

**A QUALITY ASSURANCE PROGRAM FOR AN
INTERNAL AUDITING FUNCTION**

by

**Johannes Lodewikus Potgieter
(B.Compt.Hons.)**

*Dissertation submitted in partial fulfilment of the requirements for the degree MASTER
OF BUSINESS ADMINISTRATION in the Faculty of ECONOMICS AND
MANAGEMENT SCIENCES at the POTCHEFSTROOMSE UNIVERSITEIT VIR
CHRISTELIKE HOËR ONDERWYS*

Supervisor : Prof. L.D. Coetsee
Co-supervisor : Prof. J.G. Kotzé

POTCHEFSTROOM

1994

ACKNOWLEDGEMENTS

"... in all these things we are more than conquerors through Him that loved us"

(Rom. 8:37).

I am deeply indebted to our God and Heavenly Father who so mercifully provided me with the necessary strength and wisdom to complete my studies.

I hereby wish to express my sincere appreciation to the following persons and institutions for their guidance, assistance and motivation :

- Prof. L.D. Coetsee, for his professional guidance and assistance as my supervisor
- Prof. J.G. Kotzé, co-supervisor of this study, for his valued contributions
- Prof. A.L. Combrink for editing grammar and style
- Anglo American Corporation of SA - Gold and Uranium Division, for financial support
- Dr H.A. Krüger for his encouragement and help
- Mrs G.H. Visser for the professional way in which she typed this work
- My wife, son and all my friends for their moral support and encouragement.

*This work is dedicated with love to my wife
Helen and son Corné for the years they were
basically deprived of a husband and father
while I was studying.*

CONTENTS

CHAPTER ONE

	PAGE
OBJECTIVES AND SCOPE	
1.1 INTRODUCTION	1
1.2 PROBLEM STATEMENT	2
1.3 OBJECTIVES OF THE STUDY	3
1.4 ASSUMPTIONS AND RESTRICTIONS	4
1.4.1 Assumptions	4
1.4.2 Restrictions	5
1.5 OUTLINE OF CHAPTERS	5
1.6 ABBREVIATIONS AND ACRONYMS	6

CHAPTER TWO

QUALITY ASSURANCE AND THE INTERNAL AUDITING FUNCTION

2.1 INTRODUCTION	8
2.2 QUALITY	9
2.2.1 The concepts of needs, wants, and demands	10
2.2.2 The concepts of utility and value	11
2.2.3 The concept of more quality	11
2.2.4 Productivity as an element of quality	12
2.2.5 Effectiveness as an element of productivity	13
2.2.6 Efficiency as an element of productivity	14
2.2.7 Conclusion	15

2.3	UNDERSTANDING AND MEASURING CLIENT SATISFACTION	16
2.3.1	Understanding client satisfaction	16
2.3.2	Measuring client satisfaction	18
2.3.3	Conclusions	21
2.4	QUALITY ASSURANCE/MANAGEMENT	22
2.4.1	Quality assurance/management defined	23
2.4.2	Conclusion	24
2.5	QUALITY ASSURANCE/MANAGEMENT PROGRAM	25
2.5.1	The IIA's proposed quality assurance program	26
2.5.2	Total quality management	27
2.5.2.1	Objectives of TQM	28
2.5.2.2	Philosophy of TQM	28
2.5.2.3	Principles of TQM	29
2.5.2.4	Process of TQM	30
2.5.3	Conclusion	37
2.6	QUALITY CRITERIA	37
2.6.1	The audit committee	38
2.6.2	Senior management	40
2.6.3	Common quality criteria	42
2.6.4	Conclusion	43
2.7	SUMMARY	43

CHAPTER THREE

STUDY ENVIRONMENT, METHODOLOGY AND RESEARCH TECHNIQUES USED

3.1	INTRODUCTION	45
-----	------------------------	----

3.2	RESEARCH ENVIRONMENT	45
3.2.1	The Anglo American Corporation's Gold Division	45
3.2.2	Gold Internal Audit	47
3.2.2.1	Objectives and scope of work	48
3.2.2.2	GIA's charter	48
3.2.2.3	Basic structures	49
3.2.2.4	Reporting lines	50
3.2.2.5	Clients	50
3.2.2.6	Services	51
3.3	RESEARCH SCOPE	53
3.4	RESEARCH METHODOLOGY	54
3.4.1	Approach to the literature study	54
3.4.2	The empirical study	55
3.4.2.1	Quality criteria selected for inclusion in the questionnaire	55
3.4.2.2	Design of the research questionnaire	56
3.5	RESEARCH TECHNIQUES APPLIED	59
3.5.1	Computer software	60
3.5.1.1	Quattro Pro	60
3.5.1.2	SAS	60
3.5.2	Statistical techniques	62
3.5.2.1	Correlations	63
3.5.2.2	Regressions	64
3.5.3	Optimisation technique used	65
3.6	SUMMARY	67

CHAPTER FOUR

PROCESSING AND ANALYSIS OF THE RESEARCH DATA

4.1	INTRODUCTION	69
4.2	RESEARCH DATA GATHERED	69
4.3	INITIAL PROCESSING AND ANALYSIS OF DATA	70
4.3.1	Overall client satisfaction	70
4.3.2	Ranked quality criteria	71
4.3.3	Conclusion	73
4.4	STATISTICAL PROCESSING AND ANALYSIS OF DATA	73
4.4.1	Determining the relevance of the quality criteria researched	73
4.4.2	Reducing the number of quality criteria	75
4.4.3	Determining the initial seven most important criteria	78
4.4.4	Combining the two sub-sets of independent variables	79
4.4.4.1	Importance sub-set for management	80
4.4.4.2	Quality sub-set for management	82
4.5	SUMMARY	86

CHAPTER FIVE

OPTIMISING QUALITY

5.1	INTRODUCTION	87
5.2	THE QUALITY OPTIMISATION MODEL	87
5.2.1	The model	88
5.2.2	Optimising the model	89
5.2.3	Interpreting the results	92

5.3 THE FINAL QUALITY ASSURANCE PROGRAM 96

5.4 SUMMARY 100

CHAPTER SIX

SUMMARY

6.1 INTRODUCTION 101

6.2 SUMMARY 101

6.2.1 Background 101

6.2.2 Purpose 102

6.2.3 Research environment 102

6.2.4 Research data gathered 102

6.2.5 Validating the research data 103

6.2.6 Reducing the number of criteria 103

6.2.7 Developing the final regression model for quality 105

6.2.8 Optimising the final regression model for quality 106

6.3 CONCLUSION 106

6.4 LIMITATIONS OF STUDY AND SUGGESTED FURTHER RESEARCH . 108

6.5 CONTRIBUTION OF THE STUDY 110

AFRIKAANSE OPSOMMING 111

BIBLIOGRAPHY 114

APPENDICES

1.	QUESTIONNAIRE	—	1 Page
2.	RESEARCH DATA	—	4 Pages
3.	AVERAGE RATINGS	—	1 Page
4.	RANKED RATINGS	—	1 Page
5.	SATISFACTION RATINGS	—	2 Pages

CHAPTER ONE

OBJECTIVES AND SCOPE

1.1 INTRODUCTION

The ever-increasing complexity of today's business environment is forcing business managers at all levels in an organisation to become increasingly dependent on professionals from various disciplines to assist them with the effective discharge of their expanding range of managerial duties and responsibilities. This dependency or vulnerability of managers, in turn, has had the result that they have increased their demands for an improved quality of professional services — including internal auditing — and tangible assurances that their demands are being met (Anderson, 1983:1). However, various prominent writers on the auditing profession are of the opinion that there is a growing trend of client dissatisfaction with the work of auditors. These writers claim that the causes for this growing dissatisfaction can be attributed, firstly, to the high expectations managers have of the auditor's services and, secondly, to managers' perceptions that their needs and expectations are not being totally met (Anon., 1993a:1). This implies that if services professionals — in this case, internal auditors — want to survive and prosper, they will have to ensure that their services are compatible with their clients' needs and expectations. For as long as these services do not measure up, management will not devote the required resources, nor will they apportion the rewards necessary to attract and retain talented people in the internal auditing profession. If the majority of talented internal auditors should move on to new careers in other functions of the organisation, such as finance, or leave the organisation altogether, then it will be even more difficult for the internal auditing department to meet management's needs: A typical catch-22 predicament (McHugh, 1988:23-24).

Managing and assuring the quality of products and services, and concentrating on client satisfaction, are no longer just the concern of directors and senior line managers in organisations. These concerns have become an absolute necessity for each and every professional services provider to such organisations — whether from outside or within those organisations (Stanleigh, 1993:10; Edosomwan, 1991:24).

Unfortunately, too often internal auditors tend to think that change is for their clients only, but, as Peters (1992:10) points out, if they continue thinking that, before long they will find that their services are no longer needed. In fact, Courtemanche (1992:1) mentions that the internal auditing profession was startled in late April 1991 by the news that a large banking organisation had *outsourced* (i.e. contracting out the internal audit function to others who are not employees of the organisation) its internal auditing function due to management's dissatisfaction with the effectiveness and quality of service of that department. To prevent this from happening, the onus rests squarely on the shoulders of the director of internal auditing to ensure that his (for convenience *he/him/his* will be used throughout this study, but this in no way implies any sexual bias one way or the other) department is entirely committed to providing an effective, efficient, and consistently high quality of service aimed at total client satisfaction. However, he must also be aware of the fact that management is no longer prepared to pay just any price for such services. Rice (1992:41-46) points out that there is a growing trend among managers to not only demand a consistently high quality of service, but that they also expect to get it at the lowest possible price — regardless of where they are getting it from.

1.2 PROBLEM STATEMENT

From the preceding discussion it could be argued that the director of internal auditing **must** ensure that his department's products and services (audit reports, consultancy, etc.) meet the needs and expectations of its clients if the internal auditing function is to survive and prosper.

Probably the best method of ensuring an effective, efficient and consistently high quality of internal auditing products and services is through a client-directed quality assurance/management program. There are a number of quality assurance/management programs, processes or approaches available to the director of internal auditing to choose from through which — if properly planned, implemented and maintained — he could ensure that the internal auditing department delivers the quality of products and services expected. However, to make a comprehensive quality assurance/management program totally effective in its entirety, requires more than sufficient financial and manpower resources — resources that are seldom available in abundance in an internal auditing department.

The actual selection of the most appropriate quality assurance/management program for a particular internal auditing department poses its own problems, but there is more than adequate literature available (as discussed later in chapter two) to guide the director of internal auditing to make the right decision in this regard. The director of internal auditing's problem, therefore, is not really so much as to which quality assurance/management program to choose or how he should go about choosing it. The difficulty, or problem, lies in deciding where he should concentrate his efforts and scarce resources within the chosen quality assurance/management program to achieve the maximum improvement in product and service quality over the shortest possible period of time.

The allocation of scarce resources can obviously be done on a trial-and-error basis, but such a method can be frustrating, time-consuming and expensive while the chance of achieving the desired results is probably less than equal. Furthermore, any apparent failure of the chosen quality assurance/management program could not only have a negative impact on the internal auditing department's credibility and image in the eyes of its clients, but could also demotivate the department's staff to such an extent that they may resist any further attempts to rectify the situation — if the director of internal auditing is allowed any further attempts!

From the above, it could be argued that the director of internal auditing needs some tool, model or program which he could use to help him. *Firstly*, he needs help in identifying the most important quality criteria/factors/measures (hereafter the use of any one of these terms should be read to also include the other two) — as perceived by the internal auditing department's main clients. *Secondly*, he needs assistance and guidance in the allocation of his department's scarce resources between the identified quality criteria so as to obtain the maximum benefit to be gained from a quality assurance/management program.

1.3 OBJECTIVES OF THE STUDY

This study was initiated due to the reality of the problem outlined above as experienced by the author in his capacity as head of one of the larger internal auditing departments in South Africa, namely the internal auditing department — officially known as *Gold Internal Audit (GLA)* — of the Anglo American Corporation of South Africa Limited's Gold and Uranium

Division. The specific objectives of the study are to:

- Determine the criteria most often used by *GLA's* main clients to evaluate/assess the quality of products and services provided to them by the department.

(For the purposes of this study the term *main clients* refers to two specific groups of people within the organisation, viz. the *audit committee* — consisting of top/executive managers — and *senior operating managers*.)

- Formulate and propose a model or program (the term *program*, as indicated in the study's title, is preferred for the purposes of this study) that could be used by *GLA* as an aid in deciding upon the allocation of scarce resources with the objective to optimise the potential benefits to be gained from the implementation of an official quality assurance/management program.

1.4 ASSUMPTIONS AND RESTRICTIONS

This study was conducted with the following specific assumptions and restrictions in view, viz:

1.4.1 Assumptions

Bearing in mind the objectives of this study and, therefore, the relatively small but specialised readership for which it is intended, it can justifiably be assumed that the reader:

- Is more than adequately conversant with the philosophies, principles, functions, activities, roles and processes of an internal auditing department. Internal auditing as such is, therefore, not specifically discussed in this study.

- Has a fair understanding of statistical concepts and techniques, including the calculation of correlations, multiple linear regression analysis and the optimisation of linear regressions. Explanatory discussions as to the workings of the statistical techniques used in this study are, therefore, not comprehensive since such information is freely available in a number of statistical handbooks.

1.4.2 Restrictions

Due to the fact that the study was initiated to solve a practical problem in the author's own work environment, the field (or environment) and scope of the research work were restricted as follows:

- The research *field* was restricted to the Gold and Uranium Division of the Anglo American Corporation of South Africa Limited (AAC).
- The *scope* of the research, in turn, was restricted to include only those employees within AAC who could make a meaningful contribution to the study, namely GIA's main clients (as defined in section 1.3 above).

Although the research environment and scope were restricted to one specific organisation only, it must be pointed out that the results of the study could be useful for any organisation's director of internal auditing to assist him in finding a practical solution to the same or a similar problem as outlined in section 1.2 above.

1.5 OUTLINE OF CHAPTERS

The remaining chapters of this study and their contents are as follows:

- **Chapter two** — In this chapter all aspects relating to the quality of products

and services — as applicable to this study — are investigated and discussed with reference to available literature. Specific attention is given to the concept of quality and its related elements; client satisfaction and the measurement thereof; the concept of quality assurance; and quality assurance/management programs in general. This chapter is also used to identify those quality criteria most often used by an internal auditing department's main clients to evaluate/assess the quality of products and services they receive from their internal auditing departments.

- **Chapter three** — The research environment and scope, as well as the methods, statistical techniques and other techniques used for the research process are described and briefly explained in this chapter.
- **Chapter four** — In this chapter the research data collected is analysed and investigated by means of the methods and techniques described in chapter three. The objective is to develop an adequate linear regression model from the data gathered which will be optimised in chapter five.
- **Chapter five** — This chapter deals with the optimisation techniques applied to the linear regression model developed in chapter four. In addition, a general program is developed to assist the director of internal auditing in allocating his department's resources to the identified critical quality criteria in order to optimise the potential success of his chosen quality assurance/management program.
- **Chapter six.** This, the last chapter, consists of a general summary of the study results and conclusions reached. Proposals are also made for possible future research.

1.6 ABBREVIATIONS AND ACRONYMS

Other abbreviations and/or acronyms also used in the remainder of the study are:

- **CEO** = Chief Executive Officer

- *CFO* = Chief Financial Officer
- *DIA* = Director of internal auditing
- *IAD* = Internal auditing department
- *IIA* = The Institute of Internal Auditors, Inc.
- *ISO* = International Standards Organisation
- *PSRC* = The Professional Standards and Responsibilities Committee
- *SABS* = The South African Bureau of Standards
- *SIAS* = Statement on Internal Auditing Standards
- *Standards* = Standards for the professional practice of internal auditing
- *TQM* = Total quality management

Note: The term *director of internal auditing (DIA)*, as used in this study, is generic in nature and identifies the top position in an internal auditing department.

CHAPTER TWO

QUALITY ASSURANCE AND THE INTERNAL AUDITING FUNCTION

2.1 INTRODUCTION

The central theme of this study is the *DIA*'s basic responsibility to ensure that the *IAD* provides its clients with the right quality of products and services in the most efficient, effective, economical and professional manner possible. In order to do so, the *DIA* must have a thorough understanding of what *quality* is and how the *IAD*'s clients evaluate/assess the quality of internal auditing services provided to them. This chapter, therefore, consists of a review of available literature with the objectives of:

- Examining and defining the term *quality* and establishing what its various concepts and elements are and how they affect the internal auditing function.
- Examining the term *client satisfaction*, what it means and how it could be measured.
- Examining and defining the term *quality assurance*. In the interest of facilitating comprehension two specific quality assurance/management programs that are available to the *DIA* — through which he could assure/manage the quality of his department's products and services — are also briefly discussed.
- Establishing what constitutes *quality* in the eyes of the *IAD*'s main clients (as defined in section 1.3 of chapter one). This is done by identifying those quality satisfaction or acceptance factors/criteria/measures (hereafter the use of any one of these terms should be read to also include the other two) most often used by main clients to assess the quality of internal auditing services.

2.2 QUALITY

Probably one of the better ways of introducing any subject is by defining it. However, there appears to be no generally accepted definition of the term *quality*. The following are but a few of the many definitions or explanations offered by a number of writers on this, apparently, elusive term:

- Quality means conformance, not elegance (Lash, 1989:7).
- Quality means to *do it right the first time* (Stewart, 1992:19).
- Quality is the extent to which products and services satisfy the requirements of internal and external customers (Stanleigh, 1993:10).
- Quality is what the customer perceives it to be (Hill, 1992:5).
- Quality's basic premises are customer satisfaction; zero defects; delivery at the right time; a vendor/customer partnership; and value for money (Capuder, 1992:5).
- Quality is the compliance with the customers' requirements regarding the product as well as service. The emphasis of quality — from an auditing point of view — is to add value to the customer (Anon., 1993b:7-8).
- Quality is the organisation-wide practice of meeting customer expectations (Lloyd Chester, 1993:30; Macklem, 1994:24).

The common denominator in the above definitions/explanations appears to be the client himself. The term *quality* can, therefore — and for the purposes of this study — be defined as follows: ***Quality is what the client perceives it to be when measured against his own set of expectations and/or acceptance criteria.***

With the above definition of quality in mind, the various concepts and elements of quality can now be investigated.

2.2.1 The concepts of needs, wants, and demands

The quality of a service, whether real or perceived, is not something that exists in a vacuum. Kotler (1988:3-4) points out that it is important to realise that before the quality of a service becomes an issue, the client must, first of all, have a *need* and *want* for such a service. If there is no need or want for a specific service, such a service will just not be in *demand*, regardless of its quality. These terms, seen from a managerial point of view, can be defined as follows:

- A *need* is a state of felt deprivation of some basic satisfaction (e.g. certainty, security, assurance, confidence — in other words, basic needs for the survival of any manager).
- *Wants* are desires for specific satisfiers of needs (e.g. information and support — things that are continually shaped and reshaped by internal and external business forces).
- *Demands* are wants for specific services that are backed up by an ability and willingness to buy them (i.e. a specific service must not only be available to managers, but they must also be willing to buy and be able to pay for it — such as internal or external auditing services, or specialised consultancy services provided by independent organisations that can satisfy the needs and wants of management for the same services).

Sawyer (1984:42) states that the basic reason why managers *need* competent and professional internal auditors is to do what they (managers) would do in appraising the efficiency, effectiveness and economy of their own responsibility areas if they had the time and if they really knew how. Sawyer's statement may be valid, but if one considers what has in general been said in the introductory section of chapter one concerning the auditing needs and expectations of managers, read together with the above proposed definition of quality, it should be obvious to any *IAD* that being needed, alone, is not enough. In order to succeed and prosper an *IAD* will also have to ensure that its nature, range and quality of services offered are in line with its clients' expectations. The *DIA*, therefore, should first ensure that he identifies and fully understands his clients' needs, wants and demands before he can

consider developing any form of quality assurance/management program for his department.

2.2.2 The concepts of utility and value

A further important issue for the *DIA* to understand and address is how managers in fact choose among the available services that might satisfy their needs for internal auditing services. The guiding concepts here are *utility* and *value*. *Utility* is the manager's estimate, or perception, of the specific service's overall capacity to satisfy his needs. The *value* of a service, in turn, is linked to a manager's perception of what he gets for the price he pays (Kotler, 1988:5-6).

These two concepts are of the utmost importance to the *DIA*. It will be useless for the *DIA* to have a department that can provide all the internal auditing services its clients need and want, but they don't know of its existence, or perceive it to be too expensive, or inferior in quality. The *DIA* should, therefore, in addition to establishing his clients' needs and wants, also pay special attention to the concepts of utility and value in his quest to *sell* his department to its clients.

2.2.3 The concept of more quality

To consistently provide the *right* quality of services basically involves specifying clients' current needs, meeting fully those specifications, monitoring clients' satisfaction, and initiating action plans to meet future specification changes (Morley, 1988:10). However, Kotler (1988:459) points out that the client's perception of the quality of a service can also vary with the level of *performance* of the service provider. This means that although the services of two *IADs* might conform to an identical set of required quality criteria, one *IAD's* services could in fact be perceived to have *more quality* in the eyes of its clients if that *IAD* performs at a higher level when measured against specific performance attributes valued by most of its clients. Such valued attributes — in the case of an internal auditing function — could include:

- Displaying an open and sympathetic attitude towards the auditee

- A professional departmental image
- Higher standards of presented audit reports
- Absence of audit surprises to management

Kotler (1988:459) also mentions that the level of performance — or *more quality* — could either be genuine or perceived. Whatever the case may be, it is important for the *DIA* to remember that those clients who value *more quality*, will also be willing to pay more for services designed with the aim to provide it. Peters (1992:14) is of the opinion that the *DIA* should not only make his staff aware of the concept of *more quality*, but he must also instill an enthusiasm for creativity in them to get it right the first time (Peters, 1992:14).

2.2.4 Productivity as an element of quality

Production, according to Gibson *et al.* (1988:37), reflects the ability of an organisation to produce the quantity and *quality* of outputs that its environment demands. Productivity, in turn, means the quantification of an organisation's production activities by dividing measurable outputs by inputs.

This basic explanation of what production and productivity are, is in principle supported by Pelfrey and Peacock (1993:26). They argue, however, that this is not totally valid for white-collar workers — such as internal auditors — where simply defining the inputs and outputs is complicated, and quantifying their results is even more complex.

