed out that:

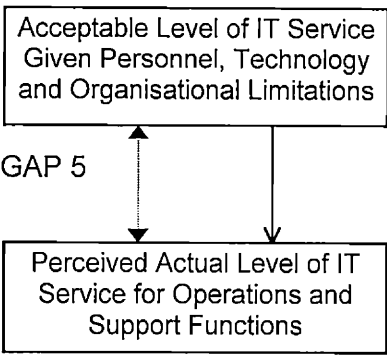
*"It is not a perfect world".*

Also, it was found that customers who had previous experiences dealing with activities associated with 'IT' were more likely to accept a lower level of IT service than others. One customer pointed out:

*"Ideal means with all the bells and whistles...I know there are limitations faced by the TSG personnel. What I need is the bare minimum to satisfy my requirements...I'd be happy with that."*

The universal significance of gap 4 indicates that the customers of the TSG department were not unreasonably expecting the impossible from the suppliers. Indeed, they were found to have the 'understanding' of limitations imposed on the suppliers of IT service, and accordingly, they were willing to accept significantly lower levels of IT service than what they believe is the ideal.

6.9 Gap 5



(Excerpt from figure 2.3)

**Significance (Wilcoxon test)**

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	Sig	D. score	sig	D. score	sig
GAP 5	0.39	0.061	0.14	0.476	1.25	0.000

(Excerpt from Appendix 3)

Gap 5 is defined as the difference between the acceptable level and the perceived actual level of IT service by customers. Essentially, gap 5 is an indicator of the IT service performance from the customers’ perspective. Ideally, if the TSG department is performing well, the customers’ actual level of IT service should be better than or at least equal to the acceptable level of IT service. That is, gap 5 should not be significant.

The overall gap 5 was found to be insignificant at a 95 % level. This was also true for the Factor 1 dimension of service. Figure 6.2 shows that from the customers’ point of view, the acceptable and actual levels of IT service for Factor 1 were statistically identical. However, the service dimension dealing with the IT service attributes (Factor 2) was found to have quite a significant gap 5. That is, the customers found the attributes of IT service being



delivered *unacceptable*. This can also be seen in Figure 6.3 where there is a sharp decline from the customers' acceptable level of service to the actual level of service.

The existence of a significant gap 5 for the Factor 2 dimension, but not for the Factor 1 dimension, can be explained by one of the customers' comment that:

*"Oh, the (the TSG personnel) are such charming people. I am very happy with their personality... I just don't think they are doing such a good job providing services..."*

Another frustrated customer's comment about gap 5 nicely summed up the above discussion. According to the customer, one of the problems associated with the IT service is the TSG personnel's insistence of conducting business via email:

*"I needed to contact the TSG personnel to set up my email account for the first time. Just how do I contact the TSG personnel via email if I don't have a computer set up and running?"*

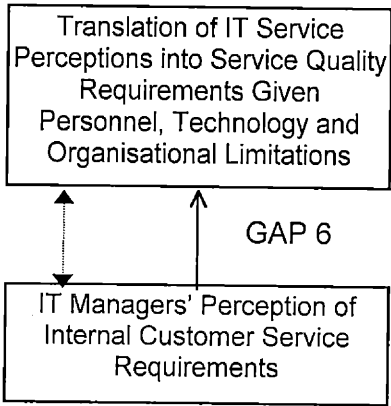
However, he also commented that:

*"Although it was a frustrating experience to actually get the service out of them, when he (the TSG personnel) came around to attend my problems, he was courteous, polite and quite competent – he was a nice guy."*

In summary, there were 2 major findings from the customers' perspective:

- There was a significant gap between what they perceive as the ideal level of IT service and what they are willing to accept (gap 4). That is, customers were aware of the limitations imposed on the TSG personnel, and their understanding of these limitations caused their acceptance of IT service which is significantly lower than their ideal level; and
- Although the customers found the overall service performance of the TSG acceptable, this acceptance did not hold for the Factor 2 dimension of IT service. Customers found the actual level of IT service attributes to be significantly lower than what they are willing to accept.

6.10 Gap 6



(Excerpt from figure 2.3)

Significance (Wilcoxon test)

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	Sig	D. score	sig	D. score	sig
GAP 6	0.87	0.011	0.58	0.021	1.38	0.011

(Excerpt from Appendix 3)

Gap 6 is the difference between the level of IT service perceived by the suppliers as the level they should be providing to meet the customer needs,

and the level of IT service they believe is feasible, given the limitations due to technology, personnel, and other organisational factors. The above table excerpt shows that there was a significant overall gap between what the TSG personnel perceive to be ideal, and what they believe is feasible. This significance was true for both the service dimensions.

During the interviews with the TSG personnel, it was found that although they were more than willing to provide IT services at an ideal level, they recognised the improbability of providing services at the ideal level. Not only are the TSG personnel restricted by the limitations of cost and time, they also have to 'prioritise' some of the requests - it is impossible to keep all customers happy.

Also, it was interesting to note is that the TSG personnel placed most of the blame for being unable to provide the ideal level of service on the priority work which must be done before anyone else's request can be proceeded. For example, if the request comes in from the Dean's Unit, or from the Faculty Office, it must be dealt with as soon as possible. One of the reasons given for this was that most of their requests are linked with important documents such as student records. Furthermore, if the request is concerned with the entire network for an entire school, it must also be dealt with as soon as possible (note that schools operate on different networks to each other).

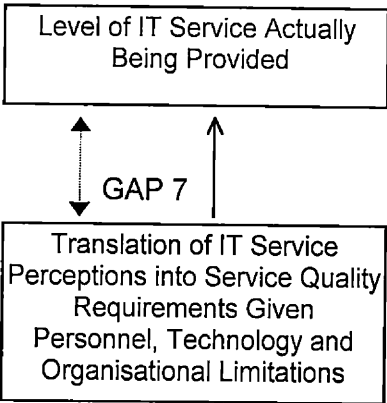
As one participant commented, it seems that:

*“If the request involves total failure of the operating system for an entire school network, that is more important than any individual’s requests. Also, if I have two requests with same priority and at the same time, I have to use my discretion as to which customer is attended first...there is no rule”.*

As another participant pointed out, given that only 9 full time TSG members are responsible for 300 staff members in the faculty, the response to their requests cannot always be ideal. Indeed, as one participant pointed out:

*“We are always willing to respond as soon as possible. It’s just not possible sometimes....”*

6.11 Gap 7



(Excerpt from figure 2.3)

**Significance (Wilcoxon text)**

	OVERALL		FACTOR 1		FACTOR 2	
	D. score	Sig	D. score	sig	D. score	Sig
GAP 7	0.63	0.008	0.41	0.018	1.15	0.008

(Excerpt from Appendix 3)

Gap 7 is defined as the difference between the acceptable or feasible level of IT service, and the actual level of IT service from the suppliers' perspective. That is, it is the difference between what is *possible* and what *is*, at the end of the day. The importance of this particular gap is due to the fact that it signifies whether the suppliers believe that they are providing IT services to the best of their abilities. If this particular gap is found to be significant, the actual being lower than the feasible level of IT service, this would indicate that at least in theory, there is a room for improving the service performance of the TSG personnel.

That is, gap 7 should not be significant. Indeed, the TSG personnel should be providing IT services at a level, which is feasible for them. Unfortunately, the statistical test results were not very favourable. Gap 7 was indeed significant overall, and for both of the service dimensions considered in the study.

However, according to the TSG personnel, providing IT services at a level that is feasible is difficult. When asked about the possible reasons behind the existence of gap 7, one participant bluntly stated that this problem is not always due to any special reasons. He simply said:

*"We just don't fulfil customer requests. And no, it is not because of lack of time. Sometimes, the work is simply not done. It's too tedious".*

### **6.12 Conclusion**

As discussed in Chapter 3, the SERVQUAL instrument has received a lot of attention from both managers and researchers as the PM system of service quality. Recently, the concept of service quality and the SERVQUAL instrument have been applied with success in internal services, particularly in the IT service setting; see *Chapter 3.4*.

In this Chapter, the applicability of the conceptual model of internal service quality developed for the current study (see Figure 2.3), and the IT-modified 3-column version of SERVQUAL instrument, was examined. The 3-column format SERVQUAL instrument was applied to measure the 7 gaps identified in the conceptual model in order to determine the service quality of an IT department within Faculty of Commerce and Economics in one of the leading universities in Australia.

The performance of IT services provided by the TSG personnel were measured by the 7 gaps between and within the customers and suppliers regarding the 3 levels of IT service introduced in the conceptual model of IT service quality.

There were 4 major findings to the study:

1. Gaps 1, 2 and 3 were found to be insignificant overall and for the Factor 2 dimension of service. Indeed, there was no difference between the customers and suppliers' perception of ***ideal***, ***acceptable***, and ***actual*** levels of IT service. That is, the communication link between customers

and suppliers was found to be quite sound. The significance observed for Gap 2 in the Factor 1 dimension was due to the TSG personnel having higher acceptable level than the customers did. Furthermore, the popular belief that customers of IT service expect too much was found to be untrue;

2. Gap 4 was found to be significant for all SERVQUAL items under the 2 dimensions of internal service. That is, customers were found to be willing to accept less than their ideal level of IT service, given the limitations due to technology, personnel and other organisational factors;
3. Although the overall and the Factor 1 gap 5 were found to be insignificant at a 95 % level, the Factor 2 dimension concerning the attributes of IT service was considered *unacceptable* by customers;
4. The TSG personnel were found to perceive that their overall actual level of IT service was significantly lower than what they perceive to be acceptable and feasible; Gap 7. Gap 7 was also significant for both service dimensions. Given the insignificance of gap 5 for the overall and Factor 1 dimension measures, the TSG personnel were found to be more critical of their performance than the customers.

## **CHAPTER 7**

### **FINDINGS AND ANALYSIS III**

#### **SERVICE EXPECTATIONS**

*"Information is not a privilege. Its value must be determined by its users." (Paul A. Strassmann, 1985)*

#### **7.1 Introduction**

This Chapter reports the findings to the research question raised in Chapter 3.5 regarding the relative importance of each of the SERVQUAL questions applied in the current study to both customers and suppliers of IT service.

As discussed earlier, the dimensionality of service used in the SERVQUAL instrument has been under a lot of scrutiny; see Chapter 3.3. Indeed, the factor analysis performed in Chapter 5.3 found that there were only 2 service dimensions in the IT service setting used in the current study, supporting the notion that more research is needed before the SERVQUAL instrument can be applied generally in internal services. Less discussed however is the importance of each dimension, relative to other dimensions, to customers and suppliers of IT service. Furthermore, none of the existing studies to date have considered the relative importance of individual SERVQUAL questions under each service dimension to customers and suppliers of service.



The following sections examine the service expectations of the current study's participants, both customers and suppliers of IT service to see whether they have perceived each of the 15 SERVQUAL items analysed to be of equal importance.

## **7.2 Service Expectations**

In the survey used for the current study, participants were asked to select the 5 most important service aspects from the 16 service items considered in the modified version of SERVQUAL questionnaire; see *Appendix 1: Survey Questionnaire - Part C*. As discussed in Chapter 4.5, this exercise was designed to see whether customers and suppliers have the same service expectations, and to see if some of the SERVQUAL questions considered for the study hold more importance than other items to customers and suppliers of IT service. So far, none of the existing SERVQUAL studies have considered the possibility of each SERVQUAL item not being perceived as of equal importance, with Young & Varble (1997) being one exception. However, their study only considered whether one dimension would be perceived more important than others, not the individual questions.

The survey found that neither customers nor suppliers regarded each SERVQUAL item to be of equal importance\*. Also, the service expectation of customers was found to be quite different from that of the suppliers. Furthermore, customers were found to place more importance on Factor 2 service dimension than suppliers, whereas suppliers placed more importance

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\* The Chi-square test significance was 0.000 and 0.031 respectively.

on Factor 1 dimension relative to customers. That is, participants favoured one internal service dimension over the other. Table 7.1 shows the comparison between the expectations of customers and suppliers of IT services against the 2 internal service dimensions.

**Table 7.1: Service Expectations Frequency Table\***

Questions	Customers (selected 1-5)	TSG (selected 1-5)	Higher importance to :
<b>FACTOR 1 - TSG PERSONAL ATTRIBUTES</b>			
<b>TSG personnel....</b>			
Q3 - show sincere interest in solving problems	13 (20%)	1 (11%)	Customers
Q4 - keep appointments	15 (23%)	3 (33%)	TSG
Q8 - are willing to help	20 (31%)	2 (22%)	Customers
Q9 - are trustworthy	11 (17%)	3 (33%)	TSG
Q10 - are courteous	4 (6%)	4 (44%)	TSG
Q11 – have the expertise	45 (70%)	9 (100%)	TSG/Customers
Q12 - are available during business hours	19 (29%)	4 (44%)	TSG
Q14 - provide individual attention	5 (8%)	0 (0%)	Customers
Q15 - have the best interests of users at heart	9 (14%)	2 (22%)	TSG
Q16 - understand specific user problems	23 (35%)	1 (11%)	Customers
<b>FACTOR 2 - IT SERVICE ATTRIBUTES</b>			
Q1 – IT services are received within a reasonable timeframe	48 (73%)	5 (56%)	Customers/TSG
Q2 - IT services are right the first time	34 (52%)	2 (22%)	Customers
Q5 - users are told of the completion date for IT services	21 (32%)	1 (11%)	Customers
Q6 - users are informed about the status of IT services	10 (15%)	6 (67%)	TSG
Q7 - IT services are received promptly	32 (49%)	2 (22%)	Customers

\* Q13 was once again omitted from analysis due to lack of valid responses in the main survey. Furthermore, the selection of Q13 was negligible for both customers and suppliers.

In Table 7.1, the expectations are expressed in terms of the frequency and percentage of participants ranking each question as one of the top 5 most important service aspects. Also, the table shows relative importance of each question to customers or suppliers. Furthermore, the 5 most important service items for customers and for suppliers have been shaded for discussions in later sections.

There were several very interesting findings to this particular section of the survey. From Table 7.1, it can clearly be seen that:

- Neither customers nor suppliers considered the 15 SERVQUAL questions to be of equal importance. In fact, they found only a handful of SERVQUAL questions to be of importance;
- Only 2 questions, ***Q1: Receiving IT services within a reasonable timeframe***, and ***Q11: The expertise of TSG personnel***, were found to hold importance to *both* customers and suppliers;
- From the customers' perspective, 3 out of 5 questions (Q1, Q2 & Q7) from Factor 2 dimension, and 2 out of 10 questions (Q11 & Q16) from Factor 1 dimension were found to be the top 5 important service items. That is, customers considered Factor 2 dimension to be more consequential in determining the quality of IT service; and,
- From the suppliers' perspective, 2 out of 5 questions (Q1 & Q6) from Factor 2 dimension, and 3 out of 10 questions (Q10, Q11 & Q12) from Factor 1 dimension were found to be important. That is, relative to customers, suppliers found Factor 1 dimension to be more significant.

Perhaps, one of the most interesting aspects of the above results is the lack of importance placed by customers on **Q10: The courtesy of TSG personnel**. This was quite evident in the following remark made by one customer:

*"I don't care if they (the TSG personnel) are courteous or not...well, I DO want them to be courteous, but really, solving my IT problems won't depend on their courtesy."*

However, given the selection of Q10 by the TSG personnel as one of the top 5 most important service items, it is evident that there are some misconceptions between customers and suppliers regarding the expectations of IT service.

### **7.3 Conclusion**

This Chapter reported the findings to the research question regarding the relative importance of each of the SERVQUAL questions and service expectations of customers and suppliers. It was found that:

- The 15 SERVQUAL service items held unequal importance to both customers and suppliers;
- The top 5 SERVQUAL questions selected by customers were found to be different from the selections made by suppliers. There was a misconception between customers and suppliers regarding the relative importance of the SERVQUAL service items. That is, their service expectations were different from each other ; and,

- From the customers' perspective, the Factor 2 dimension of IT service was considered more important than the Factor 1 dimension, whereas suppliers considered the Factor 1 dimension to be more important relative to the Factor 2 dimension.

Given the existence of 'misunderstanding' between customers and suppliers regarding the top 5 important service items, further examination of the SERVQUAL questions is needed to determine the service performance of TSG. For further analysis of the SERVQUAL items selected as 'important' by the customer and supplier participants of the study, the following Chapter considers in more detail the 8 SERVQUAL questions, the top 5 service items found to important by customers and/or suppliers (shaded in Table 7.1).

# **CHAPTER 8**

## **FINDINGS AND ANALYSIS IV**

### **MEASUREMENT OF SERVICE PERFORMANCE**

#### **PART 2**

*"High expectations are the key to everything", (Sam Walton)*

#### **8.1 Introduction**

This Chapter considers some of the implications of the findings to the service expectations research question reported in Chapter 7, and re-examines the service performance of TSG by considering only the 8 SERVQUAL questions identified in Chapter 7 as 'important' by customers and suppliers of IT service.

In Chapter 7.2, 8 out of the 15 SERVQUAL questions analysed were selected by customers or suppliers as being the top 5 most important service items, where only 2 questions were selected by *both* customers and suppliers as important. In the following section, the implications of applying the SERVQUAL scales, which are not of equal value, according to the participants in the current study, to measure the performance of TSG are considered. This is then followed by the re-examination of the service performance of TSG by considering individually the 8 questions selected in relation to the 7 gaps identified in the conceptual model developed for the current study.

## **8.2 Implications**

As discussed in Chapter 7, participants of the current study were asked to select the top 5 most important service items out of the SERVQUAL questions used in the study. Out of the 15 SERVQUAL questions analysed, only 2 questions were chosen by both suppliers and customers. Furthermore, customers selected 3 out of 5 questions in Factor 2 dimension, and 2 out of 10 questions in Factor 1 dimension as the top 5 SERVQUAL items. Conversely, out of the top 5 questions selected, suppliers chose 2 from Factor 2 dimension and 3 from Factor 1 dimension. This raises some serious implications regarding the performance of TSG, measured in Chapter 6, using all 15 questions of the SERVQUAL instrument.

From Chapter 6, it was found that while customers did not find the actual level of IT service to be significantly lower than their acceptable level (gap 5) overall, and for Factor 1 service dimension, they did find gap 5 to be significant for Factor 2 service dimension. At first glance, this indicates that customers were generally happy with the performance of TSG; after all, Factor 2 dimension only deals with 5 out of the 15 SERVQUAL questions considered for the study. However, given the above findings regarding the relative importance of each question to customers, further analysis of the performance of TSG is necessary. Furthermore, it was also observed that there was a difference between suppliers and customers regarding the relative importance of the SERVQUAL questions – only 2 questions were

selected by both customers and suppliers as part of the 5 most important questions.

That is, the results from the SERVQUAL measurement of IT service performance in Chapter 6 must now be re-examined. The following sections reconsider the service performance of TSG by individually analysing the 8 service items discussed above.