Lampe and Sutton (1991:51-53), also referring to the difficulties in measuring white-collar workers' productivity, cited that different quantitative measures of outputs to inputs are required for the internal auditing function, namely at the task, audit, auditor, department, organisation, and profession levels. Lampe and Sutton suggest that a conceptual definition of internal audit productivity — that permits variation across different levels and clients, but retains the central idea of comparing some form of outputs to inputs — could be as follows:

Internal audit productivity is dependent on the systemic conversion of inputs measured in terms of resource efficiency to outputs measured in terms of goal effectiveness by the system of internal auditing under consideration.

Lampe and Sutton's proposed definition suggests that both efficiency and effectiveness are key elements of productivity. In fact, to illustrate the importance of effectiveness and efficiency for productivity, Greenwald (1992:10) states that productivity can even be written in the form of an equation: *Productivity = effectiveness + efficiency*. These two elements are briefly discussed in the following two sections.

2.2.5 Effectiveness as an element of productivity

Scudder and Kucic (1991:344) state that *effectiveness*:

...is concerned with the quality of the finished product and its appropriateness to the problem/situation for which it was designed.

If one closely examines this explanation of effectiveness, it can be argued that effectiveness basically means little more than producing a desired result. However, since the *quality* of the product is specifically mentioned by Scudder and Kucic, and recalling the definition of quality itself (see section 2.2 above), it can be said that internal auditing effectiveness reflects the extent to which the *IAD* meets the needs of its different clients. This explanation of internal auditing effectiveness is in line with Stokes's (1986:13) view thereof and, therefore, is accepted as valid for the purposes of this study.

In the above explanation of internal auditing effectiveness it is recognised that an *IAD*'s effectiveness can be viewed differently by different clients and participants in the internal audit process. In other words, the *CEO*, *CFO* and other executive managers (normally represented by the audit committee), senior operating managers, external auditors, the *IAD*'s own staff members, and even auditees, may all have different perceptions of what constitutes an effective (or high quality) *IAD*.

In light of the above it can be argued that the *DIA*'s task of satisfying all his clients' needs and expectations in an effective manner could be rather difficult and complex, especially if one considers the large number of clients a typical *IAD* serves in a major organisation. Lemieux and Kosiek (1989:89-93), however, suggest that the *DIA* could largely overcome this problem through staff training. By training his staff in different skills, and making them more client oriented, the *DIA* could offer his various clients higher-level, more personalised

and diversified internal auditing services (over and above the traditional internal auditing services).

Although a more diversified range of products and services may increase the *IAD*'s chances of being judged more effective by more people in its client-base, providing such products and services through extensive training could be materially expensive. In addition, the risk also exists that expensive training and other action plans — if not properly planned and directed — could eventually prove to be damaging to an *IAD*'s credibility, especially if limited resources are spent without producing the desired results — something (i.e. risk) that this study aims to reduce.

2.2.6 Efficiency as an element of productivity

The second element in the productivity equation is efficiency. Scudder and Kucic (1991:344) state that:

Efficiency is concerned with the resources consumed in producing a given application in a timely manner.

If Scudder and Kucic's definition of the term *efficiency* (mainly applicable to information systems) is adapted for internal auditing, efficiency will generally refer to the *IAD*'s ability to achieve its audit objectives with the utilisation of fewer resource inputs. However, Lampe and Sutton (1991:53-54) point out that it must be understood that a more efficient audit, in terms of reduced inputs, is not necessarily more productive unless it is accomplished with equal or greater effectiveness. On the other hand, an audit assignment which is recognised as more effective must be similarly questioned for productivity unless efficiency is equal to or improved upon relative to previous audits or other similar audits.

Most of the reasons why the *DIA* should strive for an efficient *IAD* are apparent (e.g. lower auditing costs, better utilisation of manpower, etc.), but the following, according to Houck (1994:33), are not so obvious:

- **Credibility** — It is imperative that internal auditors, when recommending ways to improve productivity, should not be regarded by management as

using more resources than needed to accomplish their task (this statement basically confirms the closing remarks in the preceding section).

- **Risk** — Every hour spent by the *IAD* on inefficient or unnecessary tasks means that other areas are left untouched. This implies that as inefficient auditing increases, so does the risk that internal auditors will fail to accomplish other important objectives also increase.
- **Drain on organisational resources** — Managers and auditee staff spend much time preparing for internal audits and/or answering auditors' questions. When audits are inefficient, the ripple effect could reduce the profitability and effectiveness of the entire organisation.
- **Reputation** — Internal auditing, being an ideal catalyst for change in the organisation, must be seen and perceived to be efficient to earn the respect of management. Without such respect change is almost impossible.
- **Staff turnover** — High staff turnover can often be traced to boredom from conducting inefficient audits. Efficient auditing makes audit assignments more enjoyable and challenging.

Efficiency, as can be seen from the above, largely revolves around costs and — as has been pointed out in the introductory section of chapter one — management is becoming increasingly cost sensitive. The *DIA* should, therefore, ensure that whatever he does, is in fact cost justifiable and that it is both seen and perceived by his clients to add value to the organisation as a whole. Again, this study aims to provide the *DIA* with a model/program which he can use to maximise the *IAD's* overall efficiency with the limited resources available to him.

2.2.7 Conclusion

Considering the above general discussion there can be little doubt that *quality*, in a generic

context, is complex in nature. The fact that quality is constantly changing, that it can either be real or perceived, that it is seldom the same to everyone, and that its various concepts and elements are so over-lapping and intertwined, does not make the *DIA*'s task to ensure that his department delivers what is expected from it, any easier. Nevertheless, by knowing and understanding the various concepts and elements of quality, the *DIA* can, at least, devise ways and means to establish what type and quality of products and services are really required and expected from his department by its various clients.

2.3 UNDERSTANDING AND MEASURING CLIENT SATISFACTION

Following on the preceding discussions, it can be said that the main reason why any organisation should aim to provide its clients with the best quality of products and services, is to achieve total client satisfaction. Kennedy (1994:1) states that client satisfaction — through the right quality of products and services — not only leads to client loyalty and retention, but also provides an organisation with a distinct competitive advantage which, in turn, leads to organisational growth and success.

With the foregoing in mind, the objectives of this section are, firstly, to investigate what the term *client satisfaction* really means and, secondly, to discuss the importance of quality and client satisfaction measurement in general.

2.3.1 Understanding client satisfaction

Kennedy (1994:1-2) mentions that client satisfaction basically involves the *total experience* of the client with the product or service that is being used/consumed. Kennedy goes on to say that while the focus in recent years has been on service excellence — in terms of the so-called *moment of truth* service delivery experience — the quality of the product (whether tangible or intangible) being offered is integral to the client's overall experience of that product or service. Brookes (as quoted by Kennedy, 1994:1), defines client satisfaction as follows:

Satisfaction is defined as the buyer's cognitive state of being adequately or inadequately rewarded in a buying situation for the sacrifice he has undergone. The adequacy is a consequence of matching actual past consumption and purchase experience with the reward that was expected from the brand.

This definition suggests that client satisfaction basically refers to the concepts of *utility* and *value* of products and services as discussed earlier (see sub-section 2.2.2 above). In other words, client satisfaction has much to do with client expectations. This means that if one wants to understand client satisfaction one has, first of all, to understand how a client's expectations are influenced.

Brookes (as referred to by Kennedy, 1994:2) states that clients' expectations — in specific terms — are:

- Confirmed when the performance is approximately equal to expectations.
- Positively influenced (disconfirmed) when the product or service's performance exceeds expectations.
- Negatively influenced (disconfirmed) when the performance is less than expected.

This means that the extent to which a client's expectations are confirmed or not, could depend on a number of criteria, including:

- The product or service itself, including a client's prior experiences, brand connotations, and any other symbolic elements.
- The context in which the product or service was acquired and used, including aspects such as the content and quality of communications from suppliers or service providers and social/work referents.
- Individual characteristics, such as persuadability, product or service category knowledge and interest, and perceptual distortion. (These criteria basically relate to the needs, wants, and demands of clients as discussed in sub-section 2.2.1 above.)

Thus, the *DIA* must take cognisance of the fact that there are a number of factors that could influence a client's *total experience* of an *IAD*'s products and services which, in turn, could lead to the client's ultimate satisfaction or dissatisfaction with those products or services. Finding out what those factors are, is of crucial importance to the *DIA* if he wants to develop and implement a truly effective quality assurance/management program for the *IAD*.

For the development and implementation of a quality assurance/management program the *DIA* must realise that although his department's products and services are different components, they are, nevertheless, entwined in the client's *total experience* since they are basically consumed at the same time.

Products are tangible while services are intangible — i.e. reports and consultancy in respect of internal auditing. Quality control (through a quality assurance/management program) of a product, on the one hand, basically involves measuring and comparing the finished product against rigorous standards. Quality control of services, on the other hand, entails watching a process unfold and evaluating it against the client's judgement. In other words, service satisfaction, as pointed out by Kennedy (1994:3), is the result of a dynamic, not a static, encounter. The client experiences both the process and the outcome, and evaluates both. A poor product cannot be overcome by a good relationship with a client, at least not for long. Nor will a good product overcome poor treatment of the client, unless the situation is a unique one. The importance of total client satisfaction with the overall functioning of the *IAD*, therefore, cannot be over-emphasized.

2.3.2 Measuring client satisfaction

An *IAD* cannot automatically assume to be meeting its clients' needs and expectations unless it measures these on a regular and ongoing basis. However, the measurement of client satisfaction can be difficult and the *DIA* must be aware of its possible pitfalls.

Quality, as was discussed in section 2.2 above, is an elusive and indistinct concept, and its elements are not easily articulated by clients. The interpretation and measurement of quality, therefore, also present problems for researchers. Parasuraman *et al.* (1985:49) state that the quality of services — contrary to the quality of products — had (at that stage) been discussed

in only a handful of writings, and examination of those writings, together with other available literature on services, suggested three underlying theses:

- Service quality is more difficult for the client to evaluate than product quality.
- Service quality perceptions result from a comparison of the client's expectations with actual service performance.
- Service quality evaluations are not made solely on the outcome of a service; they also involve evaluations of the **process** of service delivery.

Because of service intangibility, service providers (such as internal auditing) may find it more difficult to understand how their clients perceive a service and, therefore, service quality — thus making client satisfaction research difficult.

Kennedy (1994:7-11) suggests that some of the causes contributing to the difficulty of researching client satisfaction are as follows: It provides feedback on people's personal performance; a comprehensive service quality and client satisfaction research program can be expensive; it could provide such large amounts of superfluous data that management could become disillusioned with the whole research project and eventually abandon it as a waste of time and money. These research problems, according to the Kennedy, can be created by a variety of factors, including the following:

- **Management commitment** — If the service provider's management personnel are ambivalent in their commitment to client service and the quality of such services, then it follows that they will not be interested in taking action on the research results. If managers do not *buy* into the service quality and client satisfaction process or program, then employees who are actually at the service interface, in turn, cannot be expected to be committed to following it.
- **Research design and focus** — Many client satisfaction surveys are designed in a too generalised fashion and are carried out at too broad a level. Unless these surveys are sharply focused it is difficult for managers to apply the

results. (It is for this reason that the research area of this study was focused only on the *IAD*'s main clients as defined in section 1.3 of chapter one.)

- ***Continuous measurement*** — The measurement technique to be used in any quality tracking research is largely dependent upon the method adopted and findings obtained in the developmental stage thereof. One of the main keys to success in this process is simplicity — far too many tracking surveys are lengthy and unwieldy, with insufficient focus upon the key service criteria that have been identified for improvement or upon the most important service standards which need to be maintained. (The whole approach to this study reflects the author's general support for this point of view.)
- ***Need for re-assessment*** — There is a need for a constant re-assessment of the tracking survey. Such surveys should ideally evolve gradually over time, but in practice there is sometimes a need to change the basis of the survey quite fundamentally. Some of the reasons why the survey may need to be revised include:
 - Improved data collection techniques.
 - Clients' needs and expectations change over time.
 - Re-designing the survey ensures commitment and ownership by any new managers who have been appointed.
- ***Presentation of the data*** — Many surveys fail because the data is not presented in a user-friendly manner. Points for researchers to consider are:
 - Firmness in deciding the reporting time scales. Solidly based quarterly or six-monthly data will be of more value than a continual stream of monthly data based on relatively small sample sizes which might show artificial and unreliable changes.
 - Reporting by *exception*, that is, concentration on only those aspects that have shown significant improvement or deterioration.

- ***Application of the data*** — If management does not know how to take action on the data, then such data is useless. In applying the research results, there is a danger that the research may be looked at in isolation. It is extremely important that it is examined in the context of other internal and external operational measures.

2.3.3 Conclusions

The *DIA* could probably avoid many of the pitfalls and problems associated with understanding and measuring client satisfaction if he observes the following basic guidelines:

- Ensure that there is total commitment — not just from the top, but from everyone within the *IAD* who is likely to receive and is expected to act upon the measurement data.
- Get involved at the heart of any quality assurance/management program and avert the possibility that it merely becomes an information system.
- Set and maintain responsibility for quality and client satisfaction surveys at the highest level possible.
- Ensure that sufficient time is allocated at the initial stage of a quality assurance/management program to identify, reduce and validate clients' quality acceptance criteria so that one can develop the best possible methodology or tool for measuring change.
- Keep any quality/client satisfaction survey results simple but relevant; provide interpretation, not just numbers; be courageous about recommending the implementation of the results obtained.
- Be constantly alert to changing client needs.

Understanding client satisfaction, and introducing a relevant and reliable client satisfaction measurement process, will not only enable the *IAD* to stay close to its clients' demands, but will also enable the *IAD* to take action on such measured results by implementing the changes that are required to meet their expectations.

In conclusion, and after considering everything that has been discussed above, the definition for client satisfaction offered by Bailey and Pearson (1983:531) probably best summarises this section of the study, viz:

... satisfaction is the sum of one's positive and negative reactions to a set of factors. An individual's feeling must, in this model, be placed somewhere between a 'most negative' reaction and a 'most positive' reaction.

In other words, Bailey and Pearson basically state that client satisfaction is something that can be calculated. In order to do so, they propose the following model:

$$S_i = \sum_{j=1}^n R_{ij} W_{ij}$$

Where: R_{ij} = The reaction to factor j by individual i
 W_{ij} = The importance of factor j to individual i

In research work done by Krüger (1993), Bailey and Pearson's model for calculating client satisfaction was used and it was found to produce acceptable results. The above definition of and model for calculating client satisfaction, therefore, are regarded as valid and accepted without reservation for the purposes of this study.

2.4 QUALITY ASSURANCE/MANAGEMENT

Considering what has been discussed thus far, there can be little doubt that the quality of an IAD's services, and the client's satisfaction therewith, are of crucial importance to the survival and long-term success of the internal auditing function. In order to ensure that the IAD's products and services conform to the needs and expectations of its clients, the DIA should implement and maintain an effective *quality assurance/management program*. In fact, the IIA — being the only internationally recognised professional association for internal auditors — specifically requires that:

The director of internal auditing should establish and maintain a quality assurance program to evaluate the operations of the internal auditing department (IIA, 1978:25).

The DIA, as has been mentioned earlier, must never take it for granted that his department's

clients will automatically be satisfied with the quality of its products and services, regardless of how strictly the *IAD* complies with its charter or the *IIA*'s standards.

Although an *IAD*'s clients may initially be satisfied with the department's products and services — when they conform to *external* standards — the *DIA*, nevertheless, must always realise that what his clients may currently regard as excellent services, may not be true in a year or so from now. It is, therefore, of the utmost importance that the *DIA* must remember that the client always determines what quality is, and that the market place — that is, the competition (e.g. external auditors and other independent specialist consultants in the internal auditing field) — will ultimately change the client's perception of quality (Anon., 1993c:5-6; Macklem, 1994:24). Any quality assurance program, therefore, should always be flexible and totally client focused to be truly effective over the long-term.

2.4.1 Quality assurance/management defined

According to Root (1993:C1-23) the term *quality assurance/management* — in respect of internal auditing services — can basically be explained as a series of control techniques to reasonably assure that the internal auditing function is operating in accordance with the high standards established for it. Root's explanation is more or less in line with that of the *IIA* which, in guideline .01 of *Standard 560 (IIA, 1978:25)*, states that the purpose of a quality assurance/management program is to:

... provide reasonable assurance that audit work conforms with these [the IIA's] Standards, the internal auditing department's charter, and other applicable standards.

The above explanations of quality assurance/management, however, do not give full recognition to the importance of the client in the quality assurance/management process. A more acceptable explanation in general terms of what quality assurance/management is, is given by Livni (1994:26) and reads as follows:

Quality [assurance/management] is an organisational strategy which utilises facilities, equipment and the employees to provide products and services that completely satisfy both internal and external customers by meeting their explicit and implicit expectations.

Livni's explanation recognises the importance of the client in the whole quality assurance/management process. However, it fails to specifically mention that there should be appropriate standards against which the results of the quality assurance/management process or program should be measured.

By using the above explanations as a basis, and combining it with the definition of quality (as defined in section 2.2 above), a suitable definition of quality assurance/management for internal auditing purposes could be as follows: *Quality assurance/management is the strategies, systems, plans, and techniques used by an IAD to reasonably assure that its activities, processes and outputs are complying with the highest possible work standards and quality criteria as established for, and demanded from it, by its profession and main clients alike.*

2.4.2 Conclusion

It can be argued that the above proposed definition of quality assurance/management not only recognises the need for appropriate standards against which the *IAD* could measure its overall performance as a professional services function. It also recognises the fact that the department's outputs must, at the end of the day, satisfy its main clients' needs and expectations.

It is evident from the preceding statement that quality assurance/management aims to achieve two objectives. Firstly, it aims to assure that the *IAD's* internal activities, processes and structures are so designed and managed that the department can truly be judged as being professional in all aspects of its internal operations. Secondly, it aims to ensure that the *IAD* does not become complacent with itself, but that the department stays focused on the needs and expectations of those who established it in the first place — the audit committee and senior management.

Considering what has been said in the preceding paragraph, it almost goes without saying that a *DIA*, in order to implement an effective quality assurance/management program and achieve the objectives of quality assurance/management, must have a thorough and in-depth knowledge of the whole internal auditing discipline. He must also fully understand the

concepts of *quality* and *client satisfaction* together with their underlying principles and elements.

2.5 QUALITY ASSURANCE/MANAGEMENT PROGRAMS

Before continuing the literature study, it is important to point out that this study is not about which quality assurance/management program or process is best suited for an *IAD*, nor is it specifically concerned with the actual phases or contents of any such program. Instead, it is about assisting a *DIA* to make a quality assurance/management program measurably more client-focused and successful — regardless of the actual quality assurance/management program chosen for improving the quality of an *IAD*'s products and services provided to its clients. In other words, the reason for including this section in the literature study is merely for completeness and to show how everything that has been discussed previously basically comes together in a comprehensive quality management program or process.

With the foregoing in mind, the aim of this section of the literature study, therefore, is not to discuss each and every type or variation of the numerous quality assurance/management programs that are available to the *DIA*. As pointed out in chapter one, there is sufficient literature [e.g. Sumners and Toerner (1993); Stowell and Hunt (1993); Anderson (1991); Chambers *et al.* (1990); and Anderson (1983)] available on this topic for the *DIA* to use to assist and guide him in reaching the right decision as to which quality assurance/management program will be most suitable for his department's specific needs and circumstances.

However, to facilitate an overall understanding of the quality assurance/management process, two specific quality assurance/management programs or processes will be discussed here. The first to be briefly discussed is the *IIA*'s own proposed quality assurance/management program. The second (described in some detail) is the so-called *Total Quality Management (TQM)* process/program. The reason why these two programs or processes were chosen for inclusion in the literature study is because the author is of the opinion that if they are used in conjunction with one-another, and if properly implemented and managed, they could lay the foundation for a truly effective, efficient and economical quality assurance/management program that will enable any *DIA* to achieve the objectives of quality assurance as outline in sub-section 2.4.1 above.

2.5.1 The IIA's proposed quality assurance program

The *IIA*'s proposed quality assurance program, as contained and explained in *Standard 560* (*IIA*, 1978:25-25) and *SIAS No.4* (*PSRC*, 1986:1-8), should be considered by the *DIA* as a general guideline in respect of the basic elements and minimum professional standards pertaining to a quality assurance program aimed mainly at controlling/managing the **internal** processes, activities and standards of an *IAD*.

The *IIA* basically asserts that the *DIA* — by implementing and properly managing its proposed program — will be in a position to maintain the *IAD*'s capability to fulfil its basic internal auditing responsibilities in an effective, efficient and professional manner. In addition, the *DIA* will also achieve/maintain a high level of credibility with management, the audit committee, and others who rely on the work of the *IAD*.

Standard 560 and *SIAS No.4* essentially state that a quality assurance program for an *IAD* should, at least, be designed to include the following three fundamental quality assurance elements:

- **Internal supervision** — This must be a continuous process to ensure conformance with internal auditing standards, departmental policies, and audit programs. Internal supervision should also extend to employee training, employee performance evaluation, time and cost control, as well as all other administrative areas of the *IAD* (Anon., 1987:6).
- **Internal reviews** — These reviews, which are basically self-assessments of and by the *IAD*, should be carried out periodically to appraise the quality of audit work performed.
- **External reviews** — This type of review should be carried out at least once every three years by persons who are independent of the specific *IAD* and who have no real or an apparent conflict of interest. The basic objectives of such a review are to appraise the quality of the *IAD*'s overall operations and to determine to what extent the department complies with the *IIA*'s

various *Standards* in particular.

Braiotta (1993:62) suggests that external reviews of the *IAD*'s activities should ideally be carried out by the organisation's independent external auditors as they have a special interest in the internal auditing function's performance and quality of work outputs. The reason for this is that the external auditor's general evaluation of the overall quality of the internal audit function will influence his judgment as to the likely use which may be made of the work performed by the internal auditors. Warner (1984:20-24), although not directly in disagreement with Braiotta, argues that an independent peer internal auditing department will be a better choice to conduct an external review of another *IAD*. Warner basically states that a peer *IAD* is better equipped to understand the various activities and difficulties, as well as the applicable standards and the unique circumstances prevailing in any *IAD*. The choice of who to use, however, rests with the *DIA* and the audit committee.

Cascarino (1992:6) — supported by Hill (1993:26) — suggests that for the purpose of determining and setting standards for the *IAD*'s internal processes, the *DIA*, in addition to making use of the *IIA*'s various *Standards* and its other pronouncements, should also consider the use of other predefined internationally accepted quality standards, such as the *ISO 9000* series of standards (the South African equivalent is the *SABS 0157* series of standards).

2.5.2 Total quality management

Probably the most current and comprehensive quality assurance/management program used by many services and production organisations is *TQM*. This program is both a management philosophy and a systematic process for continuously improving products and services with the client as the central focus point (Hogan, 1994:3; Rand, Jr., 1994:23). TQM

In the following few paragraphs the philosophy, principles, and process of a *TQM* program are briefly discussed. However, because *TQM* assimilates most of that which has been discussed previously in this chapter, more space and time will be allocated to its description.

2.5.2.1 *Objectives of TQM*

With reference to internal auditing, *TQM* basically seeks to involve all the employees of an *IAD* in the quest to produce the quality of services that will satisfy their clients. It is a team activity that is aimed at instilling pride in individual and group performance, that encourages creativity and innovation, and that motivates and empowers audit teams to create a new climate in the work place that is conducive to the continuous improvement of the internal auditing process so as to provide the services that will satisfy the needs and expectations of clients with decreasing resources (Julien & Lampe, 1993a:66). In other words, *TQM* entails much more than just operational quality. It means striving for excellence in everything the *IAD* does. *TQM*, therefore, is comprehensive. Everything that the *IAD* undertakes should be part of a total effort to establish a *TQM* culture within the department, where quality reigns supreme (Van Der Merwe, 1991:1).

2.5.2.2 *Philosophy of TQM*

The philosophy of *TQM*, simply put, is that it is a process for creating competitive advantage by focusing the *IAD* on what is important to the client. This basic philosophy of *TQM* is supported by three key beliefs:

- That quality is what the client says it is.
- That the process of *TQM* must be thoroughly and totally integrated into every activity and process of the organisation, including its basic strategies, culture and management systems.
- That nothing in an organisation will improve until it is measured, and as soon as something is measured and controlled, it will automatically begin to improve.

This requires that every aspect of the *IAD*'s activities, processes, and products (outputs), as well as its main clients and their needs and expectations, must be properly identified and documented. Adequate and meaningful measurement criteria and performance standards should also be developed for them (Stanleigh, 1993:10; Ludeman, 1992:52).

2.5.2.3 Principles of TQM

There are three important interrelated **principles** behind *TQM* that every employee in the *IAD* must understand in order to help ensure that the desired quality of outputs is achieved and to make continuous productivity and service improvements possible. These principles relate to people, clients, and systems (Hill, 1992:5; Van Der Merwe, 1991:5; Macklem, 1994:24-26):

- **People** (in this case internal auditors) serve clients through structures, processes, documented policies and procedures, etc. — in other words, the *internal auditing system*. To make the internal auditing system effective and efficient, the *IAD*'s employees must be totally committed and involved with the overall internal auditing system. This requires effective participation by empowered employees to solve work related problems and to continuously improve processes and the work environment.
- **Clients'** satisfaction with the *IAD*'s services must be such that they become the department's primary supporters. This requires that every task each internal auditor fulfils should be to the benefit of the client. This, in turn, necessitates that internal auditors must possess good communication and interactive skills. When these skills are high, internal (the *IAD*) and external (the organisation) partnering is fostered.
- **Systems** are normally adversely affected by variations from the standard. Most variations, however, arise as a result of the way in which the *IAD*'s processes have been designed to operate. *TQM*, therefore, seeks to improve systems and the quality of their outputs on a continuous basis. Here, the principle applies that committed employees will do a good job if the work process permits it (Jeffords *et al.*, 1994:16). Furthermore, committed and empowered employees — with a process view and a mission to add value — are motivated to continuously look for ways to improve their work processes (Julien & Lampe, 1993b:68). They would rather build quality into the internal auditing process than follow up on client dissatisfaction afterwards. In other words, it is a matter of pride.

Jeffords *et al.* (1994:16-17) cited that since *quality* is difficult to define in the abstract, the underlining principle of *TQM* is that it lets the client define quality in his own terms. By knowing and focusing on client requirements, the *IAD* can design its management and quality assurance and control systems in such a way that client satisfaction is monitored on an on-going basis. This will allow the *IAD* to make continuous quality improvements to its processes which, in turn, will enable the department to provide the quality of services expected by its clients.

2.5.2.4 *Process of TQM*

A typical *TQM* program combines four interrelated phases: Quality planning, quality control, continuous quality improvement and an all encompassing quality review loop.

The purpose, contents, and elements of each of the four phases of the *TQM* program are, in summarised form, as follows [compiled mainly from the publications by Edosomwan (1991:24-26); Edosomwan and Savage-Moore (1991:22-24); Hill (1992:5-7); Hogan (1994:3-14); and Jeffords *et al.* (1994:16-21)]:

(a) The quality planning phase

The main objectives of the quality planning and organising phase are to:

- Produce a *vision* and *mission statement* for the *IAD*.
- Develop a *shared values statement* that contains the specific components of the *TQM* program to be implemented.
- Build into the design of the *IAD*'s processes and services those special features that will meet clients' needs and expectations.
- Train all the *IAD*'s employees in the concepts, principles and functioning of the *TQM* process.

In order to accomplish the objectives of this phase, the following eight steps should be followed:

- **Step 1** — Obtain input (via questionnaires and/or personal interviews) from all the *IAD*'s main clients for the development of a *vision* and *mission statement*.
- **Step 2** — With the *vision* and *mission statements* as a basis and long-term goal, develop a *shared values statement* that is acceptable to all parties involved with the *IAD*. This statement basically consists of a set of principles, beliefs and behaviours that define and shape the *IAD*'s interaction with its main clients on a day-to-day basis. It also describes the *IAD*'s various performance and quality criteria together with their standards. In other words, the *shared values statement* contains all the components of the *TQM* program.
- **Step 3** — Identify the outputs of all the internal auditing function's main or critical *production* processes. Process outputs can be defined as the product or service that the internal auditor produces as part of his job. Outputs include the product that is passed on to the next person in the work process, whether in final form or not.
- **Step 4** — Once the outputs of the main production processes have been documented, the next step is to identify the recipient (or user) of each output. For the purposes of *TQM* the user is defined as the **next** person or group in the internal auditing process who receives the internal auditor's work and acts on it. It is important to realise that there may also be secondary users, beyond the **next** in the work process, who receive or make use of the output. In addition, every output has an end user or client — that is, the final recipient who makes use of the service/product.
- **Step 5** — Determine the requirements (needs, wants, and demands) of each internal (within the *IAD*) and external (within the organisation) client in respect of the output he receives.

This is a crucial step for quality improvement and the more specific the client's requirements, the better. A proper and complete list of requirements should address all the important characteristics of the output — such as format, quantity, timeliness, accuracy, cost, and completeness (i.e. the required standards and quality acceptance criteria).

- **Step 6** — Once the various clients' requirements are known, they must be translated into process specifications.

These specifications basically consist of detailed descriptions of the outputs in the *IAD*'s own terminology. It is essential that the specifications must not only be realistic and achievable, but also objective and measurable.

- **Step 7** — The next step in the program requires from the *IAD* to identify and describe each phase in its main work processes along with systematic plans for measuring each activity in those processes. In this case the term *measurement* refers to the collection of data about the quality of the output.

It is essential that measurements of the work process should be derived from client requirements. Measurements should also include both *in-process measures* (to provide information about output as it is being produced) and *evaluation measures* (to provide information about how well the output satisfies client requirements).

- **Step 8** — Develop and implement adequate *TQM* training programs for all the *IAD*'s employees.

To summarise, the first phase of the *TQM* program is primarily aimed at setting and gearing up the *IAD* to be quality oriented and to ultimately produce on a continuous basis the quality of services expected by its clients.

(b) **The quality control phase**

The quality control phase in the *TQM* program basically involves:

- Letting the planned systems, procedures and processes run in order to establish their stability.
- Ensuring that available departmental resources are properly allocated and utilised to optimum levels.
- Ensuring that plans, policies and procedures are followed. This can be achieved through proper internal supervision when carried out in accordance with the guidelines provided in the *IIA*'s quality assurance program.
- Monitoring results achieved and rectifying deviations from the standard immediately. In-process measures permit evaluation of output as each major activity in the work process is completed. If a problem arises, a work team immediately shifts into a problem-solving mode. If no problems are encountered, the output is completed and delivered to the client.
- Identifying areas or processes within the *IAD* that may require additional attention for possible further improvement.

Effective quality control also requires that the following actions be carried out:

- Introduce a system of periodic internal, peer and external reviews of the *IAD*'s activities in line with the *IIA*'s proposed quality assurance program. The main objectives are to measure and evaluate the *IAD*'s audit methodologies, working standards, quality of services and overall professionalism against the *IIA*'s various *Standards*, the *IAD*'s charter, its *vision* and *mission statement*, as well as its *shared values statement* and any other appropriate standards.

- Involve the *IAD*'s clients and auditees in the department's *TQM* endeavours to ensure that products and services provided to them are exactly what they need and expect. Cross-functional teams could be formed for this purpose.
- Ensure that audit reports and other outputs to clients are on time, using modern presentation skills and styles to capture their attention and to deliver a clear unequivocal message of final product quality.

(c) **The quality improvement phase**

The quality improvement phase of the *TQM* program involves:

- Providing continuous process improvement training to all the *IAD*'s employees.
- Recognising opportunities for quality improvement (as identified during the previous phase), seizing on them and enhancing the *IAD*'s processes, procedures, standards, and training programs.
- Considering and analysing all data collected via all forms of departmental review. Any lessons learned, or proposals for further quality improvements received from staff members, clients, auditees, peers or independent auditors/consultants (via the external review process) must be analysed, evaluated, and implemented where feasible.

No matter how perfect the output, there will always be room for improvement. The purpose of this phase of the *TQM* program, therefore, is to search for ways to improve the existing internal auditing processes.

(d) **The quality loop phase**

The *quality loop* is a series of continuous review and testing actions beginning and

ending with market research. A complete list of the activities within the quality loop is as follows (SABS, 1987:3):

- Market research
- Design/specification of services and products
- Recruitment of staff and procurement of assets and technology
- Process planning and development
- Production (i.e. carrying out the actual audit)
- Inspection and quality control (i.e. supervision and review)
- Packaging (i.e. format and contents of reports and presentation)
- Sales and distribution (i.e. recovering departmental costs from clients)
- Technical assistance and maintenance (i.e. the teaching, guidance and *hand-holding* of the auditee, as well as following-up during and after implementation of audit recommendations).

The more important activities within the quality loop phase are the following (Peters, 1992:16-17):

- ***Market research*** — This activity involves the continuous monitoring of the *IAD's* audit environment, determining client needs, and surveying client satisfaction with the products and services of the *IAD*.

It is also important to continuously monitor the internal and external business environments of the organisation for trends, possible risks, and new developments so that the *IAD* can pro-actively respond thereto when and where necessary — thereby adding more value (and *more quality*) to the department's services.

- ***Process planning and development*** — The purpose of this activity is to regularly review all documented processes, activities and controls (both administrative and technical) in the *system of internal auditing*. This review process should be conducted against data collected via the market research activity and any other available and relevant information. The objectives

being to confirm the relevance and currency of the *system of internal auditing* and to ensure that all documentation (in respect of structures, job descriptions, policies, procedures, standards, measurement criteria, etc.) are up-to-date, sufficient, and properly maintained. Where necessary plans and documentation must be adapted, new ideas brought in, and identified weaknesses corrected.

- **Production review** — The purpose here is to review the actual functioning of all those planned and documented processes and activities which contribute directly to the quality of the *IAD's* outputs. This is done on a broad basis and at a high level to ensure that the *TQM* program is functioning as intended.

This review activity will include the review of systems and controls in respect of technology used, project management, resource allocation, employee performance monitoring and measurement, as well as the evaluation of the adequacy of training programs — to name a few.

- **Packaging** — For internal auditing, this means reporting — both in written and oral format. Available new technology should be investigated for possible use in enhancing the quality of the final product. The main purpose of this activity is to ensure that the *IAD's* reports and presentations are in line with client expectations and that they are a true reflection of the time, dedication and effort that were invested in their production.

In summary, the quality loop phase is meant to answer questions such as: Can the output be produced more efficiently? Can the measurement system be improved? Can client requirements be exceeded in the future? Can the processes be made more cost-effective?

2.5.3 Conclusion

TQM, as suggested in above discussions, does not mean that the *IAD* must devise totally new processes for conducting an audit, nor does it mean that new standards for the professional conduct of internal auditing must be developed. It merely aims to change the internal auditor's general perception that compliance with the *IIA*'s various *Standards* (as well as all the other standards that may be applicable to a specific *IAD*) will automatically satisfy the needs, wants and demands of their clients. In other words, *TQM* aims to make the internal auditing function's professional standards and guidelines a means-to-an-end, and not an end in itself. The end must always be tangible proof of client satisfaction with the services provided by the *IAD* when such services are measured against the clients' expectations. This can best be achieved by infusing the philosophy and principles of *TQM* — together with the high professional standards provided by the *IIA* — into the daily activities and processes of the *IAD*.

2.6 QUALITY CRITERIA

In order to ensure that the *IAD* truly satisfies the needs and expectations of its main clients the *DIA* must — as mentioned under the discussion of *TQM* above — first ensure that he knows what his clients need and expect from the department. In other words, the *DIA* must, as a first step to designing and implementing a quality assurance/management program, determine where he should concentrate his quality assurance efforts to ensure that his main clients will judge and perceive the *IAD* as providing a high quality and value-added service to the organisation as a whole.

Measurement (as discussed in section 2.3 above) is a logical tool for determining what quality criteria are important to the *IAD*'s main clients, for if it can be measured it can also be managed. But the key is what to measure. Far too often organisations measure or ask the wrong things from their clients and as a result can end up spending vast amounts of time, effort and energy trying to improve things which are not important to the client. And if it is not important to the client, it's a waste, for after all the client is the ultimate — if not the sole — judge of the quality of services the organisation delivers.

A number of studies have already been conducted by various researchers [including Burnaby *et al.* (1994); Oliverio and Newman (1993); Paape (1993); Kalbers (1992); Huston (1989); Tiessen and Barrett (1989); Lampe and Sutton (1991); Braiotta (1981); and Albrechts *et al.* (1988)] to establish what the *IAD*'s clients regard as the most important quality criteria in evaluating or assessing the quality of internal auditing services. It is for this reason that the author has decided that it will be counterproductive to conduct a totally new survey within the research environment merely to determine such quality criteria.

The main objective of this part of the study, therefore, is — through making use of available literature rather than conducting a new survey — to identify those quality criteria most frequently used by the *IAD*'s main clients (i.e. *the audit committee* and *senior management*) in evaluating/assessing the quality of the department's products and services.

2.6.1 The audit committee

The audit committee — being that client who is the least in direct contact with, or involved in, the day-to-day activities of the *IAD* — has much broader and general expectations of the internal auditing function than any of the department's other clients. The audit committee's overall view and evaluation of the *IAD*, therefore, are mainly shaped by feedback received from senior operating managers and other people who are in close and regular contact with the *IAD*. However, Kasperek (1989:96) — largely supported in a later publication by Steel (1993) — writes that the audit committee's (or executive management for that matter) confidence, recognition, and support for the internal auditing function will only be forthcoming (earned) if a perceived excellent level of performance has been achieved over a period of time.

Kasperek (1989:96) states that for the *IAD* to achieve — and be perceived to have achieved — an excellent level of performance, requires that the audit committee must be convinced of:

- ***Appropriate leadership*** — This acceptance criterion refers to the audit committee's general expectation that the *IAD* must have proper and demonstrated professional standards, policies and procedures in respect of

audit methodologies and processes, the selection, training and development of internal auditing staff, as well as motivation, direction, delegation and supervision. In other words, this criterion basically has to do with the *IAD*'s general competency and overall professionalism.

[It is interesting to note that Reinstein and Farragher (1985:42) have found that the *IAD* can improve its overall professional image substantially through encouraging its employees to obtain the CIA (*Certified Internal Auditor*) qualification as soon as possible after joining the *IAD*, regardless of any other qualification they may possess.]

- ***Use of modern audit techniques*** — This criterion refers to the audit committee's expectation that the *IAD* should utilise modern internal auditing techniques and tools (mainly computers) to aid in the performance of their activities in an effective and efficient manner.
- ***Impact audit coverage*** — This criterion refers to the audit committee's requirements and expectations that the *IAD* must focus its auditing efforts on the really important and high-risk areas within the organisation in a most innovative manner. This basically means that the audit committee is looking towards the *IAD* for a payback on investment, not necessarily in terms of Rands and cents, but more in terms of assurance against surprises and protection against theft, fraud, irregularities and other malpractices.
- ***A cooperative audit approach*** — This criterion refers to the general way in which the audit committee expects the *IAD* to cooperate with operating management and the auditee. More specifically it refers to the audit committee's expectation of close cooperation between the internal and external auditors in order to maximise the benefits to be gained from the total audit effort.

The following specific quality criteria/measures can be added to the above-mentioned broad issues identified by Kasperek, namely:

- The audit committee expects a large percentage of an *IAD*'s available project

time to be spent on traditional audit activities, such as attesting and ensuring compliance with company policies, procedures, programs and controls (Horn, 1992:33).

- The audit committee expects to be assured — directly or indirectly — that the *IAD* (Huston, 1989:42):
 - is cost effective;
 - that its employees are objective; and
 - is carrying out its work independently from the activities being audited.

2.6.2 Senior management

Lawrence and Mann (1993:58) — supported by Treacy and Wiersema (1993:40-42) — point out that research work done by them had shown that senior managers specifically value client intimacy, operational excellence, and services leadership. These terms are explicated as follows:

- ***Client intimacy*** — Demands an organisational focus on service quality and distribution from the *IAD*. Here the attitude or image portrayed by the *IAD*'s staff plays an important role — it could either be that of business associates (the most valued), business consultants, policemen, teachers, or prosecuting attorneys (the least valued).
- ***Operational excellence*** — Requires an operational focus on efficiency, reliability and a consistently high quality of service.
- ***Services leadership*** — Expectation for the *IAD* to assist senior management through innovative services, to better manage the assets entrusted to them, minimise risk, and maximise returns.

In another study, conducted by Holley *et al.* (1989:29-30) and largely confirmed later by Hogan (1994:3), it was found that the undermentioned criteria could also play a significant role as to how senior managers (normally via feedback received from their subordinates — usually the auditees) perceive the value and quality of the *IAD*'s services. Senior managers want to know whether or not the:

- Purpose and scope of the audit have been explained to the auditee prior to the start of the audit.
- Auditees were asked for suggestions on areas to be covered by the audit.
- Internal auditors obtained the auditees' views on audit findings during the audit.
- Internal auditors follow up to determine whether corrective actions were implemented in respect of reported system or control weaknesses.
- Internal auditors were perceived to be sufficiently knowledgeable and objective to conduct a quality and value-added audit in the area concerned.
- Final audit report addressed the audit objectives and scope as agreed upon before the audit.
- Audit recommendations were perceived to be practical, realistic and useful for improving operations in the area audited.
- Results of the audit were discussed with senior management and the auditee before the final report was issued.
- Final audit report clearly presents the facts and results of the audit.

For obvious reasons it is, nevertheless, interesting to note how interlinked the audit committee's and senior management's quality acceptance criteria are.

2.6.3 Common quality criteria

In a comprehensive study conducted by Albrecht *et al.* (1988) fifteen criteria were identified as being used most frequently by an *IAD*'s clients to evaluate/assess the effectiveness (or quality for that matter) of such a department. The fifteen criteria, in ranked order of importance, are (Albrecht *et al.*, 1988:47):

1. Reasonable and meaningful audit findings and recommendations
2. The auditee's response to and feedback on the audit
3. Displayed and perceived professionalism of the *IAD*
4. The *IAD*'s adherence to its audit plans (schedules)
5. Absence of surprises contained in the audit reports
6. The cost-effectiveness of the *IAD*
7. The continuous development of the *IAD*'s people
8. External auditor's evaluation of the *IAD*
9. Operating management's feedback on the *IAD*
10. Number of requests for ad hoc assignments received by the *IAD*
11. The contents and quality of the *DIA*'s report to the audit committee
12. The audit committee's overall evaluation of the *IAD*
13. Quality of the *IAD*'s working papers
14. Results of the internal review conducted on and by the *IAD*
15. Peer feedback on the *IAD*

In a later independent study carried out by Peacock and Pelfrey (1991) eleven definitions of productivity (quality), similar to the fifteen criteria identified by Albrecht, were developed by the study participants. Lampe and Sutton (1991) also conducted a similar study and the quality criteria identified by the Albrecht study again featured in their list of quality criteria identified as being particularly important to the *IAD*'s clients and own staff alike.

The above-mentioned two studies, together with the results of the author's own literature study (i.e. comparing the contents of the preceding two sub-sections with the above fifteen common criteria), are regarded as sufficient confirmation that the quality criteria identified by the Albrecht study could be accepted as being valid and applicable to most internal auditing departments. Albrecht's fifteen criteria, therefore, are also accepted as a valid summary of the preceding two sub-sections' contents and an acceptable **departure point** for the field research of this study (as described in the next chapter).

2.6.4 Conclusion

Considering the above-mentioned fifteen common quality criteria most often used by the *IAD*'s main clients, it should be obvious that any attempt by the *DIA* to achieve quality improvements (whether real or perceived) in all of them at the same time, will not only require more than adequate resources, but will also require a major and long-term commitment and effort from all the *IAD*'s personnel.

However, if the *DIA* could reduce the number of issues to attend to by identifying only the most **critical** quality criteria applicable to his main clients, and work out how a change in one or more of them would impact on the rest, he could then determine where he should concentrate his efforts within the *IAD*. This would then enable him to improve the quality of the department's products and services to the maximum with the limited resources available to the him — something which the study aims to achieve.

2.7 SUMMARY

With profit margins generally being under pressure and the trend to outsource internal auditing services that do not add value to the organisation, *IADs* must continuously look for new and innovative ways to improve their services.

The basic message throughout this chapter was that the *IAD* can only expect to survive if the department's services are accepted by its main clients. The focus of this chapter, therefore,

was on providing the reader with a basic insight into the main concepts and elements of quality in general; client satisfaction and the measuring thereof; quality assurance; quality assurance/management programs; and those quality criteria most often used by an *IAD*'s main clients to evaluate/assess the quality of its products and services. It was also pointed out in this chapter that a *DIA* who wishes or plans to implement a quality assurance program for his department, should have a thorough knowledge and understanding of all the discussed issues if he wants a fair chance of making a success of such a program.

However, merely knowing and understanding the issues discussed in this chapter is not enough. With limited resources at his disposal the *DIA* should want more than just a fair chance of achieving the objectives of a quality assurance/management program. The remainder of this study, therefore, proposes a program (i.e. a plan or procedure of achieving an objective) that could be used by the *DIA* to substantially increase his chances of achieving the objectives of a quality assurance/management program within a framework of limited resources.