### **8.3 Question 1**

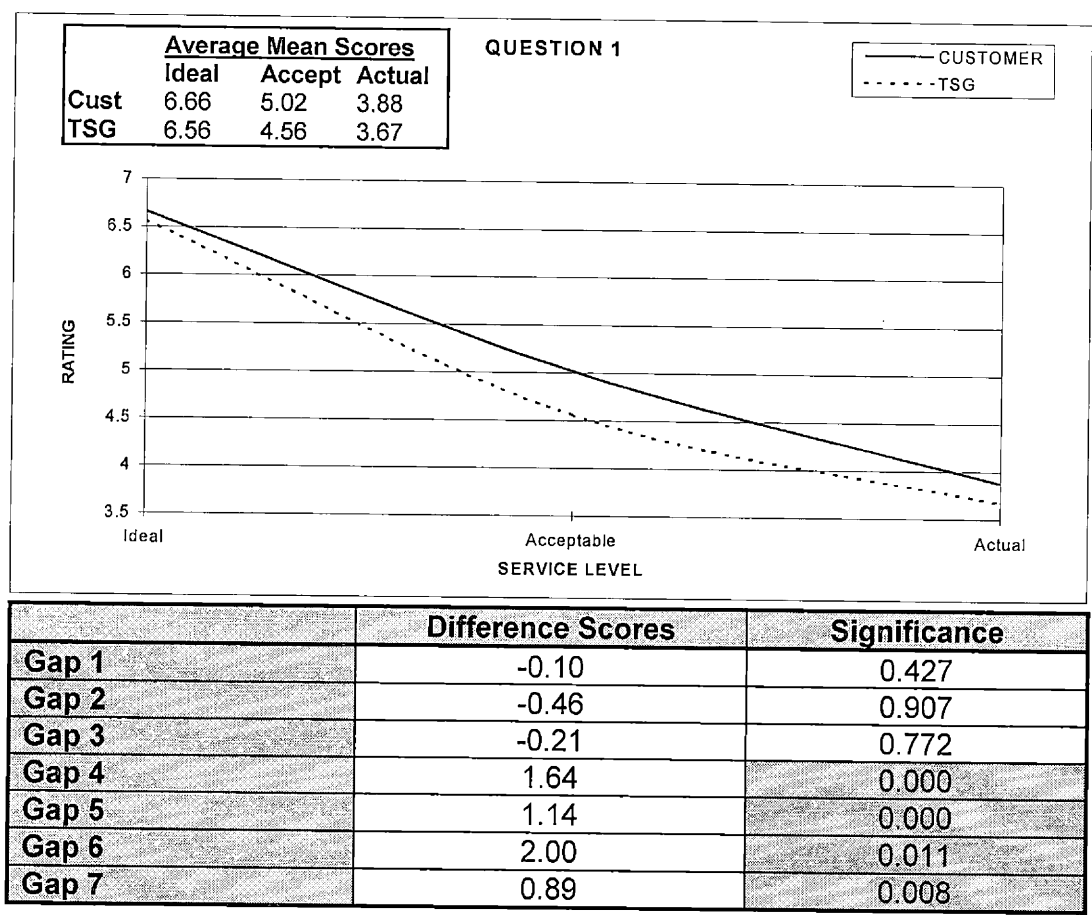
The SERVQUAL question 1 is concerned with receiving or providing requested services within a reasonable timeframe. The majority of both suppliers and customers of TSG indicated that they believe this item to be one of the top 5 most important service requirements. Furthermore, it must also be noted that 73% of the customers selected this service item – by far the most selected item from the customers' perspective; see *Table 7.1*.

The comparison between customers and suppliers' service levels on this particular service item, as well as their actual mean scores and significance, which are shaded, can be seen in Figure 8.1. From Figure 8.1, it can clearly be seen that both suppliers and customers found the difference between acceptable and actual service levels (gaps 5 and 7), to be significant. That is, neither party was happy with the performance of TSG regarding this particular service item. However, it must also be noted that there was no significant difference between customers and suppliers regarding the 3 service level (gaps 1, 2 and 3). Furthermore, while not statistically significant, it was the



customers who indicated higher average mean scores for all three levels – a departure from the findings in Chapter 7.

**Figure 8.1: Question 1 Comparison of Customer/Supplier Service Levels**

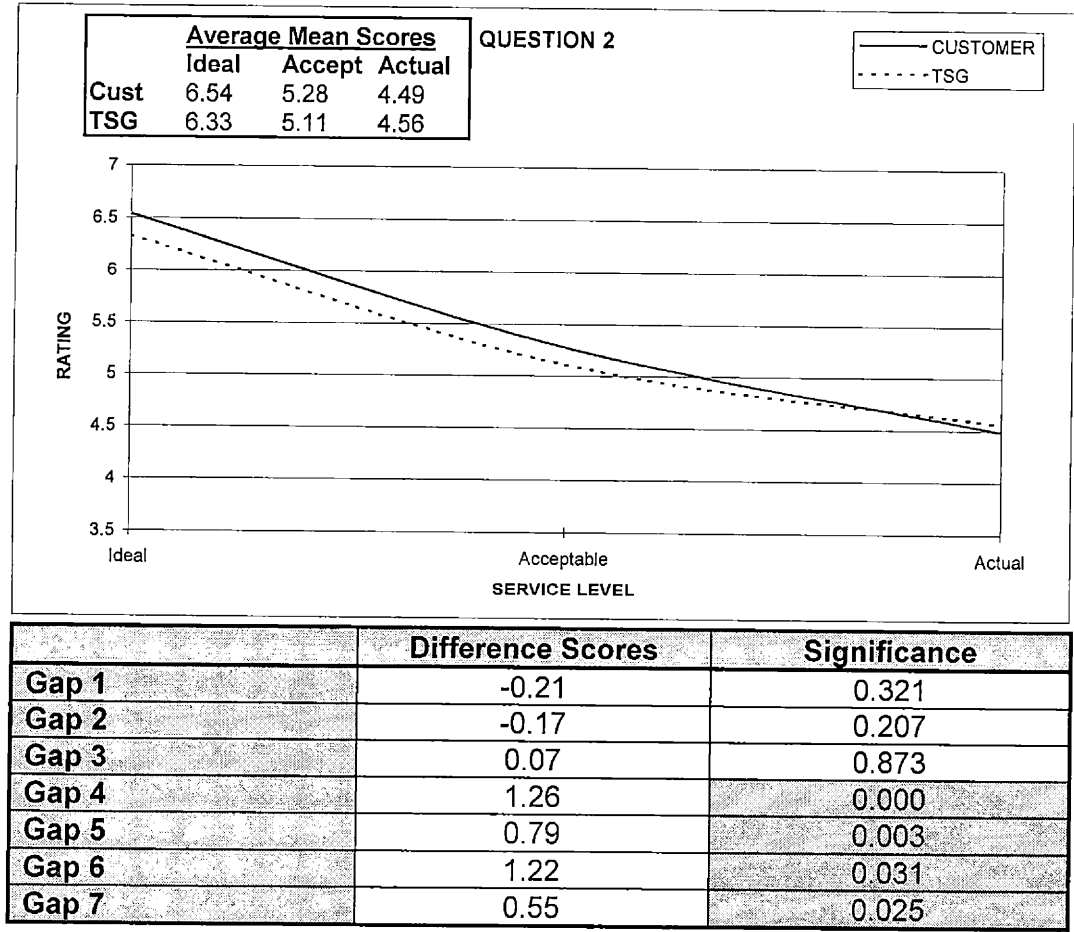


Thus, according to the SERVQUAL question 1, the performance of TSG was less than acceptable to customers, as well as to suppliers. However, there was no significant difference between customers and suppliers' expectation and perception of the 3 IT service levels.

8.4 Question 2

The SERVQUAL question 2 is concerned with receiving or providing IT services right the first time. That is, this particular service item is designed to measure the perception of customers and suppliers regarding the correct provision of IT service the first time. Interestingly enough, this particular question was selected only by customers (52%); see Table 7.1. Figure 8.2 shows the comparison between customers and suppliers' service levels and the significance of their gaps.

Figure 8.2: Question 2 Comparison of Customer/Supplier Service Levels



From Figure 8.2, it can be seen that clearly, there was no notable gap between the 3 levels of IT service between customers and suppliers (gaps 1

to 3). That is, customers considered that the acceptable level of service to be significantly lower than the ideal level (gap 4) and the actual level of service to be significantly less than what is acceptable (gap 5). This was also true from the suppliers' perspective.

However, it is worth noting that while statistically insignificant, customers' perception of the actual service level was lower than the suppliers'. This raises some concern given that it was the customers who considered this particular service item to be of importance.

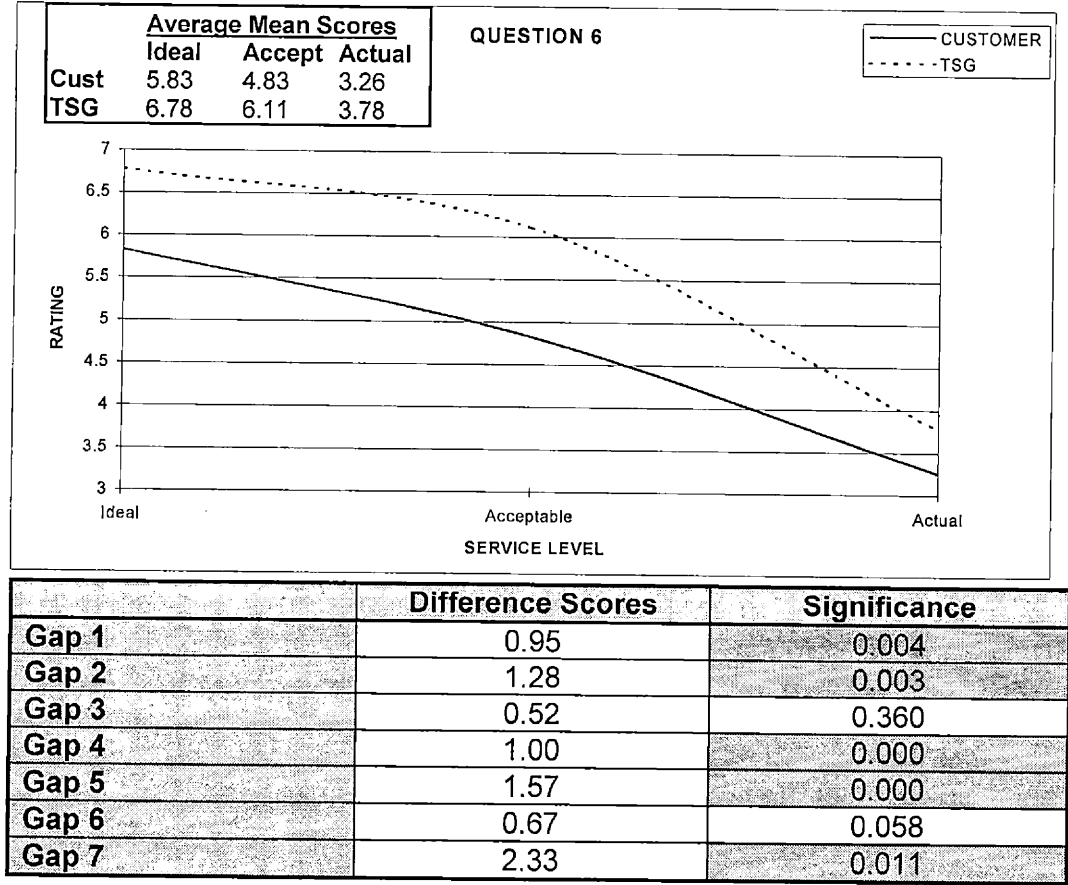
In summary, according to the SERVQUAL question 2, which was considered important by customers only, the performance of TSG was once again less than acceptable to customers. While suppliers also considered the actual level of their service to be significantly less than what is acceptable, the majority of suppliers did not consider this item to be of importance. That is, there clearly was a misunderstanding between customers and suppliers regarding its importance.