To conclude this general literature study on quality assurance, a few remarks from a well-known expert in the field of quality assurance/management will be appropriate. Crosby (1988:34-35), summarising what quality is all about, cited that if managers (including the *DIA*) want to improve the quality of their services to clients, they have to get serious about *prevention*. This means that everyone in the organisation (in this case the *IAD*) has to understand quality in the same way, and management has to be the example. Management has to know and practise, what Crosby calls, the *Four Absolutes of Quality Management*, viz:

- Quality means conformance to clients' requirements. All the actions necessary to run the organisation (or department), produce the service, manage the finances, and deal with the client must be met as agreed. If managers want people to *do it right the first time*, they have to tell everyone clearly what *it* is.
- Quality comes from prevention. Vaccination is the way to prevent disease, and the same concept works in organisations. Training, discipline, example, leadership - all these and more - produce prevention.
- The aim of any quality performance standard must be *Zero Defects* (or defect-free). This is a clear way of saying *conformance to requirements*.
- The measurement of quality is the price of non-conformance.

CHAPTER THREE

STUDY ENVIRONMENT, METHODOLOGY AND RESEARCH TECHNIQUES USED

3.1 INTRODUCTION

The purpose of this chapter is to familiarise the reader with the study field (environment) and scope, as well as the research methodology used and the various statistical and other techniques applied to achieve the study objectives.

The statistical and other techniques (e.g. linear programming) used in this study will not be discussed in detail since such detail is freely available in numerous textbooks.

3.2 RESEARCH ENVIRONMENT

This study, as has been pointed out in chapter one, was initiated to provide an answer to a practical problem as experienced by the author (in his capacity as head of department of one of the larger internal auditing departments in the country) in his own work environment. The following is a brief description of this environment.

3.2.1 The Anglo American Corporation's Gold Division

AAC controls and/or manages numerous companies listed on the JSE (Johannesburg Stock Exchange) which have many diversified investments and business interests throughout South Africa and overseas. A major portion of AAC's assets is invested in various mining operations. These mining operations are grouped into so-called *Divisions* (e.g. Gold and Uranium, Diamonds, Coal, etc.), each of which is headed by its own executive management

team at AAC's head office in Johannesburg. A Division comprises a number of separate companies which — mainly for geographical reasons — are grouped together to form various *Regions*.

AAC's Gold and Uranium Division (hereafter referred to as the Division) — i.e. this study's research field or environment — consists of four such Regions, namely the Freegold, Vaal Reefs, West Rand, and East Rand Regions — listed in sequence in terms of size.

The Division's executive management team consists of the:

- Chairman
- Managing Director
- Financial Director
- Manpower Director

(These four directors hold the highest managerial positions in the Division and — together with all *GIA*'s senior managers — also form the so-called *Divisional Audit Committee* to whom *GIA* ultimately reports.)

Each of the four Regions also has its own executive management team consisting of the:

- Regional General Manager (reporting to the Managing Director at head office)
- Mine Managers (the number of mine managers depends on the number of shafts in a specific Region)
- Manager Finance and Administration
- Manager Engineering
- Manager Manpower Resources
- Manager Metallurgy

(The regional executive management teams, in turn, also form a so-called *Regional Audit*

Committee on each Region to which *GIA* reports on a quarterly basis.)

The four Regions are largely self-sufficient with regard to all the necessary and basic services and infrastructures to support the efficient, effective and economical mining and extraction of gold and uranium. However, due to economy of scale considerations, certain specialist services are provided to the Regions via independent services organisations which operate on a Divisional basis. These services include:

- Computer technology and mainframe computer services
- Exploration services
- Taxation advice and consultation services
- Mining and engineering research and development services
- Internal auditing services

These services organisations, or departments, are independent from one another and from the Regions. They also have their own identity and management and report directly to one or other of the four directors at head office.

The internal auditing function referred to above — known as *Gold Internal Audit* — provides internal auditing services to not only the four Regions, but also to the various independent services organisations in the Division.

It is the above briefly described Division, with its four Regions and various independent services organisations, that forms the research field or environment of this study.

3.2.2 Gold Internal Audit

The internal auditing function within the Division will be introduced to the reader via a brief discussion of the department's objectives and scope, charter, basic structures, reporting lines, clients and finally, services.

3.2.2.1 *Objectives and scope of work*

As a service to all managers throughout the Division, the directors established the internal auditing function some seventeen years ago to operate as an independent body with the main responsibility to assist line management in the effective discharge of their managerial duties by:

- Evaluating the effectiveness, efficiency and economy of the financial and operating plans, policies, procedures, systems, programs and internal controls.
- Furnishing management with analyses, appraisals, recommendations, counsel and management information concerning the adequacy of such plans, policies, procedures, systems, programs and internal controls reviewed.

In order to fulfil its responsibilities, and without going into detail, the scope and objectives of *GIA* can be summarised by saying that it is the department's function to ensure:

- The reliability and integrity of management information produced via the various organisational systems.
- That the Division's companies and operations comply with policies, plans, procedures, laws and regulations.
- That assets are properly safeguarded against theft and misappropriation.
- The economical, effective and efficient use of resources.
- The accomplishment of established organisational objectives and goals for operations or programs.

3.2.2.2 *GIA's charter*

To assist *GIA* to fulfil its responsibilities effectively and efficiently, the directors produced

and issued a charter for the *IAD* that not only spells out and regulates the relationships between *GIA* and its environment, but also the way in which the department should conduct its administrative activities and fulfil its audit responsibilities. The charter basically deals with issues such as *GIA*'s:

- Authority
- Independence
- Co-operation with other departments and the external auditors
- Funding
- Scope and objectives of work
- Audit methodology
- Reporting channels

3.2.2.3 *Basic structures*

GIA currently has 37 employees of which 32 are operational internal auditors. These people are divided into five teams situated in the Division as follows:

- Freegold Region : 16 people
- Vaal Reefs Region : 10 people
- West Rand Region : 8 people
- East Rand Region : 2 people
- Head office : 1 person

Each of *GIA*'s regional offices is headed by a *Regional Audit Manager* who reports to the *Divisional Audit Manager* situated at the Division's head office in Johannesburg.

3.2.2.4 *Reporting lines*

As *GLA* was established by the Division's directors the department, it therefore ultimately reports to and is accountable to them. *GLA* reports **administratively** via the *Divisional Audit Manager* on a day-to-day basis to the Financial Director and **functionally** to the *Divisional Audit Committee* on a quarterly basis. The *Divisional Audit Manager* also has direct and unrestricted access to the Chairman and all other members of the *Divisional Audit Committee*.

Although *GLA*'s charter states that regional line management is not responsible or accountable for any of *GLA*'s operational or administrative activities, there is, nevertheless, a close working relationship between the department's regional audit teams and regional line management. To regulate this interaction between *GLA* and line management, official forums — i.e. quarterly *Regional Audit Committee* meetings — were established. These forums (which are attended by the *Divisional Audit Manager*) provide a *protected* environment at which *GLA* and regional executive management meet to discuss audit projects and other related internal auditing matters.

3.2.2.5 *Clients*

Internal audit projects and special or ad-hoc investigations are always conducted on behalf of or for the benefit of someone outside *GLA*. Such projects can be initiated by *GLA*'s own personnel as well as by a number of client sources. The client-initiated projects frequently come from:

- The various audit committees
- Executive management at Divisional and Regional level
- Other line managers at various levels in the organisation

To become *GLA*'s client (i.e. the person or persons to whom *GLA* will address its final audit report), and before an ad hoc request for audit services will be carried out, the following prerequisites must be met, viz:

- The person requesting the audit must be employed by the Division.

- The request must be within the ambit of *GIA*'s services.
- The request for audit services must be justified in terms of potential risk or loss to the organisation.
- *GIA* must have the necessary resources available to carry out the request.

Few employees in or below the lower management echelons ever request *GIA* to conduct an audit within his or her immediate area of responsibility. This does not, however, mean that such a person's responsibility area will never be audited. Someone of higher authority in the chain of command may request such an audit, or *GIA* could do so of its own initiative. The only difference then is that the person so audited becomes an *auditee* and not a client to *GIA*. Put another way, the higher up the organisational chart, the greater the possibility of a *client/auditor* relationship, i.e. requests normally come from higher level managers. On the other hand, the lower down the organisational chart the greater the probability of an *auditee/auditor* relationship, i.e. where the *auditee* is responsible for the activities being audited.

3.2.2.6 *Services*

The specific type and standard of services expected from *GIA* are comprehensively dealt with in the department's charter. In essence, it is expected from *GIA* to provide its clients with a quality management support and expert advisory service which will assist them in fulfilling their managerial responsibilities more efficiently and effectively to the benefit of the organisation as a whole.

The actual form and type of internal auditing services provided to clients vary widely depending on the position of the client in the Division and his specific responsibilities, needs or concerns. In addition, internal auditing services could be rendered in any one or more of the following discipline areas within the Division:

- Technical
- Commercial

- Financial
- Manpower
- Accounting
- Security
- Managerial

Typical internal auditing services provided to clients throughout the Division on a regular basis include:

- Reviewing financial or operational activities with the emphasis on determining the efficiency, effectiveness and economy of such activities and functions (i.e. *operational auditing*).
- Assessing whether line employees are complying with laid-down policies, procedures, business practices, laws, regulations, and generally accepted accounting principles (i.e. *compliance auditing*).
- Investigating possible or alleged fraud and other malpractices and/or irregularities (i.e. *detection auditing*).
- Assessing the adequacy, efficiency and effectiveness of existing policies, procedures and internal controls (i.e. *efficiency auditing*).
- Monitoring specific business activities for trends which could indicate that things are going wrong, e.g. overtime and bonus payments, feeding costs per employee, fuel consumption, store issued, etc. (i.e. *preventative auditing*).
- Reviewing contractor activities and compliance with the terms and conditions of agreements, ensuring that the client is only paying for services and goods actually received. This often includes investigating the integrity, financial stability, competence, and track record of suppliers and contractors (i.e. *investigative auditing*).

- Reviewing the accuracy and level of confidence the client can place on financial transactions, manual or computerised records, as well as management information produced (i.e. *reliance auditing*).
- Assessing the cost-effectiveness of contracts, operations and functions or whether resources are being acquired and utilised in the most efficient and economic manner (i.e. *value for money auditing*).

The above are but a few of the many services provided by *GLA* that manifest themselves in official written reports to clients. Such reports, depending on their purpose and the level of the client, are comprehensive enough to give the client a clear understanding as to what the objectives and scope of the audit were, what was found and what the causes and effects of the findings were. Where, and if, appropriate recommendations are also made to the client as to how systems, procedures or operations could be improved to enhance their efficiency, effectiveness and economy, or how to rectify control weaknesses to reduce the risk of potential financial loss.

To summarise, *GLA* aims to provide its clients with a *total support* and *peace of mind* internal auditing service.

3.3 RESEARCH SCOPE

Due to the large number of possible clients within the research environment, it was decided to restrict the scope of the research to include only those people who, it was believed, could make a positive contribution to the study. It was, therefore, decided to include all members of the various audit committees (i.e. executive managers at Divisional and Regional level — as mentioned in sub-section 3.2.1 above), as well as those senior operating managers in all disciplines and services organisations with whom *GLA* has regular contact.

3.4 RESEARCH METHODOLOGY

The methodology used for the purposes of this study incorporated two distinct but related activities. The first activity consisted of a broad literature study of the subject matter. The second activity comprised the empirical study in the research environment described above.

The two mentioned activities are briefly described under the following two sub-headings.

3.4.1 Approach to the literature study

For the purposes of the literature study — as contained in chapter two — applicable textbooks, relevant articles and other publications were read, scrutinised and studied in order to obtain the necessary background information and theory relating to:

- Quality of products and services in general and how this impacts on the internal auditing function.
- Client satisfaction and how it can be measured.
- Quality assurance and quality assurance/management programs.
- How clients evaluate/assess the quality of an internal auditing department's services.

The last section of the literature study (i.e. how clients evaluate/assess the quality of an *IAD*'s services) was of particular interest and importance to this study. Through the use of available literature those quality factors/criteria/measures (hereafter the use of any one of these terms should be read to also include the other two) most often used by an *IAD*'s main clients (as defined in chapter one) to evaluate/assess the quality of the department's services provided to them, were identified. These identified criteria combined all that was discussed under the preceding headings in chapter two, thereby largely eliminating the necessity to conduct a totally new survey in the defined research environment in order to determine the

needs, wants, demands, utility, value, etc. of those people targeted for research purposes. The common quality criteria identified by the Albrecht *et al.* (1988:47) study, as described in sub-section 2.6.3 of chapter two, were, therefore, accepted and used as a starting point for the development of the questionnaire which was used to gather the research data required for the purposes of this study.

3.4.2 The empirical study

The empirical study itself consisted of three separate parts. The first part of the study involved the selection of the quality criteria and the design of a questionnaire through which the desired research data could be obtained. The second part consisted of an *in-house* testing of the completed questionnaire and the actual gathering of the required research data in the study environment. The third and final part of the empirical study consisted of an analysis of the gathered research data by making use of the statistical and optimisation techniques described later on in this chapter.

The first two parts of the empirical study mentioned above are discussed in the following two sub-sections under this heading while the last mentioned part is discussed separately under section 3.5 below.

3.4.2.1 *Quality criteria selected for inclusion in the questionnaire*

Once the literature study was completed, its content was informally discussed with some of *GIA*'s senior staff members in order to test the author's basic assumptions, i.e. that all the concepts and elements of quality, client satisfaction, satisfaction measurement, quality assurance, and — more specifically — that most of the Albrecht study's identified fifteen common quality criteria (see sub-section 2.6.3 of chapter two) were also relevant within the defined research environment.

The Albrecht study's fifteen common quality criteria, as well as the other quality criteria identified via the literature study (as discussed in sub-sections 2.6.1 and 2.6.2 of chapter

two), were then also presented and informally discussed with various executive and senior managers at head office and regional level.

After due consideration of the suggestions and other input received from all people consulted, it was decided — for the purpose of designing the research questionnaire — to use eleven of the Albrecht study's identified common quality criteria with minor adjustments. The reason for this decision was the recognition that two of the Albrecht study's identified common quality criteria (see sub-section 2.6.3 of chapter two), i.e criterion number 11 (*the contents and quality of the DLA's report to the audit committee*) and criterion number 12 (*the audit committee's overall evaluation of the IAD*) would not be common knowledge to most of the people targeted for research purposes. In addition, criterion number 14 (*results of the internal review conducted on and by the IAD*) and criterion number 15 (*peer feedback on the IAD*), on the other hand, refer to review activities not currently being carried out by GLA and their inclusion in the research questionnaire would, therefore, be meaningless.

In place of the four rejected common quality criteria, six *new* quality criteria — regarded as material by the majority of those consulted — were added to the remaining eleven common quality criteria for inclusion in the research questionnaire. The six *new* quality criteria (printed in *italics* in the complete list of criteria under the next sub-heading), although not part of the original fifteen common quality criteria identified by the Albrecht study, nevertheless, feature either directly or indirectly in the literature study on the subject matter as discussed in section 2.6 of chapter two.

3.4.2.2 *Design of the research questionnaire*

The seventeen chosen quality criteria were then randomly converted into short statements in such a way that everyone targeted for research purposes could recognise and understand them. In other words, the statements representing the selected quality criteria were formulated and written in the research group's own *language* and *experience sphere* in respect of their dealings with and understanding of GLA itself and its services.

The final statements representing the chosen quality criteria, together with their abbreviations (depicting the *x variable* criteria/factors as mentioned under section 3.5.2 below) — as used

later on in the study — are as follows (in random order):

1. Feedback from top management (**FMT**)
2. Feedback from auditees (**FAT**)
3. Feedback from external auditors (**FEA**)
4. Reasonable and meaningful audit findings and recommendations (**RAF**)
5. Professionalism of *GLA*'s employees (**PFE**)
6. Absence of surprises contained in audit reports (**AOS**)
7. Continuous training/development of auditing staff (**CST**)
8. *Evidence that GLA has the interest of the company at heart* (**IAH**)
9. *Demonstrated objectivity/independence by audit staff* (**DOS**)
10. *Ability to prevent/detect/report fraud, theft and other irregularities* (**PFI**)
11. *Cooperation with management* (**CWM**)
12. *Demonstrated competence of GLA's staff* (**DCS**)
13. Adherence to audit plans (**ATP**)
14. Cost-effectiveness of *GLA* (**CEF**)
15. Responsiveness to ad hoc audit requests from management (**RFM**)
16. *Savings generated by GLA* (**SGN**)
17. Overall quality of audit reports and presentations (**OVQ**)

With the above questionnaire statements completed, the actual research questionnaire itself was then designed in such a manner to facilitate the gathering of data through which the author could ultimately — by making use of statistical and other techniques — determine and measure two specific issues concerning *GLA*'s quality of services as perceived by the people included in the research scope (i.e. the research group).

The first issue was to determine whether or not, and to what extent, the research group regarded the seventeen listed quality criteria as **important** for inclusion in an official quality assurance/management program. The second issue concerned the research group's

perceptions regarding the current level of **performance** (quality) **achieved** by the department in each of the seventeen listed quality criteria.

In other words, the research questionnaire was, in essence, designed to measure the research group's satisfaction with *GLA*'s overall performance in accordance with Bailey and Pearson's *client satisfaction* model which was mentioned in sub-section 2.3.3 of chapter two, viz:

$$S_i = \sum_{j=1}^n R_{ij} W_{ij}$$

Where: R_{ij} = The reaction to factor j by individual i (i.e. the perceived level of *quality or performance achieved* in respect of each criterion)

W_{ij} = The *importance* of factor j to individual i

Two additional questions were added to the questionnaire. The purpose of the first additional question (i.e. question number 18 on the questionnaire) was to obtain an overall idea of how **important** or necessary — in general terms — the research group regarded the existence of a quality assurance program for an internal auditing function. The purpose of the second additional question (i.e. question number 19 on the questionnaire), on the other hand, was to measure how the research group perceived the current overall **quality** of the services provided to them by *GLA*. These two additional questions, together with their abbreviations (depicting the *y variable* criteria/factors as mentioned under section 3.5.2 below), are as follows:

Considering all of the above (i.e. the preceding 17 quality statements), how would you rate:

- 18. The necessity, in general terms, of a *quality assurance program*? (**IMP**)
- 19. The overall quality of *GLA*'s services to your company in particular? (**QAL**)

Furthermore, these two additional questions were also necessary for the analysis of the research data discussed in chapter four which, in short, attempts to explain overall *quality* achieved and the *importance* of the various criteria by means of an appropriate sub-set of variables (quality criteria). This is basically achieved through the use of a regression analysis technique to determine the possible relationship between each of the two additional variables

(i.e. **IMP** and **QAL**) and the other quality criteria contained in the questionnaire which relate to each of them. A more detailed discussion of this technique follows in section 3.5 below.

For the purposes of measuring the research group's perceptions in respect of the issues described above, a seven-point scale was used for each of the two parts of the questionnaire (i.e., firstly, to measure the perceived *importance* of the various quality criteria individually and a *quality assurance program* in general and, secondly, to measure the perceived *quality achieved* in respect of each quality criteria individually and *GIA* overall). A seven- point scale was decided on because it was successfully used in similar studies conducted by Krüger (1993), Miller and Doyle (1987), as well as Bruwer (1981) to measure perceptions of research groups.

The final draft research questionnaire was then issued to *GIA*'s operating staff members for completion. This was mainly done to test the clarity of the questionnaire and to determine the relevance of the selected quality criteria. From the comments received the questionnaire was enhanced and issued in final format (as contained in **Appendix 1**) to the research group for completion and return to the author for further analysis.

The returned research data (as summarised in **Appendix 2**) is analysed and discussed in chapter four.

3.5 RESEARCH TECHNIQUES APPLIED

Computer software programs, together with various statistical and other techniques, were used for the processing and analysis of the data received from the research group. Only brief descriptions, or definitions, of the tools and techniques used will be given under the following sub-headings.

More information as to the actual working of the computer programs and proof of the statistical theorems and formulae applied can be found in the literature referenced in the text.

3.5.1 Computer software

Two specific computer programs were used as aids in the processing and analysis of the research data, namely *Quattro Pro* and *SAS*.

3.5.1.1 *Quattro Pro*

Quattro Pro is a PC (Personal Computer) driven electronic spreadsheet program — similar to the well-known Lotus 1-2-3 program — with many auxiliary functions, some of which are very powerful (e.g. graphics and database functions). This program was basically only used to calculate the research group's degree of satisfaction with the services provided to them and to produce the graphics presented in this study.

The actual working, functionality and overall application capabilities of this useful PC program are comprehensively explained and discussed by Uys (1992).

3.5.1.2 *SAS*

The SAS/STAT User's Guide (1990) basically describes the *SAS* software package (program) as a powerful tool for the:

- Storage and retrieval of data
- Generation of reports from stored data
- Sorting and manipulation of data
- Writing of basic data extraction and manipulation programs
- Statistical analysis of data
- Handling of computer files

The *SAS* program is particularly powerful with regards to the statistical analysis of large

amounts of data and this facility of the package was used extensively for purposes of this study. The specific procedures used included the following:

- **LP** — This procedure is used to solve linear programming problems as well as simple and mixed *integer* programming problems. The procedure performs *parametric* programming as well as range analysis. In addition, it reports on solution sensitivity to changes in the right hand side of equations, constants and coefficients.
- **CORR** — This procedure is used to compute correlation coefficients between variables. It also computes *Pearson product-moment* and *weighted product-moment* correlations.

Correlation, as summarised by Krüger (1993:70), measures the closeness of a linear relationship between two variables. In essence, this means that if one variable, say *y*, can be expressed exactly as a linear function of another variable, say *x*, then the correlation is between 1 or -1 (depending on whether the two variables are directly related or inversely related). If a correlation of *zero* is computed between two variables, it indicates that the variables have no linear predictive ability for one another. However, if the data values are normally distributed, then a computed correlation of *zero* signifies that the variables are independent of one another.

- **RSQUARE** — This procedure, in essence, selects optimal sub-sets of independent variables (i.e. the *X variables*) in a multiple regression analysis.
- **REG** — This procedure fits linear regression models by least-squares. Through the use of various model-selection techniques, sub-sets of **independent** variables which *best* predict the dependent variable can be determined. For the purposes of this study the following four model-selection techniques were used:
 - **FORWARD** — This technique, called *forward selection*, starts with no variable factors in the model and systematically adds the various variables one-by-one until all variables are included in the model.

- **BACKWARD** — This technique, called *backward elimination*, works the other way round than is the case with FORWARD. It starts off with all the variable factors already in the model and systematically eliminates them one-by-one.
- **STEPWISE** — This technique works very similar to FORWARD. It also starts with no variables in the model and systematically adds the various variables to the model. However, with this technique some variables may again be eliminated once added to the model.
- **MAXR** — This technique attempts to maximise R^2 through forward selection and switching variables into and out of the model to determining the best one-variable model, then the best two-variable model, the best three-variable model, and so forth.

The actual working of and the theory behind the above procedures are comprehensively explained and discussed by Whitehead and Whitehead (1992).

3.5.2 Statistical techniques

Two specific statistical techniques were used for the processing and analysis of the research data, namely *correlations* and *regression*. Comprehensive explanations as to the theorems and working of the formulae applicable to these statistical techniques can be found in Steyn *et al.* (1984), Kerlinger (1986), Berenson and Levine (1986), as well as Chatterjee and Price (1977). The two mentioned techniques were also extensively used by Krüger (1993), on whose work this part of the study was largely based.

The following two sub-sections contain only brief descriptions, or basic definitions, of the two statistical techniques applied.

3.5.2.1 Correlations

Correlation analysis is used to measure the extent to which one variable is dependent on another. Put another way, this statistical technique enables the researcher to measure the strength of association (or *co-variation*) between quantitative variables. This is mainly done through the calculation of the *correlation coefficient* and the *coefficient of determination*.

The correlation coefficient

In order to determine the degree or extent of the relationship between two variables (say y and x), the correlation coefficient needs to be calculated. In other words, the correlation coefficient enables the quantification of the correlation between such variables.

The correlation coefficient can be described as the *covariance* of x and y , divided by the *standard deviation* of x , times the *standard deviation* of y . This can be depicted as follows:

$$r = \frac{C_{xy}}{S_x S_y}$$

Where: r = The correlation coefficient
 C = The covariance
 S = The standard deviation

However, the better known formula for calculating r is:

$$r = \frac{[\sum (x - \bar{x})(y - \bar{y})/n]}{[\sqrt{\sum (x - \bar{x})^2/n}] [\sqrt{\sum (y - \bar{y})^2/n}]}$$

The coefficient of determination

The *coefficient of determination* (denoted by R^2) is used to measure the proportion of variation — expressed as a percentage — that is explained by the independent variable for the regression model. This means that if the researcher wants to establish what the resulting **percentage** change in the dependent variable y would be when the independent x variables are changed, the so-called *coefficient of determination* should be calculated.

This is done by obtaining the square of the calculated value of r (i.e. the *correlation coefficient* as explained above).

3.5.2.2 Regressions

Regression analysis, in contrast to correlation analysis, is primarily used for the purpose of prediction. This is done through the use of statistical techniques known as *linear regression models*.

In this study *multiple linear regressions* — depicted by the formula below — were used for predicting the necessary changes in the dependent variable resulting from changes made to the independent variables:

$$Y = b_0 + b_1X_1 + b_2X_2 + \dots + b_kX_k$$

Where: b_0 = Y intercept
 $b_1, \dots, b_k$ = regression coefficients for $X_1, \dots, X_k$

This formula (or statistical technique) can probably be best explained through the use of an example — as applicable to this study.

Suppose a number of quality criteria/variables exist (17 in this study). For each quality criterion/variable a number (78 respondents in this case) of measurements, ranging from a

value of one to seven (received via the seven-point scale of the questionnaire), are obtained. Suppose further that one additional, or summarising, variable (e.g. **IMP** in respect of *overall importance*, or **QAL** in respect of *overall quality* respectively for the two data-sets) is added to the existing quality criteria/variables, and suppose that this additional variable is of particular concern to the researcher in as much that he needs to forecast this specific variable in terms of a linear combination with its related quality criteria/variables. The additional variable — to be forecast — is now referred to as a dependent variable (Y), while the remaining variables are referred to as independent variables ($X_1, \dots, X_{17}$), as expressed in the above formula.

However, Krüger (1993:76) points out that the problem with multiple linear regression analysis is to find appropriate values for $b_0, b_1, \dots, b_k$. Values for these coefficients must be found in such a way that the highest possible correlation between the observed values of Y (as obtained via the research questionnaires) and the forecast values of Y (indicated by Y') will be obtained. The resulting correlation coefficient between Y and Y' is called a *multiple correlation coefficient* and is denoted by $R_{yy'}$. The formulas for calculating the values of the regression coefficients, for $b_0, b_1, \dots, b_k$ — based on the least-squares method — are built into the SAS program (**REG**) used for this purpose, but can also be found in Berenson and Levin (1986:650) and the other literature mentioned earlier.

The coefficient of determination — R^2 in respect of multiple linear regressions — indicates the *percentage* variation of the dependent variable Y (i.e. **QAL** as per question 19 of the research questionnaire) as explained by the independent variables X (criteria 1 through 17 as per the research questionnaire).

3.5.3 Optimisation technique used

As a final step in the development of the proposed *quality assurance program*, the results of the multiple linear regression model — as obtained through the use of the statistical technique described in the foregoing — were refined through the use of an *optimisation* technique which was developed by Bruwer and Hattingh (1985) and tested by Krüger (1993).

The optimisation technique was used because the basic linear regression model by itself, as

described under the preceding heading, does not truly provide the researcher with sufficient or totally meaningful information regarding the research data analysed. For all practical purposes, it only tells the researcher that Y is a linear function and that the variable Y is dependent on the other $X_1, \dots, X_k$ variables.

Krüger (1993:79), however, mentions that although regression models are used for prediction, it is almost impossible to predict whether or not Y can be influenced positively by increasing all or some of the X variables with positive coefficients, and/or decreasing those X variables with negative coefficients. Krüger goes on to say that the reason why the preceding cannot be done is because there is some interdependence between the various X variables (e.g. if the *DIA* spends resources to improve, say, X_1 , it may also have an influence on, say, X_3). In other words, this interdependency between the various X variables implies that if the value of one of the X variables is changed it will more than likely have an influence on the values of one or more of the other X variables. A practical example of this interdependency of the X variables can be found in Bruwer (1981).

The earlier mentioned statistical technique — developed by Bruwer and Hattingh — for optimising a multiple linear regression model, takes the above-mentioned interdependency of the X variables into account (by making use of a linear programming model) when one needs to decide which of the X variables' values to increase to optimise the value of the Y variable. Krüger (1993:79-80), who made extensive use of the technique developed by Bruwer and Hattingh, summarised the steps to be observed when applying the optimisation technique as follows (explanations in square brackets below were added for clarity and do not form part of the original text):

- *Obtain a regression model that is satisfactory* [i.e. satisfactory R^2 — the closer to 100%, with as few as possible independent variables, the better].
- *Determine the area of experience of the regression model by identifying the convex hull* [i.e. the area of experience as obtained via the empirical study] *of the available data points*.
- *Identify the state variables* [i.e. variables not under the control of the researcher] *whose influence on the dependent variable have to be investigated*.
- *Select a specific level for this variable* [i.e. a value between 1 and 7].

- *Optimise the regression function over the area [of experience] within the convex hull where this variable is at a specific level [i.e. as selected in the preceding step]. Obtain maximum and minimum values [i.e. where the linear program is solved]. Select another level and repeat the procedure.*
- *Graph the optimum values (maximum and minimum) of the regression function against different levels of the chosen variable.*

From the above it can be seen that the development of a linear program will assist the researcher in optimising the multiple linear regression model, because optimisation problems require the calculation of a maximum or minimum value of a numerical function with a number of variables, subject to certain constraints. The development of such a linear program, based on the research data applicable to this study, is further discussed in chapter four. The work of Curwin and Slater (1991), Ho (1987) and Redelinghuis *et al.* (1989) was used for the development of the actual linear program.

3.6 SUMMARY

In this chapter the reader was introduced to the research environment and scope of the study as well as the various tools and techniques used for processing and analysing the research data. Brief descriptions as to how the quality criteria were selected and how the research questionnaire was designed, were also given. The research methodology used for the purposes of this study can be summarised as follows:

- *Step 1* — Conduct a broad literature study to obtain the necessary insight and understanding of the various terms, concepts and processes applicable to the subject matter under research.
- *Step 2* — By making use of the information obtained in the first step, design a questionnaire through which the required research data can be gathered.
- *Step 3* — As an initial step to the processing and analysis of the research data, calculate — through the use of *Quattro Pro* — the degree of client satisfaction with the internal auditing services provided to them. This is

done by applying Bailey and Pearson's *client satisfaction model*.

- **Step 4** — Through the use of a *SAS* program utility, carry out a regression analysis of the two data-sets of 17 quality criteria to determine how well they do in fact explain the two dependent variables (i.e. *importance* and *quality*). This is necessary to verify that the quality criteria selected from the literature study and taken up in the research questionnaire are in fact relevant in the chosen research environment. In other words, this step produces the correlation coefficients for both data-sets to determine how well, or poorly, the regression model fits the data.
- **Step 5** — Reduce the number of independent quality criteria contained in the regression model until a common set of criteria is obtained which *best* fit the two dependent variables.
- **Step 6** — Optimise the regression model by using the optimisation technique developed by Bruwer and Hattingh. This is done to investigate the inter-dependencies among the independent variables which will assist the researcher in identifying the critically important quality criteria within the research environment.

With the last step completed, the *DIA* will be in a position to develop a *quality assurance program* through which he could allocate his scarce resource with a high degree of confidence to those identified critically important activities of the *IAD* in the knowledge that his efforts have the highest possible chance of increasing the overall quality of his department's products and services — as perceived by the clients included in the research group.

CHAPTER FOUR

PROCESSING AND ANALYSIS OF THE RESEARCH DATA

4.1 INTRODUCTION

This chapter contains a discussion of the research data collected, processed and analysed by means of the various methods, tools and techniques described in the preceding chapter.

The research data gathered via the questionnaires is firstly described. The data is then briefly discussed at the hand of results obtained through simplistic calculation using *Quattro Pro*. The latter part of the chapter — also its main focus — consists of a discussion of the processed research data with reference to more scientific techniques described in the previous chapter (e.g. correlation and regression analysis).

4.2 RESEARCH DATA GATHERED

Research questionnaires were distributed for completion as follows:

- | | | | | | | |
|---|----------------------------|------|----|-----------|----|--------|
| • | <i>GIA's</i> own employees | Out: | 32 | Returned: | 30 | (94%) |
| • | Executive Management | Out: | 4 | Returned: | 4 | (100%) |
| • | Top Management | Out: | 25 | Returned: | 17 | (68%) |
| • | Senior Management | Out: | 40 | Returned: | 27 | (68%) |

The term *Executive Management* refers to the Divisional Audit Committee members at Head Office (see sub-section 3.2.1 of chapter three). *Top Management*, in turn, refers to the various Regional Audit Committees' members as mentioned in sub-section 3.2.1 of chapter three, while *Senior Management* refers to other senior operating managers in all disciplines and services organisations with whom *GIA* has regular contact. For the purposes of this

study these three groups, collectively, have been termed the *outside respondents* (or *management*) group. It is this group that will be focused on in the remainder of the study.

To summarise, a total of 69 questionnaires were distributed to management of which 48, or 69.5%, were duly completed and returned. The returned questionnaires have been summarised in **Appendix 2**.

4.3 INITIAL PROCESSING AND ANALYSIS OF DATA

Through the use of *Quattro Pro* (see sub-section 3.5.1.1. of chapter three) the ratings obtained for each of the quality criteria were averaged (**Appendix 3**), ranked (**Appendix 4**) and then used to calculate the two research groups' (i.e. *GLA*'s own staff and *management*) average satisfaction levels with the services provided to them by *GLA* (**Appendix 5**).

Some of the more interesting aspects of the research data, as revealed by the above mentioned elementary calculations, is briefly discussed below.

4.3.1 Overall client satisfaction

With reference to **Appendix 3**, and by looking **only** at the average ratings given to *quality* (i.e. **QAL** as per question 19 of the questionnaire — abbreviated as Q19) by management and *GLA*, namely 5.38 (or 76,86% — Table B) and 5.47 (or 78,14% — Table A) respectively, any *DIA* would probably at first glance conclude that his department was performing more than adequately, since both management and *GLA*'s own staff have indicated that they are, in general, fairly satisfied with the overall quality of *GLA*'s products and services.

However, if more sophisticated techniques are used to interpret the data the *DIA* may not be quite as satisfied as his preliminary superficial glance might indicate. By applying Bailey and Pearson's (1983:531) *client satisfaction model* (see sub-section 2.3.3 in chapter two) the overall satisfaction with the services of *GLA* is calculated to be only (see **Appendix 5**, Table A and Table B respectively):

- 61.82% in the case of all managers who completed questionnaires.
- 66.64% in the case of *GLA*'s own employees.

These percentages suggest that a further investigation of the research data is warranted, because what initially seemed to be a satisfactory overall performance (as indicated by the calculated averages only), now seems to be questionable.

To obtain some understanding as to why there are such material differences (approximately 15%) between the calculated average *quality* ratings and the calculated percentages for *client satisfaction*, the *DIA* has to investigate the average ratings for each quality criterion of both data-sets in conjunction with one another. **Appendix 4** has been prepared to facilitate this investigation and is discussed below.

4.3.2 Ranked quality criteria

With reference to **Appendix 4**, and for the sake of brevity focusing only on the *outside* (management) group's figures, some of the reasons for the inconsistency between the figures mentioned above become apparent.

For example, the following are the first eight *quality* areas (criteria) in which management perceive *GLA* to be performing best (average ratings have been converted to percentages for more clarity:

- | | |
|---|-------|
| • Cooperation with management (CWM) | 81,9% |
| • Demonstrated objectivity/independence (DOS) | 78,6% |
| • Interest of company at heart (IAH) | 76,9% |
| • Quality of reports/presentations (OVQ) | 76,4% |
| • Responsiveness to ad hoc requests (RFM) | 76,1% |
| • Demonstrated competence of staff (DCS) | 76,1% |
| • Professionalism of internal auditors (PFE) | 75,9% |
| • Reasonable and meaningful findings (RAF) | 75,0% |

The calculated combined average quality rating for the above eight areas alone is a fairly high 77%. This percentage, by itself, seems to indicate that *GIA* is performing well in close to half (47,1%) of all the quality criteria research. At face value it also indicates that the *DIA* should rather concentrate his efforts and resources on the remaining nine quality areas if he wishes to increase *GIA*'s overall quality of services.

However, if the average *quality* ratings for each of the above eight criteria are multiplied by their corresponding average *importance* ratings (as per the Bailey and Pearson model), the weighted average *client satisfaction level* for those criteria is as follows (see **Appendix 5**, Table A):

• CWM	(Quality = 81,9%	Satisfaction = 64,3%)
• DOS	(Quality = 78,6%	Satisfaction = 69,5%)
• IAH	(Quality = 76,9%	Satisfaction = 63,1%)
• OVQ	(Quality = 76,4%	Satisfaction = 61,9%)
• RFM	(Quality = 76,1%	Satisfaction = 60,5%)
• DCS	(Quality = 76,1%	Satisfaction = 71,8%)
• PFE	(Quality = 75,9%	Satisfaction = 65,0%)
• RAF	(Quality = 75,0%	Satisfaction = 67,0%)

The average *client satisfaction level* for the above eight quality areas combined is calculated at just over 65% and reflects a substantial (12%) decrease when compared to the previously calculated combined average *quality level* of 77%.

The reason for this material decrease in percentages can be attributed to what appears to be a high performance level in the wrong areas. In other words, *GIA* is perceived to perform well in areas which are apparently not all that important to its main clients. For example, the *Ability to prevent/detect fraud* (i.e. criterion number 10 on the questionnaire) is, according to **Appendix 4**, the most important quality criterion in the eyes of management. This criterion, however, does not even feature under the top eight quality performance areas listed above. In fact, it is only ranked ninth as far as perceived quality (performance) is concerned. Another criterion, *Feedback from management*, is ranked as sixth most important to management, but as far as performance is concerned, it ranks last (i.e. seventeenth).

4.3.3 Conclusion

More deductions could probably be made from a further scrutiny and consideration of the information contained in the various **Appendices** mentioned above, but without the use of more scientific analysis techniques, such deductions — and conclusions reached — will probably be suspect.

It cannot be denied that some elementary data-processing and analysis techniques (such as those used to produce the Appendices mentioned above) could provide the researcher with some basic insight as to what the research data reveal. However, the researcher (in this case the *DIA*) would not be absolutely sure that his interpretation of the results was correct, or that all the underlying facts contained in the data had in fact been revealed.

4.4 STATISTICAL PROCESSING AND ANALYSIS OF DATA

In order to increase the probability of successfully implementing a *quality assurance program* which is focused on those aspects of an *IAD*'s activities which are truly important to the department's main clients, the *DIA* has to ensure that he uses more scientifically founded data-processing and analysis techniques to reveal what elementary techniques are basically unable to do with any amount of certainty. For this purpose use has been made of correlation and regression analysis techniques which are discussed below.

4.4.1 Determining the relevance of the quality criteria researched

The first question that had to be answered was whether or not and to what extent the independent quality criteria included in the research questionnaire explained management's overall opinion as to (a) the necessity for a quality assurance program (i.e. the *importance* data-set) and (b) the overall rating they gave *GIA* for quality achieved (i.e. the *quality* data-set). In other words, the reliability of the research data had to be established in the first place.

Through the use of the *SAS* program (in particular the **REG** procedure) and the statistical techniques described in chapter three, it was found that both **IMP** (*importance*) and **QAL** (*quality*) can be written as a function of the two data-sets of 17 independent quality criteria contained in the questionnaire, viz:

$$\text{IMP} = f(X_{1(\text{IMP})}, X_{2(\text{IMP})}, \dots, X_{17(\text{IMP})}); \text{ and}$$

$$\text{QAL} = f(X_{1(\text{QAL})}, X_{2(\text{QAL})}, \dots, X_{17(\text{QAL})})$$

Where:

$$\text{IMP} = \text{The dependent variable } \textit{importance}$$

$$\text{QAL} = \text{The dependent variable } \textit{quality}$$

$$X_{i(\text{IMP})} = \text{The 17 independent variables relating to the } \textit{importance} \text{ data-set}$$

$$X_{i(\text{QAL})} = \text{The 17 independent variables relating to the } \textit{quality} \text{ data-set}$$

The complete regression equations obtained from the data supplied by the *management* group are as follows:

$$\begin{aligned} \text{IMP} = & -0,7538 + 0,2435\text{FMT} + 0,0363\text{FAT} + 0,1266\text{FEA} - \\ & 0,0605\text{RAF} + 0,1064\text{PFE} + 0,0759\text{AOS} + 0,2033\text{CST} - \\ & 0,0466\text{IAH} + 0,0970\text{DOS} - 0,1071\text{PFI} + 0,0930\text{CWM} + \\ & 0,1582\text{DCS} + 0,0614\text{ATP} - 0,0184\text{CEF} + 0,0443\text{RFM} + \\ & 0,1968\text{SGN} - 0,0213\text{OVQ} \end{aligned}$$

$$\text{with } R^2 = \underline{0,824} \text{ (or 82,4\%)}$$

and the F-test: Probability of $F > 8,29$ as observed is less than 0,0002.

$$\begin{aligned} \text{QAL} = & -0,7940 - 0,1866\text{FMT} + 0,2173\text{FAT} - 0,0118\text{FEA} + \\ & 0,3630\text{RAF} - 0,0623\text{PFE} + 0,0375\text{AOS} - 0,1984\text{CST} + \\ & 0,1041\text{IAH} + 0,3090\text{DOS} - 0,0170\text{PFI} + 0,3093\text{CWM} - \\ & 0,0922\text{DCS} + 0,1491\text{ATP} - 0,1029\text{CEF} + 0,0453\text{RFM} + \\ & 0,2292\text{SGN} + 0,0323\text{OVQ} \end{aligned}$$

$$\text{with } R^2 = \underline{0,812} \text{ (or 81,2\%)}$$

and the F-test: Probability of $F > 7,64$ as observed is less than 0,0001.

With regard to the data received from *GIA*'s own staff, the complete regression equations are as follows:

$$\begin{aligned} \text{IMP} = & -1,9012 + 0,2502\text{FMT} + 0,2207\text{FAT} - 0,1010\text{FEA} - \\ & 0,1807\text{RAF} + 0,1079\text{PFE} - 0,1361\text{AOS} + 0,4500\text{CST} + \\ & 0,1190\text{IAH} - 0,1310\text{DOS} + 0,1277\text{PFI} - 0,3521\text{CWM} + \\ & 0,2141\text{DCS} + 0,1277\text{ATP} + 0,0971\text{CEF} + 0,4108\text{RFM} - \\ & 0,1672\text{SGN} + 0,2369\text{OVQ} \end{aligned}$$

$$\text{with } R^2 = \underline{0,931} \text{ (or 93,1\%)}$$

and the F-test: Probability of $F > 9,57$ as observed is less than 0,0002.

$$\begin{aligned} \text{QAL} = & 2,0603 + 0,3234\text{FMT} - 0,2444\text{FAT} + 0,0390\text{FEA} - \\ & 0,1355\text{RAF} + 0,0853\text{PFE} + 0,1071\text{AOS} + 0,1544\text{CST} + \\ & 0,1456\text{IAH} + 0,3488\text{DOS} + 0,3090\text{PFI} - 0,0691\text{CWM} - \\ & 0,3008\text{DCS} - 0,3198\text{ATP} - 0,0169\text{CEF} - 0,1400\text{RFM} + \\ & 0,0745\text{SGN} + 0,3315\text{OVQ} \end{aligned}$$

$$\text{with } R^2 = \underline{0,637} \text{ (or 63,7\%)}$$

and the F-test: Probability of $F > 1,24$ as observed is less than 0,3578.

With reference to the above R^2 values, it can be concluded that the independent quality criteria contained in the questionnaire largely explain (or represent) the overall ratings given to *importance* and *quality* by *GIA*'s own staff and management alike. In the case of *management*, the 17 independent criteria explain no less than 82% and 81% of the overall ratings give to *importance* and *quality* respectively. From the R^2 values obtained from the data-set representing *GIA*'s own staff, it can be argued that the 17 independent criteria explain more than 93% of the overall rating given to *importance* and just over 63% of the overall rating given to *quality* achieved.

4.4.2 Reducing the number of quality criteria

The main objective of the study, as pointed out earlier, is to develop a quality assurance program (or model) which could be used by a *DIA* to assist him in increasing the overall quality of his department's products and services. Given the constraint of limited available

resources, this objective can basically only be achieved by focusing the quality assurance program on those areas and activities which, if improved, will provide the greatest return on investment — in terms of increased client satisfaction.