### **8.5 Question 6**

The SERVQUAL question 6 is concerned with customers being informed regularly about the status of their request. Only suppliers selected this particular question as important; see *Table 7.1*. Indeed, only 15% of the customers selected this service item while the majority (67%) of the suppliers considered it to be of importance. The comparison between customers and suppliers is depicted in *Figure 8.3*.

Figure 8.3 depicts rather an interesting comparison between customers and suppliers' levels of IT service, which is very different from the previous service questions 1 and 2. Firstly, gaps 1 and 2 were found to be quite significant, which shows that the suppliers' ideal and acceptable levels of IT service is notably higher than that of the customers'. Furthermore, suppliers were found to accept that they should provide services at a level not significantly less than the ideal level – gap 6 was insignificant.

**Figure 8.3: Question 6 Comparison of Customer/Supplier Service Levels**



Secondly, despite the high expectations set by suppliers for the ideal and acceptable service levels, there was a significant drop from the acceptable to

the actual level of IT service (gap 7). From the suppliers' perspective, this is quite a problem given that the majority of suppliers considered this particular SERVQUAL item to be of importance. This can be contrasted with the customers' perspective. While customers did find the actual level to be significantly lower than their acceptable level, they simply did not consider this particular service item to be of much concern.

In summary, there seems to be a huge misconception about the SERVQUAL item 6 from the suppliers' perspective regarding the ideal and acceptable levels of IT service. While it was found that suppliers perceived the task of informing customers about the status of their requests is one of the most important aspect of their service provision, customers did not agree with the suppliers' perception. That is, although customers perceived the actual level of service to be significantly less than acceptable (gap 5), they simply did not place enough emphasis on this particular item.

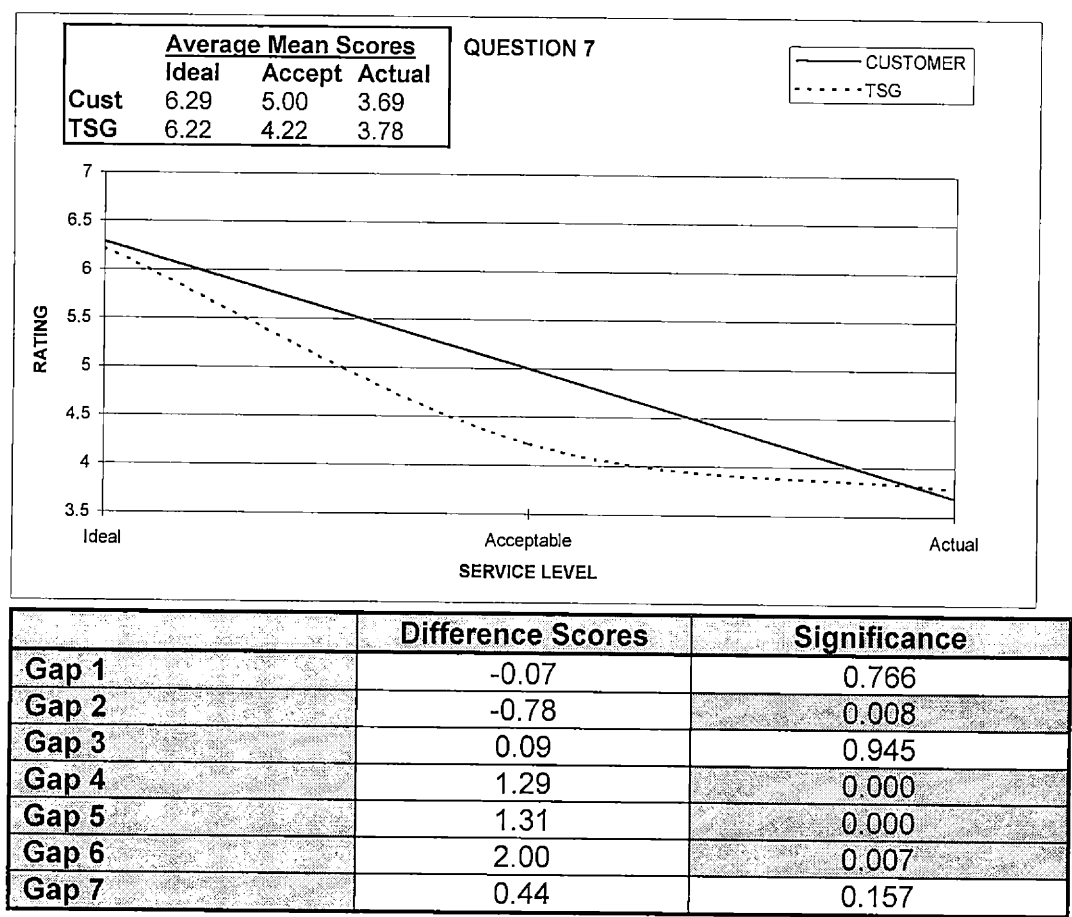
### **8.6 Question 7**

The SERVQUAL question 7 is concerned with receiving or providing prompt services without delays. From Table 7.1, it can be seen that only customers (49%) selected this service item as important. The comparison between customers and suppliers' service levels regarding this particular item is quite interesting, which is quite clearly shown in Figure 8.4.

One of the most interesting findings regarding the SERVQUAL question 7 is the comparison between customers and suppliers' acceptable level of service

(gap 2). While there was no significant difference between their ideal levels of service (gap 1), the graph clearly shows that gap 2 was significant. This particular significance is quite alarming, especially given the fact that it was selected only by customers as important.

**Figure 8.4: Question 7 Comparison of Customer/Supplier Service Levels**



That is, the acceptable level of IT service from the customers' perspective regarding this particular aspect of service was significantly higher than that of the TSG personnel. Furthermore, while customers perceived the actual level of service to be significantly less than acceptable (gap 5), it was found that the suppliers' perception of the actual level of service was not significantly different from the acceptable level (gap 7). That is, while customers found the

actual level to be unacceptable, suppliers believed that what they were actually providing was at a level which is feasible and thus, acceptable.

This is quite a serious problem from the management's perspective, especially given the fact that this particular service item was found to have more importance to customers than to suppliers. As a result, the service provision of the TSG regarding the SERVQUAL item 7 was not only less than acceptable to customers, it was also found that there was a significant misconception between customers and suppliers regarding just what is acceptable.

### **8.7 Question 10**

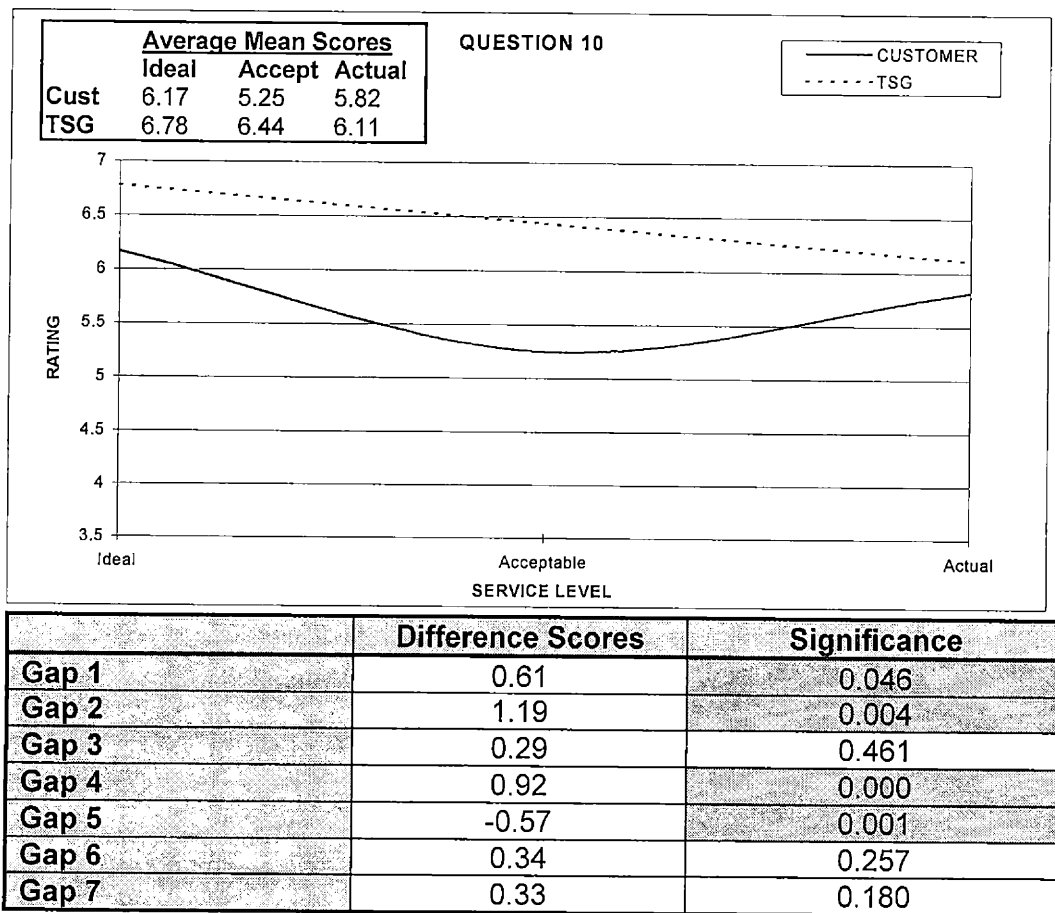
The SERVQUAL question 10 considers the courtesy of the TSG personnel. As discussed in Chapter 7.2, this particular SERVQUAL question produced one of the most interesting results. While the TSG personnel selected question 10 as important, it was found that the customers of TSG services did not share this opinion. Astonishingly enough, only 4 out of 65 customer participants (6%) considered this service aspect as the top 5 important items, whereas 44% of the TSG personnel considered it as important; *see Table 7.1*. The implications of this apparent misunderstanding between customers and suppliers can be shown clearly in Figure 8.5.