To achieve this objective it is necessary to reduce the number of quality criteria (areas) to be concentrated on in future to the lowest possible number. Put another way, the final quality assurance program should be as simple as possible to be of any real value to the *DIA* and his department — the more criteria (variables) to be concentrated on, the more complex and expensive the model becomes, which, in turn, could reduce the probability of achieving success.

The obvious approach for reducing the number of independent variables is to retain only those which contribute significantly to the determination of the dependent variables (i.e. *importance* and *quality*). In other words, the objective is to reduce the number of independent variables to as few as possible while keeping R^2 as high as possible for both the dependent variables.

The first step taken to reduce the number of independent variables was to construct regression models and to calculate the R^2 values (by making use of the *SAS* program's **RSQUARE** procedure) for the dependent variables when only one, two, three, and so forth until all seventeen independent variables were included in the regression models. **Figure 4.1** and **Figure 4.2** below respectively represent the results obtained through this exercise for the *importance* and *quality* data-set received from the management group.

From the information contained in the two graphs it can be seen that the R^2 values for each of the dependent variables (*importance* and *quality*) increase by negligible degrees after the seventh independent variable was added to the regression models (i.e. less than 1% in each case). This suggests that — in this study — there are basically only seven really important quality criteria (areas) that could have a material influence on management's perception as to the quality of services they receive from the *IAD* in question.

Figure 4.1 - Importance Model for Management

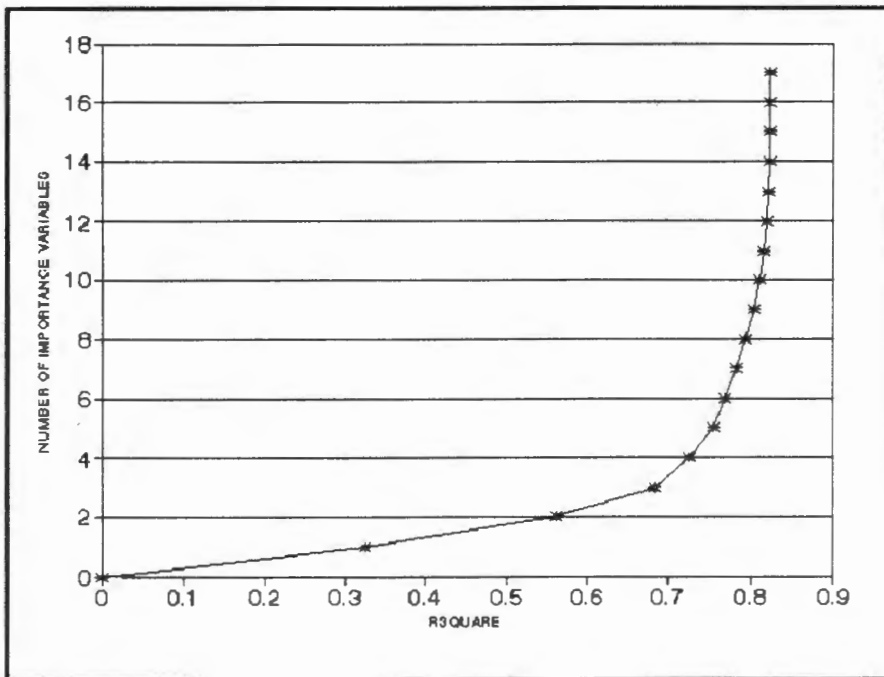
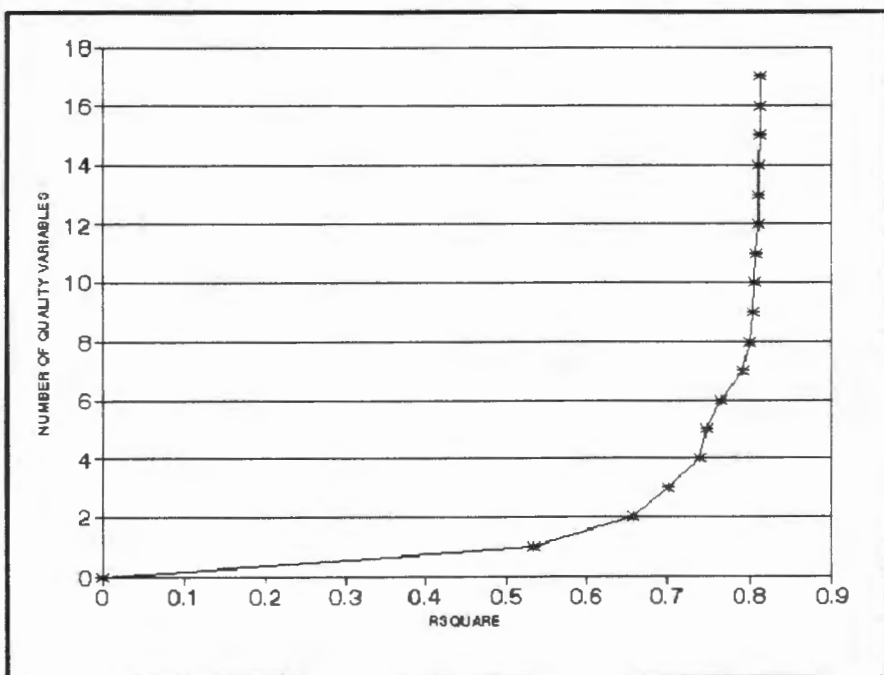


Figure 4.2 - Quality Model for Management



4.4.3 Determining the initial seven most important quality criteria

The next step in reducing the number of independent variables was to establish which seven quality criteria contribute most to the determination of the two dependent variables in each data-set.

The REG procedure's FORWARD, BACKWARD, STEPWISE and MAXR options of the SAS program (as described in sub-section 3.5.1.2 of chapter three) were used to perform the necessary calculations. Table 4.1 and Table 4.2 below respectively show the *best* sub-sets of seven independent variables which contribute most to the determination of *importance* and *quality* as obtained from the calculations made on the management group's two data-sets.

Table 4.1 - Dependent Variable = Importance (With $R^2 = 0,777$)

INDEPENDENT VARIABLE	COEFFICIENT
Y-Intercept	-0,2825
FMT	0,3299
FEA	0,0885
CST	0,2421
DOS	0,1796
PFI	-0,1087
CWM	0,1492
SGN	0,1895

Table 4.2 - Dependent Variable = Quality (With $R^2 = 0,791$)

INDEPENDENT VARIABLE	COEFFICIENT
Y-Intercept	-0,1344
FMT	-0,1652
FAT	0,2082
RAF	0,2503
CST	-0,1754
DOS	0,3027
CWM	0,3348
SGN	0,2452

The sub-set of seven independent variables contained in Table 4.1 explains at least 77% of the variation in the dependent variable **IMP** (*importance*), while those contained in Table 4.2 explain no less than 79% of the variation in the dependent variable **QAL** (*quality*). With this information available the reduced regression equation for each of the dependent variables can now be written as follows:

$$\text{IMP} = -0,2825 + 0,3299\text{FMT} + 0,0885\text{FEA} + 0,2421\text{CST} + 0,1796\text{DOS} - 0,1087\text{PFI} + 0,1492\text{CWM} + 0,1895\text{SGN}$$

$$\text{with } R^2 = \underline{0,777} \text{ (or } 77,7\%)$$

and the F-test: Probability of $F > 19,93$ as observed is less than 0,0001.

$$\text{QAL} = -0,1344 - 0,1652\text{FMT} + 0,2082\text{FAT} + 0,2503\text{RAF} - 0,1754\text{CST} + 0,3027\text{DOS} + 0,3348\text{CWM} + 0,2452\text{SGN}$$

$$\text{with } R^2 = \underline{0,791} \text{ (or } 79,1\%)$$

and the F-test: Probability of $F > 21,69$ as observed is less than 0,0001.

4.4.4 Combining the two sub-sets of independent variables

Although the two reduced regression models above are already adequate in themselves, the ultimate objective is to work with only one model so that *quality* can eventually be optimised in the knowledge that the areas concentrated on are also *important* to management. It will be counterproductive to allocate scarce resources to improve the quality of services in an area or activity of the *IAD* which is not of any real importance to those making use of such services.

In order to obtain a common set of quality criteria it was decided to reduce the independent variables as per the preceding two regression models further until they reflect a common set without dramatically decreasing the R^2 values of the two dependent variables.

4.4.4.1 Importance sub-set for management

With reference to the *importance* sub-set of seven independent variables it was decided to merely look at the coefficients of each variable (see Table 4.1 above) and to eliminate the two variables with the smallest coefficients (i.e. FEA and PFI). The effect that this decision has on the R^2 value of IMP (as calculated through the **FORWARD** option of the *SAS* program's **REG** procedure) is a decrease of only 2,2%.

To test whether the five remaining independent variables (i.e. FMT, CST, DOS, CWM and SGN) do in fact make the greatest contribution to the R^2 value of IMP, Table 4.3 below was produced by using the **RSQUARE** procedure of the *SAS* program.

Table 4.3 - *RSQUARE Analysis of Importance for Management*

NUMBER OF VARIABLES	VARIABLES IN MODEL	R^2
1	CST	0,325
2	FMT, CST	0,561
3	FMT, CST, SGN	0,683
4	FMT, CST, CWM, SGN	0,726
5	FMT, CST, DOS, CWM, SGN	0,755

To verify the validity of the five selected variables further, a correlation analysis of the *importance* data-set was also compiled. The results of this exercise are represented in Table 4.4 below.

Table 4.4 - Correlation Analysis for Importance (Management)

	IMP	FMT	FAT	FEA	RAF	PFE	AOS	CST	IAH	DOS	PFI	CWM	DCS	ATP	CEF	RFM	SGN	OVQ
IMP	1,00	0,53	0,44	0,52	0,42	0,46	0,14	0,57	0,46	0,40	0,27	0,52	0,57	0,32	0,14	0,24	0,45	0,53
FMT	0,53	1,00	0,39	0,28	0,12	0,29	-0,05	0,09	0,07	0,18	0,20	0,19	0,34	0,29	-0,07	0,04	0,09	0,32
FAT	0,44	0,39	1,00	0,37	0,23	0,21	0,07	0,24	0,08	0,20	0,18	0,25	0,31	0,21	0,18	0,03	0,06	0,29
FEA	0,52	0,28	0,38	1,00	0,35	0,20	0,00	0,32	0,26	0,42	0,42	0,27	0,24	0,03	0,07	-0,07	0,24	0,39
RAF	0,42	0,12	0,23	0,35	1,00	0,28	0,13	0,45	0,41	0,29	0,55	0,42	0,47	0,04	0,31	0,23	0,34	0,40
PFE	0,46	0,29	0,21	0,20	0,28	1,00	-0,10	0,39	0,43	0,33	0,15	0,25	0,40	0,27	0,10	0,08	0,08	0,41
AOS	0,14	-0,05	0,07	0,00	0,13	-0,10	1,00	0,05	0,05	-0,12	0,06	0,35	-0,15	0,01	-0,05	0,07	-0,02	-0,08
CST	0,57	0,09	0,24	0,32	0,45	0,39	0,05	1,00	0,60	0,31	0,13	0,39	0,44	0,13	0,12	0,39	0,12	0,39
IAH	0,46	0,07	0,08	0,26	0,41	0,43	0,05	0,60	1,00	0,16	0,12	0,51	0,34	0,25	0,31	0,41	0,26	0,31
DOS	0,40	0,18	0,20	0,42	0,29	0,33	-0,12	0,31	0,16	1,00	0,39	0,09	0,54	0,11	0,13	-0,02	0,05	0,18
PFI	0,27	0,20	0,18	0,42	0,55	0,15	0,06	0,13	0,12	0,39	1,00	0,09	0,33	-0,08	0,37	0,17	0,37	0,33
CWM	0,52	0,19	0,25	0,27	0,42	0,25	0,35	0,39	0,51	0,09	0,10	1,00	0,16	0,40	0,14	0,41	0,16	0,31
DCS	0,57	0,34	0,31	0,24	0,47	0,40	-0,15	0,44	0,34	0,54	0,33	0,16	1,00	0,17	0,15	0,06	0,29	0,51
ATP	0,32	0,29	0,21	0,03	0,04	0,27	0,09	0,13	0,25	0,11	-0,08	0,40	0,17	1,00	0,22	0,09	-0,08	-0,02
CEF	0,14	-0,07	0,18	0,07	0,31	0,09	-0,05	0,12	0,31	0,13	0,37	0,14	0,15	0,22	1,00	0,26	0,36	0,14
RFM	0,24	0,04	0,03	-0,07	0,23	0,81	0,07	0,40	0,41	-0,02	0,17	0,41	0,06	0,09	0,26	1,00	0,20	0,26
SGN	0,45	0,09	0,06	0,24	0,34	0,08	-0,02	0,12	0,26	0,05	0,37	0,16	0,29	-0,08	0,36	0,20	1,00	0,44
OVQ	0,53	0,32	0,29	0,39	0,40	0,41	-0,08	0,39	0,31	0,18	0,33	0,31	0,51	-0,02	0,15	0,26	0,44	1,00

Through scrutinising the data contained in Table 4.4 it could be seen that the five selected independent criteria that explain just over 75% (i.e. 75,5% as per Table 4.3 above) of the variation in the dependant variable IMP, are also largely independent of one another. The highest correlation is to be found between CST and CWM (i.e. $R^2 = 39\%$), and CST and DOS (i.e. $R^2 = 31\%$). These correlations, however, are low enough and should, therefore, not be a source of concern.

To conclude, an adequate regression model, explaining 75,5% of the variation in IMP (*importance*) as perceived by the managers included in the researched group, could be found by using the following five independent quality criteria:

FMT	—	<i>Feedback from top management</i>
CST	—	<i>Continuous training/development of audit staff</i>
DOS	—	<i>Demonstrated objectivity/independence by audit staff</i>
CWM	—	<i>Cooperation with management</i>
SGN	—	<i>Savings generated by GLA</i>

The complete reduced regression model for *importance* can now be written as follows:

$$\begin{aligned} \text{IMP} &= -0,7180 + 0,3392\text{FMT} + 0,2602\text{CST} + 0,1814\text{DOS} + \\ &\quad 0,1620\text{CWM} + 0,1794\text{SGN} \\ \text{with } R^2 &= \underline{0,755} \text{ (or 75,5\%)} \end{aligned}$$

and the F-test: Probability of $F > 26,02$ as observed is less than 0,0001.

4.4.4.2 *Quality sub-set for management*

With reference to the *quality* (QAL) sub-set of seven independent variables contained in Table 4.2 above, and comparing them with the final selected sub-set of five independent variables for the dependent variable *importance* (IMP) as per the last regression model above, it can be seen that if a common set of variables is required for both QAL and IMP, then the two variables FAT and RAF must be removed from the QAL regression model with seven variables.

Deleting the two variables FAT and RAF from the *best* sub-set of seven independent variables explaining QAL, has the effect of decreasing the R^2 value of QAL (as calculated through the **FORWARD** option of the SAS program's **REG** procedure) by just under 10% (i.e. from 79,1% to 69,3%).

To test whether the five remaining independent variables (i.e. FMT, CST, DOS, CWM and SGN) do in fact contribute significantly to the R^2 value of QAL, Table 4.5 below was produced by using the **RSQUARE** procedure of the SAS program. In addition, to verify the validity of including the five mentioned variables in the final QAL regression model, a correlation analysis of the *quality* data-set was done. The results of this exercise are represented in Table 4.6 below.

Table 4.5 - *RSQUARE Analysis of Quality for Management*

NUMBER OF VARIABLES	VARIABLES IN MODEL	R ²
1	RAF	0,534
2	RAF, DOS	0,657
3	RAF, DOS, CWM	0,701
4	RAF, DOS, CWM, SGN	0,740
5 (a)	FAT, RAF, DOS, CWM, SGN	0,749
5 (b)	RAF, CST, DOS, CWM, SGN	0,746
5 (c)	FMT, RAF, DOS, CWM, SGN	0,745
5 (d)	FMT, CST, DOS, CWM, SGN	0,693

Table 4.6 - Correlation Analysis for Quality (Management)

	QUAL	FMT	FAT	FEA	RAF	PFE	AOS	CST	IAH	DOS	PFI	CWM	DCS	ATP	CEF	RFM	SGN	OVQ
QUAL	1,00	0,18	0,39	0,41	0,73	0,60	0,04	0,20	0,45	0,66	0,61	0,55	0,57	0,33	0,59	0,50	0,55	0,67
FMT	0,18	1,00	0,53	0,36	0,19	0,17	0,22	-0,15	-0,05	0,18	0,31	0,29	0,12	0,32	0,13	0,24	0,17	0,15
FAT	0,40	0,53	1,00	0,56	0,35	0,24	0,33	0,21	0,01	0,19	0,44	0,35	0,24	0,23	0,21	0,24	0,13	0,21
FEA	0,41	0,36	0,56	1,00	0,37	0,41	0,42	0,25	0,24	0,34	0,42	0,28	0,29	0,42	0,33	0,26	0,24	0,22
RAF	0,73	0,19	0,35	0,37	1,00	0,64	0,02	0,25	0,43	0,48	0,64	0,36	0,52	0,15	0,73	0,32	0,58	0,64
PFE	0,60	0,17	0,24	0,41	0,64	1,00	0,14	0,29	0,50	0,68	0,55	0,40	0,61	0,23	0,58	0,43	0,41	0,65
AOS	0,04	0,22	0,33	0,42	0,02	0,14	1,00	0,22	-0,07	0,07	0,17	-0,04	0,18	0,31	-0,07	0,01	-0,02	-0,03
CST	0,20	-0,15	0,21	0,25	0,25	0,29	0,22	1,00	0,32	0,25	0,16	0,13	0,33	0,20	0,30	0,23	0,31	0,15
IAH	0,45	-0,05	0,01	0,24	0,43	0,50	-0,07	0,32	1,00	0,44	0,19	0,21	0,38	0,02	0,63	0,36	0,38	0,34
DOS	0,66	0,18	0,19	0,34	0,48	0,68	0,07	0,25	0,44	1,00	0,67	0,41	0,65	0,31	0,43	0,49	0,32	0,53
PFI	0,62	0,31	0,44	0,42	0,64	0,55	0,17	0,16	0,19	0,67	1,00	0,40	0,47	0,21	0,47	0,32	0,35	0,46
CWM	0,55	0,29	0,35	0,28	0,36	0,40	-0,04	0,13	0,21	0,42	0,40	1,00	0,42	0,30	0,32	0,52	0,02	0,49
DCS	0,57	0,12	0,24	0,29	0,52	0,61	0,18	0,33	0,38	0,65	0,47	0,42	1,00	0,43	0,35	0,40	0,35	0,59
ATP	0,33	0,32	0,23	0,42	0,15	0,23	0,31	0,20	0,02	0,31	0,21	0,30	0,43	1,00	0,14	0,28	0,19	0,25
CEF	0,59	0,13	0,21	0,33	0,73	0,58	-0,07	0,30	0,63	0,43	0,47	0,32	0,35	0,14	1,00	0,62	0,57	0,55
RFM	0,50	0,24	0,24	0,26	0,32	0,43	-0,01	0,23	0,36	0,49	0,32	0,52	0,40	0,28	0,62	1,00	0,36	0,47
SGN	0,55	0,17	0,13	0,24	0,58	0,41	-0,02	0,31	0,38	0,32	0,35	0,02	0,35	0,19	0,57	0,36	1,00	0,53
OVQ	0,67	0,15	0,21	0,22	0,64	0,65	-0,03	0,15	0,34	0,53	0,46	0,49	0,59	0,25	0,55	0,47	0,53	1,00

By examining the results of the **RSQUARE** analysis contained in Table 4.5 above, it can be argued that the *best* sub-set of five independent variables explaining almost 75% (i.e. $R^2 = 74,9\%$) of the variation in *quality* (QAL) is to be found in 5 (a). Sub-sets 5 (b) and 5 (c) also explain QAL better than the preferred sub-set in 5 (d). However, despite the fact that sub-set 5 (d) does not *best* explain the variation in QAL, it nevertheless still explains almost 70% (i.e. 69,3%) thereof and can, therefore, still be regarded as an adequate model — especially if commonality between the sub-sets for IMP and QAL is achieved.

By scrutinising the correlation analysis of QAL, as represented in Table 4.6 above, the exchange of the independent variable FAT — see sub-set 5 (a) of Table 4.5 — for the independent variable FMT — as per sub-set 5 (d) — does not seem material. The correlation analysis suggests that there is a strong correlation between the two independent variables FAT and FMT (i.e. $R^2 = 53\%$). In other words, this means that the variation in the dependent variable QAL, as explained by FAT, could almost equally well be explained by FMT. The same cannot, however, be said for the substitution of RAF for CST where the correlation is not particularly positive (i.e. $R^2 = 25\%$).

Considering the above, it can be concluded that the common sub-set of five independent variables (i.e. FMT, CST, DOS, CWM and SGN) is acceptable for the purposes of explaining the variation in the dependent variable QAL as applicable to this study.

By accepting this common sub-set of quality criteria, it now provides the final regression model for *quality* (through using the *SAS* program's **REG** procedure) which is as follows:

$$\begin{aligned} \text{QAL} &= 0,1614 - 0,0725\text{FMT} - 0,1200\text{CST} + 0,3472\text{DOS} + \\ &\quad 0,4535\text{CWM} + 0,3346\text{SGN} \\ \text{with } R^2 &= \underline{0,69,3} \text{ (or } 69,3\%) \\ \text{and the F-test: Probability of } F > 18,97 &\text{ as observed is less than } 0,0001. \end{aligned}$$

To conclude, it is this regression model for *quality* which will be optimised in chapter five. Although it is not the *best* regression model for optimising quality, the regression model nevertheless, takes full cognisance of management's perceived *importance* of the quality criteria selected for optimisation.

4.5 SUMMARY

This chapter dealt with the processing and analysis of the research data gathered via the questionnaires and concentrated mainly on the *IAD*'s main clients (i.e. managers).

Initial data analysis was done through the use of *Quattro Pro* and elementary calculations (e.g. simple average and weighted average calculations). This was done mainly to point out how misleading such calculations alone, can be. For example, if no additional or further scientific research techniques were used in this study, the conclusion would probably have been to invest time, effort and other resources in those five areas with which management was least satisfied. With reference to **Appendix 5** (Table A) the five areas selected would then have been AOS, ATP, FEA, CST and FMT. It is only CST and FMT that also feature in the final regression model for *quality*. In other words, at least 60% of the resources invested to improve the overall quality of the *IAD*'s products and services would probably have been wasted.