The average means scores in Figure 8.5 shows that the ideal service level for this particular SERVQUAL question from the TSG personnel is very high. Gap 1, the difference between the customers and suppliers regarding the

ideal level is statistically significant. That is, customers simply did not expect too much regarding this particular service item, nor did they consider it to be important.

Furthermore, the customers' acceptable level for question 10 was found to be significantly less than their ideal level, and significantly less than that of the suppliers' acceptable level. That is, gap 2 was also found to be significant.

**Figure 8.5: Question 10 Comparison of Customer/Supplier Service Levels**



It is also interesting to note that while there was no significant difference between customers and suppliers' actual level of service, customers perceived the actual level of service to be significantly "higher" than their



acceptable level. That is, gap 5 was significant the 'other way'. This was the only SERVQUAL question with gap 5 significant due to the actual level being higher than the acceptable level; see *Appendix 3*.

This is particularly interesting given the lack of significance for gaps 6 and 7. That is, the TSG personnel perceive that question 10 is important, and this particular aspect of service can be provided at a level statistically no different from the ideal level, and the actual level of service is being provided at the acceptable level. That is, they are doing a 'fine' job, and furthermore, customers were found to agree with the TSG personnel – in fact, the actual level of service was considered "beyond acceptable". Unfortunately, given the fact that customers did not consider this particular aspect of service to be important, the TSG personnel were simply spending too much effort providing this particular aspect of IT service unnecessarily.

### **8.8 Question 11**

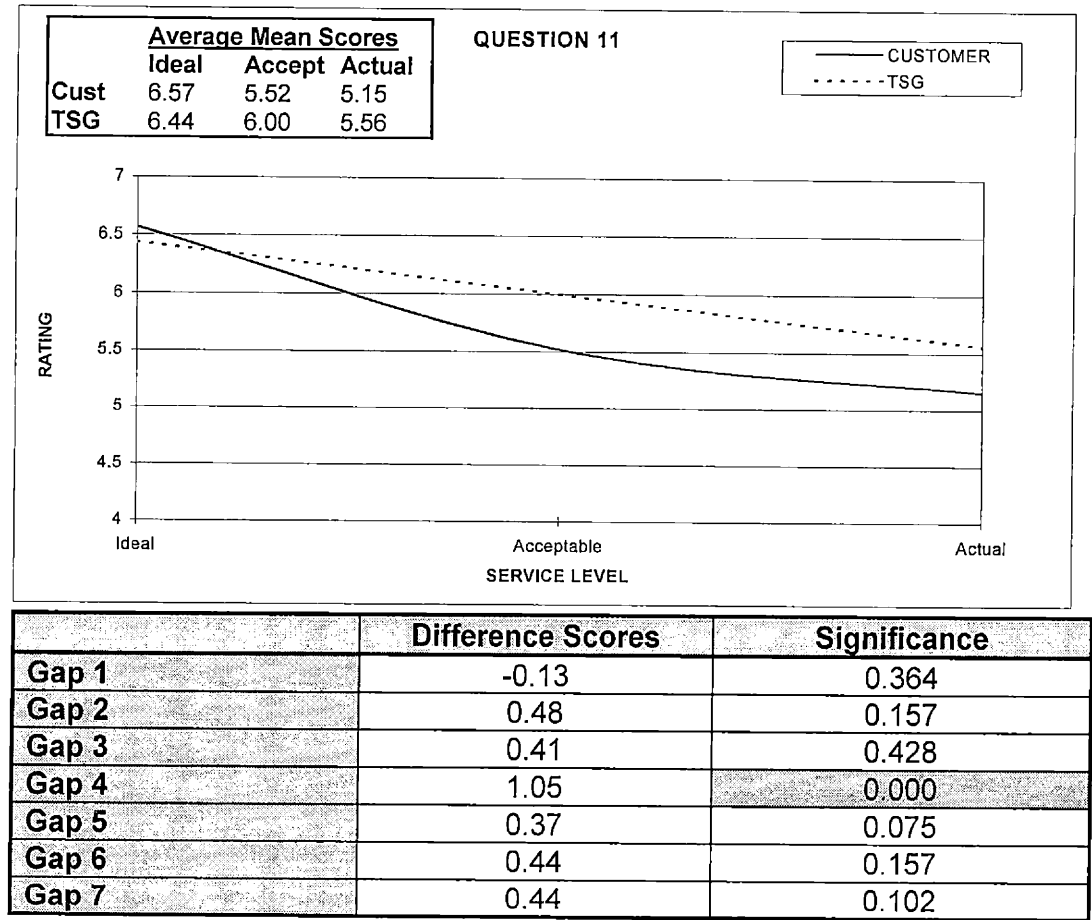
The SERVQUAL question 11 considers the level of expertise of the TSG personnel. This particular service item is from the service dimension Factor 1, which deals with the personal attributes of suppliers, and was selected as important by the large majority of both customers (70%) and suppliers (100%); see *Table 7.1*. Indeed, it is worth noting that this particular service item 11 was chosen by 100% of the suppliers.

The comparison between customers and suppliers' levels of service produced several very intriguing findings, which are shown in Figure 8.6. Firstly, there

was no significant difference between the 3 levels of service between customers and suppliers (gaps 1, 2 and 3). Secondly, while customers were once again willing to accept a level of service significantly less than the ideal (gap 4), suppliers did not share the same notion. From the suppliers' perspective, they perceived the acceptable level to be not significantly different from the ideal level (gap 6).

Furthermore, neither customers nor suppliers perceived the actual level of service to be significantly less than the acceptable level. That is, both parties were quite happy with the actual level of service in regards to this particular service provision.

**Figure 8.6: Question 11 Comparison of Customer/Supplier Service Levels**



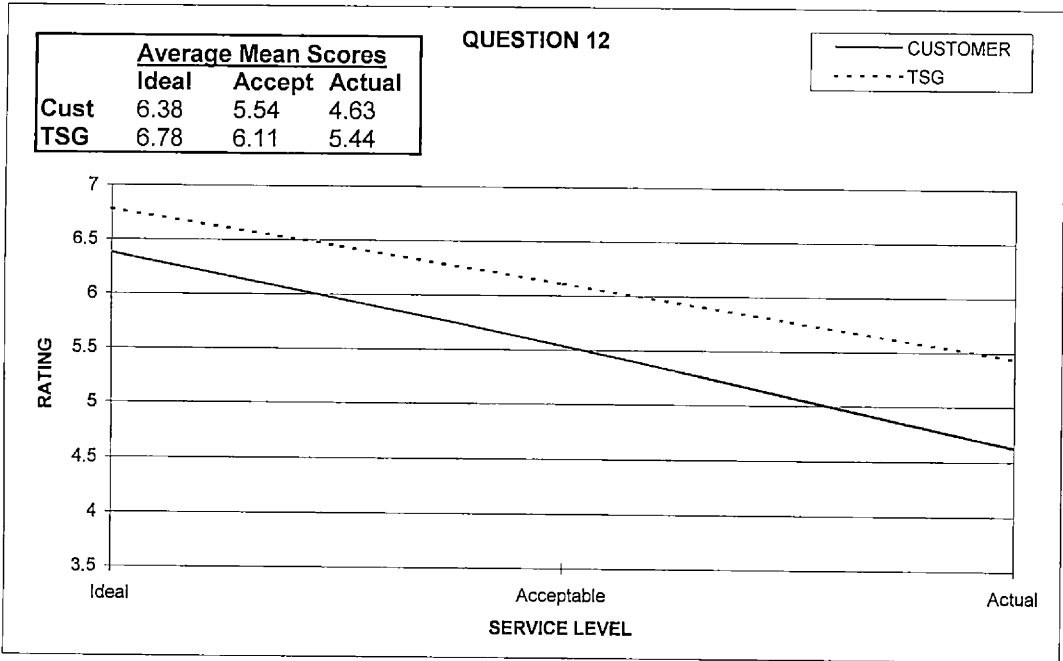
Given the importance of this particular service item to both customers and suppliers, this result is quite encouraging. However, while there was no statistically significant gap for the actual level between customers and suppliers, it must be pointed out that the average mean score for the suppliers' actual level was higher than that of the customers'. This particular element must be monitored carefully in order to ensure that this gap does not become too wide.

### **8.9 Question 12**

The SERVQUAL question 12 considers the availability of the TSG personnel during business hours (9:00 to 5:00), and was selected only by the TSG personnel as important (44%); see *Table 7.1*. However, it must be considered that from the customers' perspective, this particular aspect of service is so 'obvious' that they simply may not have considered the need to acknowledge its importance. Figure 8.7 shows that this particular question could become a problem.

Once again, the TSG personnel were found to have higher average means scores for all three levels of IT service. While gaps 1, 2, and 3 were found to be insignificant, both the TSG personnel and customers considered the actual level of service to be unacceptable. Although customers did not select this question to be important, it must be noted that the management should keep a keen eye on this particular aspect of service.