However, by processing and analysing the research data by means of more scientific techniques (e.g. regression and correlation analysis), a final regression model was produced which consists of five independent variables which explain 69,3% of the variation in the overall *quality* of the *IAD*'s products and services as perceived by management. Although the five independent variables in the model do not represent the *best* combination, they were, nevertheless, selected because they also represent the five most *important* quality criteria as perceived by management.

The final regression model for *quality* can now be optimised to produce a *quality assurance program*. This program can be used by the *DIA* to assist him in deciding how to obtain the maximum return on investment measured in terms of improved overall quality of services — as perceived by the *IAD*'s main clients.

Optimising the *quality model* is discussed in chapter five.

CHAPTER FIVE

OPTIMISING QUALITY

5.1 INTRODUCTION

Optimising the final linear regression model for *quality* (QAL), as developed in chapter four, is the first issue discussed in this chapter. Thereafter the results obtained from the optimisation process are used to formulate a proposed quality assurance program (or model). This program can then be used by the *DIA* to assist him with the development of strategies and action plans through which the overall quality of his department's products and services — as perceived by management — could be increased.

5.2 THE QUALITY OPTIMISATION MODEL

As mentioned in chapter three (sub-section 3.5.3), the technique developed by Bruwer and Hattingh (1985) was used to optimise the final linear regression model for *quality*. In order to apply Bruwer and Hattingh's optimisation technique the formulation of a linear programming (LP) model with an objective function and specific constraints is required. The model developed for the purposes of this study is described in sub-section 5.2.1 below.

The objective of this specific optimisation technique is to enable the researcher to interpret results produced by linear models through investigating the behaviour of the objective function (in this case *quality*) within the region of experience as defined by the convex hull of the data point. In other words, this technique gives the researcher an insight into the influence the independent variables in the linear regression model have on the dependent variable. The technique also provides the researcher with a method for investigating the interdependencies among the various independent variables in the regression model which,

Furthermore, the independent variables' regression coefficients (as obtained from the final QAL regression equation produced in chapter four) are:

$$b_0 = 0,1614$$

$$b_1 = -0,0725$$

$$b_2 = -0,1200$$

$$b_3 = 0,3472$$

$$b_4 = 0,4535$$

$$b_5 = 0,3346$$

5.2.2 Optimising the model

The LP procedure provided by the *SAS* program (as described in sub-section 3.5.1.2 of chapter three) was used to perform the optimisation process. It should be noted that parametric programming could have been used for the optimisation process, but was unnecessary as all data points were obtained from a seven-point scale. In other words, solutions for the decision variables were only required when they were on one of the seven levels of the scale. Parametric programming, which in general can give solutions for a whole range of *q*-values, was, therefore, not used in this specific case.

The optimisation process of the above LP model was carried out as follows:

- Firstly, it was decided to choose the independent variable *Savings generated by GIA* (SGN) as the state variable in constraint equation 1 above. The reasons for this decision are:
 - In general it is extremely difficult to quantify actual, or even potential savings in an area audited immediately after the audit is completed. Savings mainly accrue as a result of improved controls which are normally — if ever — only noticeable after a few months or years have passed. In addition, most savings are also intangible in nature (e.g. what is the potential loss to the company if its operations and systems of internal control are not regularly audited? What is the value of potential theft or other malpractices prevented by an internal audit?).

- Implementing internal audit recommendations is the sole responsibility of line management. *GIA*, therefore, has little — if any — control over generating any savings, whether directly or indirectly, in an area audited.
 - Most savings achieved via preplanned audits are basically accidental. There is no way for the internal auditor to know in advance that savings can be achieved in any specific area planned to be audited.
 - Savings achieved (e.g. money recovered, etc.) as a result of an audit which was specifically requested by management cannot be truly claimed as a saving generated by the *IAD* — most ad hoc audit requests are made because management already suspects that something is wrong in that area.
- Secondly, with the state variable X_{SGN} , substituted in X_p in constraint equation 1 above, the dependent variable QAL was then maximised and minimised for each possible value of q (where $q = 1, 2, \dots, 7$).

The results produced by the optimisation process were then used to produce a graph and two tables (**Figure 5.1**) depicting the maximum and minimum values for the dependent variable (QAL) when the decision variable (X_{SGN}) in constraint equation 1 above was, respectively, restricted to the value 1, 2, ..., 7. It should be noted, however, that the optimisation model does not, and cannot suggest values for any independent variables not contained in the convex hull of the data points.

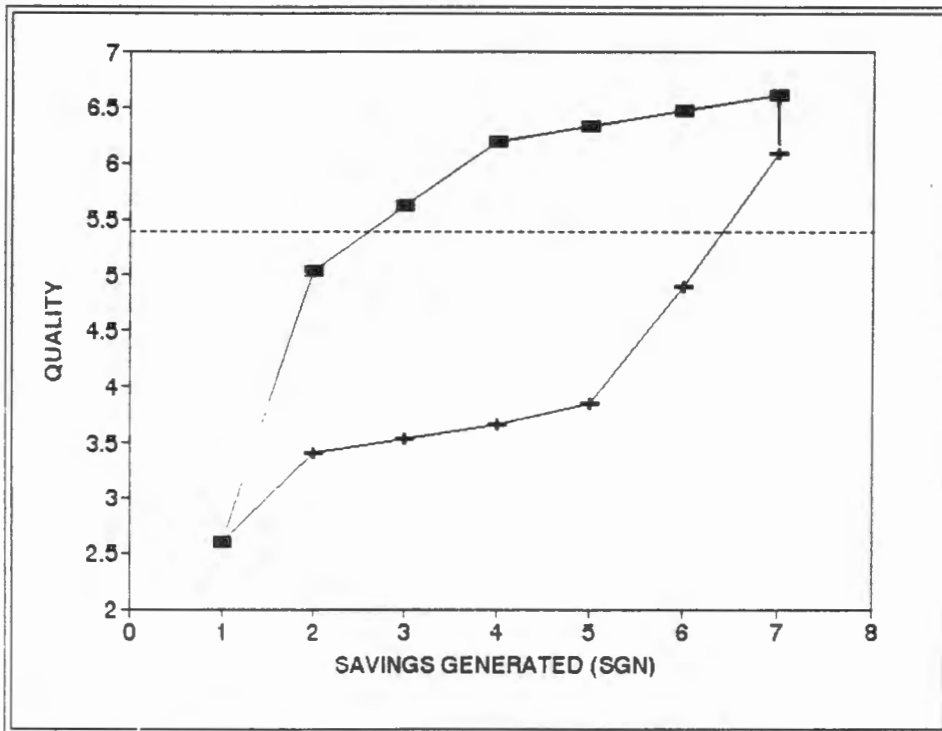
The dotted horizontal line on the graph (calculated by using *Quattro Pro*) represents the current actual mean rating (5,38) for the overall quality (QAL) achieved by *GIA* as perceived by management when rated on a seven-point scale (see **Appendix 4**, Table B).

Figure 5.1

Maximum and Minimum QAL-Values for the Independent Variable X_{SGN}

MAXIMISE QUALITY

SGN	1.00	2.00	3.00	4.00	5.00	6.00	7.00
FMT	1.50	3.00	4.50	6.00	6.00	6.00	6.00
CST	2.00	4.00	4.00	4.00	4.67	5.30	6.00
DOS	2.50	5.00	6.00	7.00	6.67	6.33	6.00
CWM	3.50	7.00	7.00	7.00	7.00	7.00	7.00
QUALITY	2.60	5.04	5.62	6.19	6.33	6.47	6.61



MINIMISE QUALITY

SGN	1.00	2.00	3.00	4.00	5.00	6.00	7.00
FMT	1.50	2.00	2.50	3.00	5.00	3.00	4.00
CST	2.00	4.00	4.00	4.00	4.00	5.00	4.00
DOS	2.50	4.00	3.50	3.00	3.00	5.00	6.00
CWM	3.50	4.00	4.00	4.00	4.00	4.00	5.00
QUALITY	2.60	3.41	3.53	3.66	3.85	4.90	6.08

5.2.3 Interpreting the results

With reference to the results produced by the quality optimisation model, as represented in the graph and tables above, the following interpretations can be made:

- The graph indicates that by assigning a specific value (q) to a decision variable (in this case X_{SGN} — also the chosen state variable) in the optimisation model, it produces a maximum and a minimum level for *overall quality* (QAL) at that specific level. For example, when X_{SGN} is restricted to a value of 3, the maximum and minimum values for QAL are 5,04 and 3,53 respectively.
- The difference between the optimum values of the dependent variable QAL, at any assigned value (1, 2, ..., 7) for the decision variable, gives the *DIA* an indication of the potential impact the remaining independent variables in the model could have on QAL. The larger the difference (represented by the total area on the graph), the larger the potential impact on QAL. The reverse, obviously, is also true. For example, with X_{SGN} restricted to a value of 4, the differential band between the optimum values is 2,53. This suggests that QAL could be influenced significantly if the values of the remaining variables were changed.
- The graph further indicates that the state variable (X_{SGN}), in general, is likely to have a material influence on management's perception as to the overall quality achieved by the *IAD*. This is clearly to be seen from the fact that the line representing the maximum levels of QAL (formed by plotting and joining the calculated values for QAL as depicted in the table headed *Maximise Quality*) is sloping upwards — indicating a continuous increase in the value of QAL at each higher level for X_{SGN} (1, 2, ..., 7). The same is also true for the minimum values of QAL. For example, QAL is at its highest level (6,61) when X_{SGN} is restricted to a value of 7. QAL is also at its lowest level (2,60) when X_{SGN} is restricted to a value of 1.

- The two tables, depicting the *maximum* and *minimum* levels for QAL when the state variable is restricted to a certain value (1, 2, ..., 7), also indicate the minimum ratings to be achieved for the remaining four independent variables in the model if the corresponding overall rating for quality in the specific column is to be achieved.

For example, **Appendix 3** (Table B) shows *GIA*'s actual average quality ratings achieved for the independent variables in the model as perceived by management to be:

-	X_{SGN}	4,71
-	X_{FMT}	4,33
-	X_{CST}	4,63
-	X_{DOS}	5,50
-	X_{CWM}	5,73

With reference to the above table headed *Maximise Quality*, it can be seen that at an average rating of 4,71 for the state variable X_{SGN} , the overall quality achieved (QAL) by the department should at least have been at a level of 6,19 — perhaps even closer to 6,33. In other words, *GIA* is currently under-performing by approximately 13% to 15% in the remaining four areas combined — i.e. X_{FMT} should be at a level of 6,00; X_{CST} is basically as already on its maximum level; X_{DOS} should be as close as possible to 7; and X_{CWM} should almost always be on a level 7 if *GIA* wishes to maximise quality while X_{SGN} is at its current level.

From the above it can be concluded that the *Maximise/Minimise Quality* tables provide the *DIA* with a good guideline as to where he should concentrate his energy and resources so as to increase *GIA*'s perceived overall quality of products and services in order to achieve maximum client satisfaction. For example, the two tables could be interpreted to suggest that:

- With X_{SGN} (*Savings generated by GIA*) perceived by management to be at an average level of 1, the *DIA* would find it difficult to develop strategies for the remaining independent variables in the model that will positively

affect *GLA*'s overall perceived quality of services as all the values in both tables are the same.

- With X_{SGN} (*Savings generated by GLA*) perceived by management to be at any level above 1, QAL could only be maximised when X_{CWM} (*Cooperating with management*) is maintained at a maximum level (7).
- With X_{SGN} (*Savings generated by GLA*) perceived by management to be excellent (i.e. at the maximum level 7), QAL could only be maximised if the performance in the remaining four quality areas were also rated by management to be near perfect (i.e. 6 or above).

With reference to Bruwer (1981), Krüger (1993:129) suggests that the mean optimum values, at maximum and minimum QAL-values, provide a quick and easy method for observing the influence of the remaining variables in the LP model. Table 5.1 below provides this data for the case in hand.

Table 5.1

Mean Optimum Values for the Remaining Decision Variables when X_{SGN} is Restricted to 1, 2, ..., 7.

INDEPENDENT VARIABLE	DIFFERENCE BETWEEN OPTIMUM VALUES	MEAN OPTIMUM VALUE AT MAXIMUM	MEAN OPTIMUM VALUE AT MINIMUM
X_{FMT}	1,71	4,71	3,00
X_{CST}	0,42	4,28	3,86
X_{DOS}	1,78	5,64	3,86
X_{CWM}	2,43	6,50	4,07

For the data contained in Table 5.1 it can be argued that when X_{SGN} is restricted to 1, 2, ..., 7:

- X_{FMT} (*Feedback from top management*) will have a fair influence on the maximum level as to how management perceive *GIA*'s overall quality of products and services. This criterion should, therefore, not be neglected by the *DIA* when developing the required strategies to maximise his department's perceived quality of services.
- X_{CST} (*Continuous training/development of audit staff*) will not have a material influence on the maximum perceived level of QAL and should, therefore, probably only be concentrated on last. It is only when X_{SON} is perceived to be at a level of 5 and above, that overall quality could be improved by improving X_{CST} .
- X_{DOS} (*Demonstrated objectivity/independence by audit staff*) will have a material influence on the maximum level of QAL. The *DIA* would probably do well to ensure that a high level of performance is maintained in this area at all times.
- X_{CWM} (*Cooperation with management*) will have a major impact on QAL since its differential band is by far the largest. There can be little doubt that the *DIA* should develop strategies and action plans which will ensure that his department is always performing at maximum level in this quality criterion if he wants to maximise the overall quality of *GIA*'s products and services as perceived by management.

In summary, the above brief discussions of the data contained in **Figure 5.1** and **Table 5.1** indicate how the LP model for optimising quality could be used by the *DIA* as a tool to guide him in his decision-making process where the objective is to maximise the *IAD*'s quality of services as perceived by management.

The only issue not comprehensively addressed in the preceding discussions is the actual interdependency among the five independent variables in the optimisation model. It has specifically been left out in the interests of brevity. Although the interdependency among X_{SON} and the other four independent variables was dealt with above, in order to obtain a complete analysis of the various interdependencies, would require that each of the remaining variables be treated as a state variable. Thus each of the remaining variables should be

substituted, in turn, in the constraint equation 1 of the above LP model. This basically means that X_p must sequentially be set to X_{FMT} , X_{CST} , X_{DOS} , X_{CWM} , and X_{SGN} . For each such setting of X_p , QAL must then be maximised and minimised for each possible value of q (where $q = 1, 2, \dots, 7$) — as was done with X_{SGN} above. The final results obtained for each of the five settings of X_p must then be represented in graph and table format as was done in **Figure 5.1** above. By carefully analysing all the data contained in the various graphs and tables the interdependency among the independent variables could then be determined fairly easily.

5.3 THE FINAL QUALITY ASSURANCE PROGRAM

As mentioned in chapter one, the final objective of the study is the development of a *program* (or model) that could be used by the *DIA* as an aid in deciding upon the allocation of scarce resources in order to optimise the potential benefits to be gained from the implementation of a formal quality assurance/management program (e.g. such as a *TQM* program).

With the optimisation of the regression model for quality completed, the envisaged *quality assurance program* — **currently applicable to *GIA*** — can now be formulated as follows:

- **Step 1** — Through the use of a questionnaire or personal interviews, and by making use of a seven-point scale, determine how the *IAD*'s main clients perceive the *quality* of service achieved by *GIA* in each of the following five areas:
 - Feedback from top management (FMT)
 - Continuous training/development of audit staff (CST)
 - Demonstrated objectivity/independence by audit staff (DOS)
 - Cooperation with management (CWM)
 - Savings generated by *GIA* (SGN)

At the same time, also obtain a rating on the seven-point scale as to how management perceive the *overall quality* (QAL) of *GIA*'s products and services in general.

- **Step 2** — Calculate the average (mean) rating obtained for each of the five criteria and for QAL as perceived by management.
- **Step 3** — With reference to the results obtained in step 2, and by using the calculated actual average rating obtained for the criterion *Savings generated by GIA* (SGN — the state variable), refer to the *Maximise Quality* and *Minimise Quality* tables represented in **Figure 5.1** above. Find the calculated average value (or the value closest to it) for SGN at the top of each of the two tables. Read down the specific column in each table and, respectively, find the maximum and minimum values for *quality* (QAL) at that specific value for SGN. These values represent the possible maximum level to which QAL could be increased and the lowest level that it could be when SGN is at that level.
- **Step 4** — Compare the calculated actual average value obtained for QAL (as per step 2) with the maximum and minimum values for QAL as obtained from the tables mentioned in the previous step. Decide whether or not the actual average rating for QAL is at an acceptable level (i.e. as close as possible to the maximum level). If acceptable, report the results of the quality measurement review to management at the various audit committees and to *GIA*'s own staff. If not, proceed to the next step.
- **Step 5** — Again referring to the values contained in the quality optimisation tables, and by using the same procedure as described in step 3, find the respective maximum and minimum values for the remaining four quality criteria and compare them with their calculated actual average ratings achieved. This exercise will provide the *DIA* with the necessary information to decide with a large degree of certainty in which areas his department is either over- or under-performing when SGN is at that level.

- **Step 6** — With the information obtained via the preceding step, determine which activities and performance areas should receive attention first. The contents of **Table 5.1** above (i.e. differential band between the optimum levels) could be used as a rough guide for this activity. Immediate attention should, for obvious reasons, be given to those activities where the actual average ratings achieved are found to be below the optimum values as indicated in the *Maximise Quality* table.
- **Step 7** — Once the areas needing attention have been decided on, the *DIA* should now work out the most appropriate strategies and action plans for either rectifying poor performance in specific areas of his department's activities, or for increasing already satisfactory performance even further, or both.

An advantage of this proposed quality assurance program (model) is that it can, and probably should, be updated on a regular basis (at least every second year) in order to determine, firstly, whether the model is still applicable within *GIA* and/or, secondly, whether optimum quality levels have increased. If *GIA* wishes to update the program, or if other directors of internal auditing departments wish to establish whether the program is also applicable within their own unique auditing environments, the following steps should be followed:

- **Step 8** — Follow the same procedure as described in step 1 above and obtain two sets of data. One for *quality* (QAL) and one for *importance* (IMP) — as was done in this study.
- **Step 9** — Through the use of regression analyses, establish to what extent the overall ratings obtained for *importance* and *quality* of services are explained by the five independent quality criteria used in the questionnaires as per step 8.

If an acceptable answer for *importance* (as close as possible to or better than 75%) and for *quality* (as close as possible to or better than 69%) is obtained, it can be interpreted to indicate that the five criteria are still perceived by management as the most important criteria for measuring the quality of *GIA*'s products and services and that quality is still adequately

explained by those criteria. Such answers would also indicate whether or not the information contained in the two tables above (see **Figure 5.1**) is still applicable. However, if acceptable answers are not produced by the regression analyses, the *DIA* must know that a change has taken place in his department's audit environment which necessitates further investigation. A totally new research project — in line with that carried out in this study — may be warranted.

- **Step 10** — If step 9 has produced acceptable answers, proceed to follow the above program from step 2 through to step 7.

With the above *quality assurance program* available, the only real constraints remaining as to what the *DIA* can do to improve the overall quality of his department's products and services — as perceived by management — are, firstly, his and his staff's ability to design appropriate strategies through which they can achieve their objectives and, secondly, the resources available for turning their plans into reality. By following the steps of the above proposed *quality assurance program*, much of the usual uncertainty as to what to do in order to improve the quality of the *IAD*'s products and services, can be removed as the program is based on sound and scientifically proven research techniques.

It must, however, be pointed out that the above proposed program is not free standing in any way. It should basically only be regarded as an aid or tool that could be used by a *DIA* to determine — with a substantial degree of certainty — where he should focus his department's time, energy and other scarce resources in order to obtain maximum client satisfaction. The proposed program could, therefore, be considered to be an extension of, or addition to, a comprehensive quality assurance/management program — such as the *TQM* program as briefly described in chapter two. If used in conjunction with one another, the probability of actually increasing the overall perceived quality of an *IAD*'s products and services through the investment of only limited resources, could be improved substantially.

In addition, the proposed program is also not intended to be a replacement for a thorough and in-depth understanding of all the concepts and principles (as discussed in chapter two) applicable to providing clients with a high quality of products and services. It merely serves

to assist the *DIA* to provide the products and services his clients expect in a more efficient, effective and economic manner.

5.4 SUMMARY

The first half of this chapter dealt with the technique used to optimise the regression model for quality as developed in the preceding chapter. The model was optimised for each possible level (1, 2, ..., 7) of the independent variable *SGN* (*Savings generated by GIA*) — also the only chosen state variable in this study. The results of the optimisation process were then used to produce a graph and two tables. The influence of each independent variable in the model on the dependent variable (*QAL*) could then be observed.

The second half of the chapter addressed the development of a proposed quality assurance program (model) — applicable to *GIA* — that could be used by the *DIA* as a guide or tool in deciding where he should focus his efforts and scarce resources in order to increase the *IAD*'s overall quality of products and services as perceived by management. It was pointed out that other directors of internal auditing departments could also use the proposed quality assurance program for the same purposes. However, they would first have to ensure that the results of this study are applicable within their own unique auditing environments. They could, however, by following the steps of the proposed program, develop their own tables for use in their departments.

CHAPTER SIX

SUMMARY

6.1 INTRODUCTION

This chapter consists of a short summary of the study as a whole and is concluded with some proposals for possible future research.

6.2 SUMMARY

6.2.1 Background

In today's business environment management is under tremendous pressure to ensure that their organisations survive and stay profitable. The days are probably forever gone where inefficient, ineffective and uneconomical services organisations, whether internal or external, were tolerated. This means that if services organisations wish to survive and prosper, they will have to ensure that they provide their clients with the quality of products and services they need and demand. In other words, total client satisfaction has become the key phrase for long-term survival and success of any services organisation — including internal auditing.

One of the best ways for any organisation to ensure total client satisfaction is to implement a comprehensive and effective quality assurance program, such as TQM. However, a comprehensive quality assurance program, to be truly effective, not only requires in-depth knowledge and understanding of the concepts and principles associated with total client satisfaction, but also requires sufficient resources for implementation and maintenance — resources which are seldom available in abundance in an internal auditing department.

6.2.2 Purpose

With the foregoing in mind, the study was initiated to find or develop some tool which could be used by a *DIA* to help him in two specific areas. Firstly, he needs help in identifying those quality criteria regarded as most important by his clients when assessing the overall quality of the products and services they receive from the *IAD*. Secondly, the *DIA* needs assistance and guidance in the allocation of his department's scarce resources between the identified critically important performance areas with the aim of improving the quality of services to the maximum in those areas. The argument is that if the *DIA* could improve the quality of services in the few specific areas regarded as most important to management, then he would, at the same time, be able to optimise the overall quality of his department's products and services as perceived by management.