**Figure 8.7: Question 12 Comparison of Customer/Supplier Service Levels**

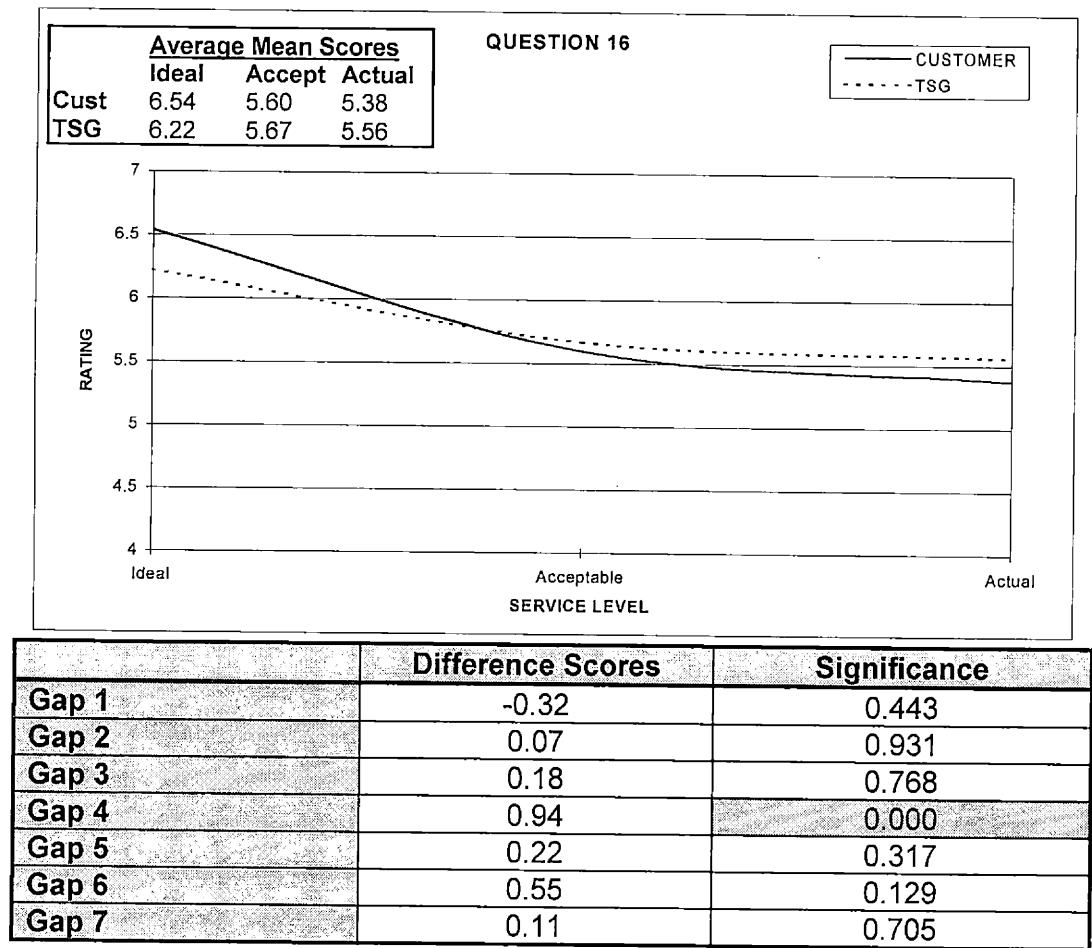


	Difference Scores	Significance
Gap 1	0.40	0.167
Gap 2	0.57	0.245
Gap 3	0.81	0.114
Gap 4	0.84	0.000
Gap 5	0.91	0.000
Gap 6	0.67	0.034
Gap 7	0.67	0.034

**8.10 Question 16**

The SERVQUAL question 16 is concerned with the TSG personnel understanding specific problems of customers. This particular question was selected by 23 out of 65 customers (35%) as important while only 1 TSG personnel considered this item to be the top 5 important aspects of IT service. This notable difference between the expectations of customers and suppliers dictates that this particular question must be considered carefully. Figure 8.8 shows the comparison between customers and suppliers regarding the 3 levels of IT service.

**Figure 8.8: Question 16 Comparison of Customer/Supplier Service Levels**



From Figure 8.8, it is quite surprising to see that there was no statistical difference between the 3 levels of IT service from customers and suppliers' perspectives (gaps 1, 2, and 3). However, it is worth noting that the average score for the ideal level of the customers was higher than the TSG personnel, given that it was the customers who selected this particular question to be of importance. That is, the management should keep a keen eye on this particular aspect of service.

### **8.11 Conclusion**

The service expectation research question in Chapter 7 found that the participants of the study, both customers and suppliers of IT service did not consider the 15 SERVQUAL service items to be of equal value. Indeed, it was found that only 2 out of the 15 SERVQUAL questions analysed were selected by both customers and suppliers as important.

In this Chapter, the implications rising from the differing expectations of service on the performance measurement of TSG conducted in Chapter 6 were examined. Despite the findings in Chapter 6 which indicated that there is no misunderstanding between customers and suppliers regarding the 3 levels of IT service, the individual examination of the 8 SERVQUAL questions, which were selected by customers and by suppliers as the top 5 important service aspects, found that there were some aspects of IT service which caused misconception between the two parties. That is, for better diagnostic value, it is essential to consider each of the SERVQUAL items separately.

The re-examination of the service performance of TSG found several very interesting findings:

- Question 6, which was selected only by suppliers as important, had significant gaps 1 and 2. The TSG personnel were found to have significantly higher ideal and acceptable level of IT service than the customers;
- Question 10, selected only by suppliers as important, had once again significant gaps 1 and 2, with the TSG personnel having higher scores for

the ideal and acceptable levels of service. Furthermore, gap 5 was also found to be significant, but with the actual level of IT service being higher than the acceptable level. That is, from the customers' perspective, they considered the actual level of this particular aspect of service to be better than what is acceptable. However, given that only 4 out of the 65 customer participants selected this question as one of the top 5 most important SERVQUAL items, this 'better than acceptable' level of service was perhaps unnecessary from the TSG personnel's perspective; and,

- There was no misunderstanding between customers and suppliers regarding Question 1 and 11, which were selected by both customers and suppliers – gaps 1, 2, and 3 were insignificant.

## **CHAPTER 9**

### **CONCLUSION**

*"In the long run, the single most important factor affecting a business unit's performance is the quality of its products and services", (Buzzell & Gale, 1987)*

#### **9.1 Summary of the Findings**

The current study was motivated by the recent interest in internal service management, which includes managing employees who alternatively act as customers and suppliers of internal services and measuring the performance of internal services. Internal service functions such as information technology (IT) provisions have recently gained a lot of interest due to the ever-growing size of their expenditures. As a result, measuring the performance of internal functions has become one of the most critical aspects of organisational control.

In this study, a new conceptual model of internal service quality was developed based on the "gaps" models of PZB (1985), and Watson *et al.* (1993). Furthermore, a new PM system of internal service quality, the modified 3-column format version of the original SERVQUAL instrument introduced in PZB (1988), was developed and tested for its applicability in internal services. The new PM system was then applied to the IT service setting to measure the service performance of an IT department, the TSG, in one of the largest universities in Australia.



The major findings of this study were:

- The concept of service quality and the SERVQUAL instrument can be applied in internal services settings with some modifications;
- There was no difference between the difference-score measures and the actual (perception only) measures in the IT service setting used in the current study;
- There was, however, a significant difference between the dimensions of service identified in the original SERVQUAL instrument and the dimensions of service identified in the current study. The 5 service dimensions identified by PZB in their external service quality studies were found to be inapplicable in the current study's internal service setting. Indeed, according to the factor analysis conducted, there were only 2 distinct service dimensions in the IT service provision of the current study;
- The relative importance of each of the SERVQUAL questions was found to be different for customers and suppliers. Customers were found to place more importance on the **Factor 2: IT Service Attribute** dimension relative to suppliers, whereas the **Factor 1: TSG Personal Attribute** dimension was found to have higher importance to suppliers. Furthermore, only 2 service items, question 1 and 11 were selected by both customers and suppliers as being important; and,
- Given the difference between customers and suppliers regarding the relative importance of each of the SERVQUAL questions, it is imperative that the individual service aspects considered by the SERVQUAL instrument be examined separately. Furthermore, for the purpose of better

diagonostical value, the 3-column format SERVQUAL designed to measure all 7 gaps of the conceptual model of service quality, is recommended.

## ***9.2 Limitations of the Study***

As with any study, there are several limitations associated with the current study. The first limitation arises from the sample selection procedure and the sample size of the study. Due to the timing of the survey, which was during the end-of-session and the Christmas break, only the available staff members of the Faculty were able to participate in the study. That is, the selection of participants purely depended on the availability of participants. The sample was not randomly chosen, nor was it according to a specific, measured selection method. Furthermore, the sample size used in the study was also severely affected due to the lack of available staff members. Indeed, the difficulty was with getting comparable number of participants from each schools and departments.

Furthermore, there were only 9 participants for the 'internal suppliers' side of the conceptual model. However, it must be pointed out that they were the entire staff of the TSG department – it is not atypical for an 'internal' department to have less than a dozen staff members.

The second limitation of the study is due to the exploratory nature of the survey questionnaire and the data collection method used. Despite the self-administrative quality of the SERVQUAL questionnaire, there has been some concern regarding the format of the questionnaire. While the modification

made to the SERVQUAL questionnaire were not extreme enough to affect the test-retest statistics, there were some 'yips' to the questionnaire which were picked up by several participants whose questionnaires were collected during knock-on-the-door phase. The participants who returned their questionnaires via internal mail system did not have the opportunity to query possible problems.

The final limitation is related to the generalisability of the current study's findings. Given the notable differences between external and internal service settings discovered in the study, it is difficult to state that the conceptual model and the PM system developed for IT service quality will hold in all internal service settings. That is, more empirical research is needed in the area of internal services to test the generalisability of the model and the PM system.

### ***9.3 Future Research Areas***

The current study supported the notion that while the concept of service quality and the SERVQUAL instrument can be applied in an IT service setting, there are differences between the external and internal service settings. Future research can further examine the SERVQUAL questionnaire in internal service settings and question its generalisability by carrying out more empirical research in different internal service settings. That is, given the current study's university setting, will the organisational settings yield different results? Also, can SERVQUAL measures be used to benchmark departmental performance of an organisation?

Also, more focus must be placed on the dimensionality and each service item of the SERVQUAL questionnaire. So far, no other empirical studies have examined the impact of having service dimensions and items, which are not considered of equal importance, on the 'gaps' measurements. Indeed, given the current study's findings regarding the customers' tendency towards the Factor 2 dimension and the opposite tendency demonstrated from the suppliers, what should be done to compute the final measures of performance? Should the service expectations of customers and suppliers be considered prospectively or retrospectively?

Another potential research area is the cultural effect on SERVQUAL scales. Kettinger et al. (1995) found that the feasibility of standardised global quality measures depends heavily on the relative magnitude of cultural effects. That is, the use of SERVQUAL as the universal scale in other countries, since it was predominantly developed in the US, must be questioned.

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## **APPENDIX 1A**

**CONFIDENTIAL**  
**QUESTIONNAIRE FOR USERS (CUSTOMERS) OF**  
**TSG SERVICES**

Dear \_\_\_\_\_

Thank you very much for your support for my masters research on the Performance Measurement of Services offered by the **Technology Support Group (TSG)** in the Faculty of Commerce and Economics.

The **TSG** comprises of technically qualified staff who manage, co-ordinate and support the demands within the Faculty for computer support and related functions. The group is also responsible for recommending and implementing strategic technology solution to individual members of the Faculty. A range of services offered by TSG is listed on the next page.

I have attached a questionnaire for you to kindly complete. The instructions to the questionnaire are on the next page. Please follow the directions and complete all three parts of the questionnaire.

**Please be assured that your responses will be treated with the strictest confidence.** Responses will be coded for the research and accessed only by myself.

Thank you very much for your participation in this study.

Regards,  
Helen Kang  
School of Accounting

## DIRECTIONS

The study addresses issues regarding the measurement of TSG's service performance using three different levels of service quality; *Ideal*, *Acceptable* and *Actual*.

Please consider the following terms used in the questionnaire.

- **TSG** - Technology Support Group in the Faculty of Commerce and Economics.
- **TSG Services** - a range of services offered by TSG including;
  - management of staff inquiries including follow-up of requests
  - computer technical support including hardware/software repairs
  - routine checks of Faculty supported computer laboratories
  - virus prevention and removal
  - installation of hardware, operating systems, applications and peripherals for staff and laboratory environments
  - technical support for administration, teaching and research
  - general customer assistance
- **TSG personnel** - any representative of TSG
- **Ideal level of IS service** - the level of service you *would like* to receive from TSG
- **Acceptable level of IS service** - the minimum level of service you are *willing* to accept from TSG (given that there are constraints on the budget, personnel and technology available to TSG)
- **Actual level of IS service** - the actual level of service you ultimately receive from TSG.

Your participation in this study will be greatly appreciated. Please complete all three parts in the questionnaire. Again, be assured that your responses will be treated with strictest confidence.

PART A: PROFILE

CONFIDENTIAL

1. School/Department : \_\_\_\_\_
2. Position (e.g. professor) : \_\_\_\_\_
3. Number of years in the Faculty : \_\_\_\_\_

4. Age group
- under 25

25 to 35

35 to 45

over 45
- ☐

☐

☐

☐

5. How often do you request services from TSG?

- Never ☐
- Once or twice a year ☐
- Once every quarter ☐
- Once every month ☐
- More than once every month ☐
- Once every week ☐
- More than once every week ☐

*Please go to question 6*

*Please go to question 7  
on the next page*

6. If never, why? : \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

*You do not need to complete the rest of the questionnaire. Thank you very much for your participation. Please return the questionnaire to:*

**Helen Kang**  
**School of Accounting**  
**Faculty of Commerce and Economics**

**7. What TSG services do you use?**

*(Please tick more than 1 box if you wish)*

Repairs (e.g. hardware/software repairs)

Computer Laboratory assistance

Virus prevention and removal

Installation of hardware & operating systems

Technical support for administration, teaching and research

General customer assistance (e.g. any computer related inquiries)


***Please continue to Part B***



## PART B: TSG SERVICE QUALITY MEASUREMENTS

(For each question, please circle an appropriate number of your choice)

QUESTIONS		IDEAL LEVEL OF SERVICE	ACCEPTABLE LEVEL OF SERVICE	ACTUAL LEVEL OF SERVICE
	When it comes to.....	What is the level of service you <u>would like</u> to receive?	What is the <u>minimum level</u> of service you are <u>willing to</u> accept?	What is your perception of the <u>actual level</u> of service you ultimately receive?
1	Receiving requested services within a reasonable time-frame	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
2	Receiving requested services right the first time	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
3	TSG personnel showing a sincere interest in solving your problems	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
4	TSG personnel keeping their appointments; e.g. for meetings	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
5	Being informed about exactly when the request can be completed	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
6	Being informed regularly about the status of your requests	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7

QUESTIONS		IDEAL LEVEL OF SERVICE							ACCEPTABLE LEVEL OF SERVICE							ACTUAL LEVEL OF SERVICE								
	When it comes to.....	What is the level of service you <u>would like</u> to receive?							What is the <u>minimum level</u> of service you are <u>willing to</u> accept?							What is your perception of the <u>actual level</u> of service you ultimately receive?								
7	Receiving prompt services without delays	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
8	TSG personnel's willingness to help you	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
9	The trustworthiness of TSG personnel	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
10	The courtesy of TSG personnel	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
11	The level of expertise of TSG personnel	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
12	The availability of services during business hours	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
13	The availability of services after business hours (5:00 - 9:00 pm weekdays)	low						high	low							high	low							high
		1	2	3	4	5	6	7	1	2	3	4	5	6	7		1	2	3	4	5	6	7	
																								N/A

QUESTIONS		IDEAL LEVEL OF SERVICE	ACCEPTABLE LEVEL OF SERVICE	ACTUAL LEVEL OF SERVICE
	When it comes to.....	What is the level of service you <u>would like</u> to receive?	What is the <u>minimum level</u> of service you are <u>willing to</u> accept?	What is your perception of the <u>actual level</u> of service you ultimately receive?
14	Receiving person-to-person, individual attention from TSG personnel	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
15	TSG personnel having your best interests at heart	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
16	TSG personnel understanding your specific requests	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7

*Please continue to Part C*

**PART C: EXPECTATIONS**

Please select the 5 most important items from the following, and rank them from 1 to 5, with your perception of importance, 1 being the most important.

- Receiving requested services within a reasonable timeframe ☐
- Receiving requested services right the first time ☐
- TSG personnel keeping their appointments ☐
- Receiving prompt services without delays ☐
- TSG personnel's willingness to help you ☐
- Trustworthiness of TSG personnel ☐
- Courtesy of TSG personnel ☐
- Level of expertise of TSG personnel ☐
- Receiving person-to-person attention from TSG personnel ☐
- TSG personnel having your best interests at heart ☐
- TSG personnel understanding your specific requests ☐
- TSG personnel showing a sincere interest in solving your problems ☐
- Being informed about exactly when the request can be completed ☐
- Being informed regularly about the status of your request ☐
- The availability of services during business hours ☐
- The availability of services after business hours (5:00 - 9:00 pm) ☐

***Thank you very much for your participation. Please return the questionnaire to:***

**Helen Kang**  
**School of Accounting**  
**Faculty of Commerce and Economics**

## **APPENDIX 1B**

**CONFIDENTIAL**  
**QUESTIONNAIRE FOR PROVIDERS OF**  
**TSG SERVICES**

Dear \_\_\_\_\_

Thank you very much for supporting my masters research on the Performance Measurement of Internal Services offered by the **Technology Support Group (TSG)** in the Faculty of Commerce and Economics.

The TSG comprises of technically qualified staff who manage, co-ordinate and support the demands within the Faculty for computer support and related functions. The group is also responsible for recommending and implementing strategic technology solution to individual members of the Faculty. A range of services offered by TSG is listed on the next page.

I have attached a questionnaire for you to kindly complete. The instructions to the questionnaire are on the next page. Please follow the directions and complete all parts of the questionnaire.

**Please be assured that your responses will be treated with the strictest confidence.** Responses will be coded for the research and accessed only by myself.

Thank you very much for your participation in this study.

Regards,  
Helen Kang  
School of Accounting

## DIRECTIONS

The study addresses issues regarding the measurement of TSG's service performance using three different levels of service quality; *Ideal*, *Acceptable* and *Actual*.

Please consider the following terms used in the questionnaire.

- **TSG** - Technology Support Group in the Faculty of Commerce and Economics.
- **TSG Services** - a range of services offered by TSG, including;
  - management of staff inquiries including follow-up of requests
  - computer technical support including hardware/software repairs
  - routine checks of Faculty supported computer laboratories
  - virus prevention and removal
  - installation of hardware, operating systems, applications and peripherals for staff and laboratory environments
  - technical support for administration, teaching and research
  - general customer assistance
- **TSG personnel** - any representative of TSG
- **Ideal level of IS service** - the level of service you ***should*** provide to meet user expectations and requirements
- **Acceptable level of IS service** - the minimum level of service you ***can*** provide (given that there are constraints on the budget, personnel and technology available to TSG)
- **Actual level of IS service** - the actual level of service you ultimately provide

Your participation in this study will be greatly appreciated. Please complete all three parts of the questionnaire. Again, be assured that your responses will be treated with strictest confidence.

PART A : PROFILE

CONFIDENTIAL

1. Department (e.g. TSG) :
2. Position :
3. Number of years in the Faculty :

4. Age group
- under 25

25 to 35

35 to 45

over 45
- ☐

☐

☐

☐

5. How often do you provide IS services to members of the Faculty?
- Never

Once or twice a year

Once every quarter

Once every month

More than once every month

Once every week

More than once every week
- ☐

☐

☐

☐

☐

☐

☐
- 
- Please go to question 6

Please go to question 7

on the next page

6. If never, why? :
- 
- 
- 
- 
- 

You do not need to complete the rest of the questionnaire. Thank you very much for your participation. Please return the questionnaire to:

Helen Kang  
School of Accounting  
Faculty of Commerce and Economics



**7. What TSG services do you provide ?**

*(Please tick more than 1 box if you wish)*

Repairs (e.g. hardware/software repairs )

Computer Laboratory assistance

Virus prevention and removal

Installation of hardware & operating systems

Technical support for administration, teaching and research

General customer assistance (e.g. any computer related inquiries )


***Please continue to Part B***

## PART B : TSG SERVICE QUALITY MEASUREMENTS

(For each question, please circle an appropriate number of your choice)

QUESTIONS		IDEAL LEVEL OF SERVICE	FEASIBLE LEVEL OF SERVICE	ACTUAL LEVEL OF SERVICE
	When it comes to.....	What is the level of service you <u>should</u> provide to meet user requirements?	What is the maximum level of service you <u>can</u> provide given the limitations of technology, time and budget?	What is your perception of the <u>actual level</u> of service you ultimately provide?
1	Providing requested services within a reasonable time-frame	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
2	Providing requested services right the first time	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
3	Showing a sincere interest in solving user problems	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
4	Keeping appointments with users; e.g. for meetings	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
5	Informing users when the request can be completed	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
6	Informing users regularly about the status of their requests	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7

QUESTIONS		IDEAL LEVEL OF SERVICE	FEASIBLE LEVEL OF SERVICE	ACTUAL LEVEL OF SERVICE
	When it comes to.....	What is the level of service you <u>should</u> provide to meet user requirements?	What is the maximum level of service you <u>can</u> provide given the limitations of technology, time and budget?	What is your perception of the <u>actual level</u> of service you ultimately provide?
7	Providing prompt services without delays	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
8	Willingness to help users	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
9	The trustworthiness of TSG personnel	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
10	The courtesy of TSG personnel	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
11	The level of expertise of TSG personnel	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
12	The availability of services during business hours	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
13	The availability of services after business hours (5:00 - 9:00 pm weekdays)	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7

QUESTIONS		IDEAL LEVEL OF SERVICE	FEASIBLE LEVEL OF SERVICE	ACTUAL LEVEL OF SERVICE
	When it comes to.....	What is the level of service you <u>should</u> provide to meet user requirements?	What is the maximum level of service you <u>can</u> provide given the limitations of technology, time and budget?	What is your perception of the <u>actual level</u> of service you ultimately provide?
14	Providing person-to-person, individual attention to users	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
15	Having the best interests of users at heart	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7
16	Understanding specific requests of users	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7	low high 1 2 3 4 5 6 7

**PART C : EXPECTATIONS**

Please select the 5 most important items from the following, and rank them from 1 to 5 with your perception of the importance, 1 being the most important.

- Providing requested services within a reasonable timeframe ☐
- Providing requested services right the first time ☐
- Keeping appointments with users ☐
- Providing prompt services without delays ☐
- Willingness to help users ☐
- Trustworthiness of TSG personnel ☐
- Courtesy of TSG personnel ☐
- Level of expertise of TSG personnel ☐
- Providing person-to-person attention to users ☐
- Having users' best interests at heart ☐
- Understanding users' specific requests ☐
- Showing a sincere interest in solving user problems ☐
- Informing users about when the request can be completed ☐
- Informing users regularly about the status of their request ☐
- The availability of services during business hours ☐
- The availability of services after business hours (5:00 – 9:00pm) ☐

***Thank you very much for your participation. Please return the questionnaire to:***

**Helen Kang**  
**School of Accounting**  
**Faculty of Commerce and Economics**

## **APPENDIX 2**

**ATTN: FACULTY OF COMMERCE AND ECONOMICS**  
**re: Masters Research Project**

Dear Staff Member.

Over the next few weeks, Helen Kang, a postgraduate student from the School of Accounting, will be knocking on your door asking for your participation with her Masters research. It will consist of completing a questionnaire, and in some cases, a short interview. The total participation time is likely to last from 5 to 15 minutes.

The research is based on the performance measurement of Technology Support Group (TSG) in the Faculty of Commerce and Economics using three different levels of service quality.

It would be greatly appreciated if you could spare 5 to 15 minutes for Helen. If there is any question regarding the Research or if you would like Helen to make an appointment, please do not hesitate to contact me or Helen.

Regards,

Dr. Graham Bradley  
Senior Lecturer  
School of Accounting

## **APPENDIX 3**



### **Difference Scores and their Significance \***

**\* NOTE:**

- Non-parametric tests at a 95% significance level (shaded)
- Gaps 1 – 3: Mann-Whitney test
- Gaps 4 – 7: Wilcoxon test
- Question 13 was omitted from analysis due to lack of valid responses. Responses to the remaining questions were all valid (74 responses - 65 customers, 9 suppliers).

SERVQUAL ITEMS	GAP 1			GAP 2			GAP 3		
	Diff. Score	Z Score	Sig.	Diff. Score	Z Score	Sig.	Diff. Score	Z Score	Sig.
<b>OVERALL</b>	0.15	-0.779	0.461	0.36	-1.414	0.191	0.12	-0.140	0.908
<b>FACTOR 1</b>	0.29	-1.387	0.165	0.68	-2.245	0.025	0.41	-0.853	0.394
<b>Q3</b>	0.63	-2.118	0.034	1.08	-2.674	0.007	0.51	-1.022	0.307
<b>Q4</b>	0.49	-1.621	0.105	0.60	-1.083	0.279	0.53	-0.478	0.633
<b>Q8</b>	0.29	-0.788	0.431	0.76	-2.223	0.026	0.53	-0.730	0.466
<b>Q9</b>	0.43	-1.711	0.087	0.94	-2.561	0.010	0.73	-1.459	0.142
<b>Q10</b>	0.61	-1.993	0.046	1.19	-2.841	0.004	0.29	-0.737	0.461
<b>Q11</b>	-0.13	-0.909	0.364	0.48	-1.414	0.157	0.41	-0.792	0.428
<b>Q12</b>	0.40	-1.382	0.167	0.57	-1.163	0.245	0.81	-1.579	0.114
<b>Q14</b>	-0.35	-0.739	0.460	0.09	-0.112	0.911	-0.53	-1.598	0.110
<b>Q15</b>	0.59	-1.707	0.088	0.97	-2.160	0.031	0.89	-1.926	0.054
<b>Q16</b>	-0.32	-0.766	0.443	0.07	-0.086	0.931	0.18	-0.295	0.768
<b>FACTOR 2</b>	0.15	-0.794	0.427	0.05	-0.116	0.907	0.15	-0.290	0.772
<b>Q1</b>	-0.10	-0.243	0.808	-0.46	-1.262	0.207	-0.21	-0.489	0.625
<b>Q2</b>	-0.21	-0.992	0.321	-0.17	-0.520	0.207	0.07	-0.160	0.873
<b>Q5</b>	0.19	-0.659	0.510	0.36	-0.829	0.407	0.32	-0.478	0.632
<b>Q6</b>	0.95	-2.857	0.004	1.28	-2.947	0.003	0.52	-0.916	0.360
<b>Q7</b>	-0.07	-0.298	0.766	-0.78	-2.657	0.008	0.09	-0.069	0.945

SERVQUAL ITEMS	GAP 4			GAP 5		
	Diff. Score	Z Score	Sig.	Diff. Score	Z Score	Sig.
OVERALL	1.08	-6.781	0.000	0.39	-2.127	0.061
FACTOR 1	0.97	-6.912	0.000	0.14	-0.712	0.476
Q3	1.23	-6.167	0.000	-0.13	-0.867	0.386
Q4	1.00	-5.554	0.000	0.60	-2.211	0.027
Q8	1.03	-5.928	0.000	0.10	-0.081	0.935
Q9	0.51	-4.049	0.000	0.24	-1.237	0.215
Q10	0.92	-5.423	0.000	-0.57	-3.279	0.001
Q11	1.05	-6.147	0.000	0.37	-1.779	0.075
Q12	0.84	-5.020	0.000	0.91	-3.570	0.000
Q14	1.22	-6.166	0.000	-0.17	-1.069	0.285
Q15	1.05	-5.457	0.000	0.14	-0.211	0.833
Q16	0.94	-5.784	0.000	0.22	-1.001	0.317
FACTOR 2	1.28	-6.946	0.000	1.25	-4.648	0.000
Q1	1.64	-6.748	0.000	1.14	-4.250	0.000
Q2	1.26	-6.502	0.000	0.79	-2.939	0.003
Q5	1.17	-5.969	0.000	1.52	-4.533	0.000
Q6	1.00	-5.491	0.000	1.57	-4.583	0.000
Q7	1.29	-6.143	0.000	1.31	-4.319	0.000

SERVQUAL ITEMS	GAP 6			GAP 7		
	Diff. Score	Z Score	Sig.	Diff. Score	Z Score	Sig.
OVERALL	0.87	-2.530	0.011	0.63	-2.668	0.008
FACTOR 1	0.58	-2.312	0.021	0.41	-2.371	0.018
Q3	0.78	-1.667	0.096	0.44	-1.134	0.257
Q4	0.89	-2.530	0.011	0.67	-2.124	0.034
Q8	0.56	-1.134	0.257	0.33	-1.342	0.180
Q9	0.00	0.000	1.000	0.45	-1.633	0.102
Q10	0.34	-1.134	0.257	0.33	-1.342	0.180
Q11	0.44	-1.414	0.157	0.44	-1.633	0.102
Q12	0.67	-2.121	0.034	0.67	-2.121	0.034
Q14	0.78	-1.222	0.022	0.45	-1.633	0.102
Q15	0.67	-2.121	0.034	0.22	-0.816	0.414
Q16	0.55	-1.518	0.129	0.11	-0.378	0.705
FACTOR 2	1.38	-2.312	0.011	1.15	-2.371	0.008
Q1	2.00	-2.585	0.010	0.89	-2.070	0.038
Q2	1.22	-2.157	0.031	0.55	-2.236	0.025
Q5	1.00	-2.460	0.014	1.56	-2.226	0.026
Q6	0.67	-1.897	0.058	2.33	-2.539	0.011
Q7	2.00	-2.719	0.007	0.44	-1.414	0.157

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