6.2.3 Research environment

Due to the fact that the study was intended to find solutions to an existing problem in the author's own work environment, the research field was restricted to AAC's Gold and Uranium Division where the author — at the time of the study — was employed as Divisional Internal Audit Manager. Only directors, senior managers and middle managers within the research field who could make a meaningful contribution to the study were selected for research purposes.

6.2.4 Research data gathered

From the literature study conducted it was established that previous research indicated that there were basically only 15 main criteria most often used by an *IAD*'s clients to assess the quality of services they receive from internal auditing. By using these 15 criteria as a basis, a research questionnaire was designed to gather data on two issues within the research environment. Firstly, how important do managers regard each of the individual 15 criteria

to be as an indication of quality of internal auditing services, and do they regard the existence of an official quality assurance/management program as important in general? Secondly, how do managers perceive the actual quality achieved in each of the 15 individual areas and how they perceive the overall quality of services provided to them by *GIA* in particular?

The draft questionnaire was then discussed with certain senior staff from *GIA* as well as with selected directors and other senior managers within the research environment. From the comments obtained, a final questionnaire — consisting of 17 independent quality criteria (11 of the original 15 and 6 new ones) and making use of a seven-point scale — was prepared and distributed for completion and return. From those questionnaires distributed to managers, a response of 69,5% was recorded.

6.2.5 Validating the research data

In order to determine the validity of the research data, two regression calculations were performed on each of the two data-sets (i.e. one for *importance* and one for *quality*). From the results obtained it was established that 82,4% of the ratings managers gave to the importance of having an official quality assurance program within *GIA*, was explained by the 17 independent criteria (variables). In the case of the quality data-set, it was found that 81,2% of management's perceptions as to the overall quality achieved by *GIA* could be explained by the same 17 independent variables. These results were accepted as sufficient proof that the selected quality criteria were in fact valid within the research environment.

6.2.6 Reducing the number of criteria

As it was the purpose of the study to eventually provide the *DIA* with a practical tool to assist him in increasing the overall quality of his department's services with limited resources available, it was necessary to reduce the number of independent variables to a more manageable number. The argument was that the more the number of variables the *DIA* has to concentrate on, the more complex and expensive the *IAD*'s quality assurance efforts become, which, in turn, could reduce the probability of achieving success.

By making use of the *SAS* program's **RSQUARE** procedure, the R^2 values for the two dependent variables (i.e. *importance* and *quality*) were calculated through regression models with only one independent variable in the model, then two, then three, and so forth until all seventeen were included in the model. From the results of this exercise it was established that the R^2 value — for both of the dependent variables — increased by less than 1% after the 7th independent variable was added to the regression model. This was regarded as being sufficient evidence to conclude that there were, for all practical purposes, only seven critically important quality criteria in *GIA* to be concentrated on by the *DIA* if he wishes to optimise his department's perceived overall quality of services.

Through the use of the **REG** procedure's **FORWARD**, **BACKWARD**, **STEPWISE** and **MAXR** options provided in the *SAS* program, it was established that the two dependent variables were *best* explained by the following seven independent variables:

- In respect of overall *importance* (IMP) the seven independent variables together with their coefficients, which explained 77,7% of IMP's variance, were:

- Feedback from top management (FMT)	0,3299
- Feedback from external auditors (FEA)	0,0885
- Continuous training of audit staff (CST)	0,2421
- Demonstrated objectivity of audit staff (DOS)	0,1796
- Ability to prevent/detect fraud (PFI)	-0,1087
- Cooperation with management (CWM)	0,1492
- Savings generated by <i>GIA</i> (SGN)	0,1895

- In respect of overall *quality* (QAL) the seven independent variables together with their coefficients, which explained 79,1% of QAL's variance, were:

- Feedback from top management (FMT)	-0,1652
- Feedback from auditees (FAT)	0,2082
- Continuous training of audit staff (CST)	-0,1754
- Demonstrated objectivity of audit staff (DOS)	0,3027
- Reasonable audit findings etc. (RAF)	0,2503

- Cooperation with management (CWM)	0,3348
- Savings generated by <i>GIA</i> (SGN)	0,2452

The two sub-sets of independent variables were found to be almost the same — five variables were common to each set. In the IMP-set of variables it was only the two variables FEA and PFI that did not also appear in the QAL-set of variables. On the other hand, it was only the two variables FAT and RAF in the QAL-set of variables that did not also appear in the IMP-set of variables.

6.2.7 Developing the final regression model for quality

The fact that the two sub-sets of independent variables were not totally common, and considering the objective of the study to maximise quality, necessitated a further reduction of the number of independent variables. This was done in order to eventually obtain a set of variables that was common to IMP and QAL — it would be counterproductive to allocate scarce resources to improve the quality of services in an area of the *IAD*'s activities which was not regarded as materially important by management.

The two independent variables with the smallest coefficients (FEA and PFI) were then removed from the IMP-set of variables and the R^2 value for IMP calculated with only the remaining five variables in the regression model. It was found that variation in IMP was still adequately (75,5%) explained by the five remaining independent variables. An additional correlation analysis confirmed that removing FEA and PFI from IMP's *best* sub-set of seven independent variables was justified in order to obtain a common sub-set of variables for the two dependent variables IMP and QAL.

The regression (with only the five common independent variables in the model) and correlation analyses performed on the QAL data-set revealed that — although not the *best* — the common five independent variables still explained variation in QAL (69,3%) quite acceptably.

The final regression model for QAL was then formulated as follows:

$$\text{QAL} = 0,1614 - 0,0725\text{FMT} - 0,1200\text{CST} + 0,3472\text{DOS} + 0,4535\text{CWM} + 0,3346\text{SGN}$$

$$\text{with } R^2 = \underline{0,69,3} \text{ (or } 69,3\%)$$

and the F-test: Probability of $F > 18,97$ as observed is less than 0,0001.

6.2.8 Optimising the final regression model for quality

The next step towards the development of a tool that could be used by the *DIA* was to optimise the final regression model developed for QAL. This was done by way of an optimisation technique developed by Bruwer and Hattingh (1985) which required the construction of a linear program by using the linear regression function for quality as the objective function. The dependent variable QAL was then maximised and minimised at each possible level (1, 2, ..., 7) of the chosen state variable *Savings generated by GIA* (SGN). The results obtained from this exercise were used to produce a graph and two optimisation (maximum and minimum values) tables where the influence of each independent variable on the optimum values of QAL could be observed.

In conclusion of the study a proposed quality assurance program, consisting of ten steps, was then formulated. It is this proposed program that could be used by the *DIA* as a tool to assist him with the allocation of scarce resources in the most efficient, effective and economical manner in order to improve the overall quality of the *IAD*'s products and services as perceived by management.

6.3 CONCLUSION

From the above summary it can be argued that the results of the research work indicate that the two specific objectives set for the study have been achieved. The objectives were to:

- *Determine the criteria most often used by GIA's main clients to evaluate/assess the quality of products and services provided to them by the department.*

This objective was addressed during the first part of the study where it was found that the 17 independent quality criteria selected for inclusion in the research questionnaire explained at least 82% of the variance in the overall rating management gave to the importance of having an official quality assurance program within *GIA*. It was also found that the same 17 quality criteria explained at least 81% of the variance in management's perception as to the overall quality of services they currently receive from *GIA*. In addition, and through the use of further regression and correlation analyses, it was found that the two sub-sets of 7 quality criteria listed above (sub-section 6.2.6) for *importance* (IMP) and *quality* (QAL) respectively, could be regarded as being of critical importance to management as they *best* explain variation in the two objective functions IMP (77,7%) and QAL (79,1%). Furthermore, by optimising the final regression model for QAL, it was shown that the perceived level of performance achieved, in especially the two criteria SGN (*Savings generate by GIA*) and CWM (*Cooperation with management*), would have a major impact on management's perception as to the overall quality of *GIA*'s services.

- *Formulate and propose a program or model that could be used by GIA as an aid in deciding upon the allocation of scarce resources with the objective of optimising the potential benefits to be gained from the implementation of an official quality assurance/management program.*

The proposed 10-step quality assurance program developed in chapter five is based on the five most critically important quality criteria and indicates the level of perceived performance at which each of those criteria should be if *GIA* wishes to maximise its overall quality of services as perceived by management. The proposed program could now make the completion of lengthy data collection questionnaires by management unnecessary — normally one of management's main complaints with such surveys — when *GIA* wishes to assess the level of satisfaction of its clients. By knowing

which quality criteria are important to management, and by knowing the desired level of performance to be achieved in each of them in order to maximise the overall quality of the department's services as perceived by management, the *DIA* could develop pro-active strategies and action plans to focus *GIA*'s quality assurance efforts on those few critically important areas. Measuring the results of *GIA*'s quality assurance activities could then be done through focused informal questions put to management after the completion of each audit project. With reference to the quality optimisation tables developed in chapter five — which form part of the proposed quality assurance program — overall client satisfaction with the services rendered could now easily be determined, even on a project for project basis if desired.

6.4 LIMITATIONS OF STUDY AND SUGGESTED FURTHER RESEARCH

This study, as far as the author could establish, was the first attempt within the internal auditing discipline to develop a tool based on scientifically proven techniques for determining:

- those quality criteria that are most important to clients; and
- what performance level is required in each of those criteria if perceived overall quality is to be maximised.

However, a number of limitations were identified in the models and techniques applied which have not been satisfactorily addressed and which warrant further investigation. These limitations opened various opportunities for further research to be conducted. A brief summary of such limitations and opportunities follows:

- The area of experience needs to be expanded (i.e. bigger sample). Comparable studies of other organisations are necessary to improve and validate the model as generally accepted. Proper stratification within an organisation (different regions, as well as different levels of management)

is also desirable to provide for different perceptions. Expansions both laterally and vertically will address limitations such as:

- Assumption of linear relationships between dependent and independent variables, which is not necessarily always true.
 - Different perceptions from different levels of clients.
 - Exclusion of important factors (based on average responses from respondents) from the final models. An example in this study was the factor '*Ability to prevent/detect fraud*' which, according to the average score, was perceived to be the most important factor. Yet, when reducing the number of factors in the regression analysis from seven to five, this factor was excluded from the model.
- The use of computer power is generally recommended as an enhancement to productivity. Research to establish the proposed models of the study as a generally accepted computerised tool may be worthwhile. Computerisation will ensure that the mathematical nature of the models, which may be difficult to use and understand for inexperienced users, does not become a problem.
 - Assurance that a comprehensive list of factors is used will always be questionable. Expanding the area of experience, mentioned above, will to a great extent alleviate this question. Additional interesting research would include the investigation into the use of artificial intelligence to determine appropriate factors. An application of this (e.g. Expert System) to simulate human reasoning in order to identify the factors could also be carried out.
 - Further research to address the adjusting of factors with the accompanying costs is necessary. Although the model suggests to a certain extent (on a seven-point scale) how other factors may react when adjusting one of them, it is unable to suggest exactly where and to what extent financial resources should be applied. This may pose serious problems as limitations such as the following may then become a reality:

- Determining of unit costs to adjust specific factors.
- Interdependence among different factors when allocating financial resources to them.

6.5 CONTRIBUTION OF THE STUDY

Notwithstanding the foregoing and although the study was restricted to *GLA's* specific environment, heads of internal auditing departments in other companies could also apply the proposed quality assurance program — and perhaps even the results of this study — within their own organisations. The program suggests a quick and easy way to determine whether or not the actual results obtained through this study are also applicable to other companies. However, should it be found that the study's results are not totally applicable, the methodology and techniques used here could, nevertheless, be equally appropriate for the development of similar quality optimisation tables. Such tables could then be used in conjunction with the proposed quality assurance program.

AFRIKAANSE OPSOMMING

'N KWALITEITVERSEKERINGSPROGRAM VIR 'N INTERNE OUDITFUNKSIE

Uit die literatuur blyk dit duidelik dat 'n interne ouditfunksie se langtermynoorlewing en -sukses ten nouste saamhang met sy vermoë om sy belangrikste kliënte — naamlik die direkteure, top- en seniorbestuur — se tevredenheid met die funksie se produkte en dienste te verseker.

Een van die beste maniere om kliëntetevredenheid te verseker is deur die ontwerp, implementering en instandhouding van 'n omvattende kwaliteitsbestuurstelsel. Die probleem is egter dat 'n interne ouditdepartement (IOD) nie altyd oor die nodige fondse, mannekrag of kennis beskik om sodanige stelsels te implementeer en instand te hou nie.

Die doel van hierdie studie is derhalwe om 'n program (of model) te ontwikkel wat deur 'n IOD as hulpmiddel gebruik kan word om sy kwaliteitsversekeringsaktiwiteite so doel-treffend en koste-effektief as doenlik te fokus op slegs daardie aspekte van sy dienste en aktiwiteite, wat daartoe sal bydra dat die kwaliteit van die IOD se dienste gemaksimeer kan word in die oë van sy belangrikste kliënte (bestuur).

Uit beskikbare literatuur oor die onderwerp is daar vasgestel dat daar basies 15 kriteria is waaraan bestuur die kwaliteit van 'n IOD se dienste kan meet. Hierdie 15 kriteria word as vertrekpunt vir die studie geneem. Nadat die geldigheid van die 15 kriteria deur informele gesprekke met sommige bestuurders in die gekose studieobjek (Anglo American Corp. se Goud en Uraan Divisie) getoets is, is 'n navorsingsvraelys opgestel wat uit 17 kriteria bestaan het (11 van die oorspronklike 15 en 6 nuwes soos aanbeveel deur bestuur). Bestuurders is toe versoek om die vraelys te voltooi deur op 'n sewe-puntskaal aan te toon as hoe *belangrik* hulle elk van die 17 kriteria ag, as 'n maatstaf vir die meting van kwaliteit, en ook hoe belangrik hulle, in die algemeen, die bestaan van 'n amptelike kwaliteitsversekeringsprogram in 'n IOD beskou. Hulle is ook versoek om op 'n sewe-puntskaal aan te toon wat hul persepsie is met betrekking tot die werklike *kwaliteit* diens wat

hulle van die IOD ontvang in terme van elk van die 17 aktiwiteite afsonderlik en die IOD as geheel.

Deur die navorsingsdata te ontleed met behulp van 'n rekenaarprogram en deur gebruik van regressietegnieke is daar vasgestel dat die 17 kriteria nie net *belangrik* (IMP) is vir bestuur nie, maar dat dit ook bestuur se persepsie met betrekking tot die *algemene kwaliteitsvlak* (QAL) van die IOD se dienste tot minstens 81% verklaar. Daar is toe voortgegaan met verdere regressie-, korrelasie- en ander statistiese tegnieke om te bepaal watter van die 17 onafhanklike kriteria die variasie in IMP en QAL die **beste** verklaar. Daar is gevind dat 7 kriteria — waarvan 5 gemeenskaplik was — in elke datastel die variasie in IMP en QAL respektiewelik met 77,7% en 79,1% verklaar. Die sewe belangrikste kriteria is toe verder verminder tot vyf ten einde 'n gemeenskaplike deelversameling van onafhanklike kriteria te verkry wat die variasie in IMP en QAL nog steeds bevredigend verklaar (naamlik 75,5% en 69,3% respektiewelik). Die onderstaande is die finale lineêre regressie model wat vir *kwaliteit* verkry is:

$$\text{QAL} = 0,1614 - 0,0725\text{FMT} - 0,1200\text{CST} + 0,3472\text{DOS} + 0,4535\text{CWM} + 0,3346\text{SGN}$$

$$\text{met } R^2 = \underline{0,69,3} \text{ (of } 69,3\%)$$

en die F-toets: Waarskynlikheid van $F > 18,97$ soos waargeneem is minder as 0,0001.

Waar:

QAL = Oorhoofse kwaliteit van die IOD se dienste

FMT = Terugvoer vanaf topbestuur

CST = Voorgesette opleiding van die IOD se personeel

DOS = Gedemonstreerde onafhanklikheid van die IOD se personeel

CWM = Samewerking met lynbestuur

SGN = Besparing gegenereer deur die IOD

Die invloed van 'n spesifieke onafhanklike kriterium op die afhanklike QAL is vervolgens ondersoek deur 'n tegniek ontwikkel deur Bruwer en Hattingh (1985). 'n Lineêre programmerings-probleem is toe geformuleer en opgelos vir elke moontlike waarde (1, 2, ..., 7) van die gekose staatveranderlike (m.a.w. nie onder die navorser se direkte beheer)

SGN. Sodoende is die maksimum- en minimumvlakke van nie net QAL nie, maar ook dié van al die ander onafhanklike kriteria, in die model verkry by hierdie optimale oplossing. 'n Addisionele voordeel van hierdie optimaliseringstegniek is dat die invloed wat 'n verandering in die prestasievlak van een onafhanklike kriterium op die ander kan uitoefen, redelik maklik geïdentifiseer kan word.

Tabelle en 'n grafiek wat die resultate van die optimaliseringsproses aandui word opgestel en 'n kwaliteitsversekeringsprogram, bestaande uit tien stappe, word as die finale produk van die studie geformuleer.

Die voorgestelde kwaliteitsversekeringsprogram kan deur die IOD as riglyn gebruik word om die kwaliteit van sy dienste, soos ervaar deur bestuur, te maksimeer deur sy beperkte beskikbare fondse en mannekrag te fokus op daardie kriteria wat die grootste bydra lewer tot kliëntetevredenheid.

BIBLIOGRAPHY

- ALBRECHT, W.S., HOWE, K.R., SCHUELER, D.R. & STOCKS, K.D. 1988. Evaluating the effectiveness of internal audit departments. Altamonte Springs, Florida: The Institute of Internal Auditors Research Foundation, 161 p.
- ANDERSON, U. 1983. Quality assurance for internal auditing. Altamonte Springs, Florida: The Institute of Internal Auditors, Inc. 148 p.
- ANDERSON, U.L. 1991. Quality assurance, total quality management, and the evaluation of the internal audit function. *Internal Auditing*, 7(2): 66-71, Fall.
- ANON. 1987. IIA issues guidance on quality assurance. *Internal Auditing Alert*, 7(3): 6-7, April.
- †ANON. 1993a. Dissatisfied with the work of auditors? *Podium*, 2(3): 1-2, July.
- †ANON. 1993b. Managing quality. *Podium*, 2(2): 7-9, May.
- ANON. 1993c. TQM in the audit function. *Internal Auditing Alert*, 13(2): 5-6, March.
- BAILEY, J.E. & PEARSON, S.W. 1983. Development of a tool for measuring and analysing user satisfaction. *Management Science*, 29(5): 530-545, May.
- BERENSON, M.L. & LEVINE, D.M. 1986. Basic business statistics: Concepts and applications. 3rd ed. Englewood Cliffs, New Jersey: Prentice-Hall International, Inc. 907 p.
- BRAIOTTA, Jr. L. 1981. The audit director's guide: How to serve effectively on the corporate audit committee. New York: John Wiley & Sons. 303 p.
- BRAIOTTA, Jr. L. 1993. The impact of international standards on auditors. *Internal Auditing*, 8(4): 59-65, Spring.
- BRUWER, P.J.S. 1981. Bydraes tot modelontwikkeling ten einde gerekenariseerde stelsels se werkverrigting te valueer. Potchefstroom : PU vir CHO. (Proefskrif - D.Sc.) 337 p.
- BRUWER, P.J.S. & HATTINGH, J.M. 1985. Constrained regression models for optimisation and forecasting. *ORION*, 1(1): 2-15, May.

- BURNABY, P.A., POWELL, N.C. & STRICKLAND, S. 1994. Internal auditing internationally: Another step toward global harmonization. *Internal Auditing*, 9(3): 38-53, Winter.
- *CAPUDER, Sr. L.F. 1992. Total quality management and internal controls. *Internal Auditing Alert*, 12(11): 5-7, December.
- CASCARINO, R. 1992. Internal audit quality as a defence against outsourcing. *Internal Audit Review*: 4-6, March.
- CHAMBERS, A.D., SELIM, G.M. & VINTEN G. 1990. Internal auditing. 2nd ed. Great Britain: Pitman. 439 p.
- CHATTERJEE, S. & PRICE, B. 1977. Regression analysis by example. New York. 228 p.
- COURTEMANCHE, G. 1992. Outsourcing the internal audit function. *Internal Audit Review*: 4-8, January.
- CROSBY, P.B. 1988. The eternally successful organization. New York: McGraw-Hill Book Company. 255 p.
- CURWIN, J. & SLATER, R. 1991. Quantitative methods for business decisions. 3rd ed. London: Chapman & Hall. 426 p.
- EDOSOMWAN, J.A. 1991. The Baldrige Award: Focus on total customer satisfaction. *Industrial Engineering*: 24-26, July.
- EDOSOMWAN, J.A. & SAVAGE-MOORE, W. 1991. Assess your organisation's TQM posture and readiness to successfully compete for the Malcolm Baldrige Award. *Industrial Engineering*: 22-24, February.
- GIBSON, J.L., IVANCEVICH, J.M. & DONNELLY, J.H. 1988. Organizations: Behaviour; structure; processes. 6th ed. Homewood, Illinois: Irwin. 845 p.
- GREENWALD, R. 1992. An internal auditor's guide to self management. *Internal Audit Review*: 10-11, January.
- HILL, S.D. 1992. Total quality management: A primer for the internal auditor. *Internal Auditing Alert*, 12(10): 5-7, November.

- HILL, P. 1993. How to measure quality. *Accountancy SA*: 26-27, November/December.
- HO, J.K. 1987. Linear and dynamic programming with Lotus 1-2-3. Oregon: Management Information Source, Inc. 330 p.
- HOGAN, W.M. 1994. How to apply TQM to the internal audit function. *Internal Auditing*, 9(3): 3-14, Winter.
- HOLLEY, C., HUDSON, E. & LINVILLE, J. 1989. Bank auditee perceptions of internal auditors. *Internal Auditing*, 5(1): 26-33, Summer.
- HORN, K.N. 1992. An audit committee member looks at internal auditing. *Internal Auditor*: 32-36, December.
- HOUCK, T.P. 1994. Improving efficiency in your audit department. *Internal Auditing*, 9(3): 32-37, Winter.
- HUSTON, J.H. 1989. Quality assurance for dispersed internal auditing units. *Internal Auditing*, 4(4): 40-56, Spring.
- JEFFORDS, R., GRAYBEAL, S. & DAVEY, F. 1994. Applying TQM to the internal audit department. *Internal Auditing*, 9(3): 15-22, Winter.
- JULIEN, F.W. & LAMPE, J.C. 1993a. Performance measures in internal auditing. *Internal Auditing*, 9(2): 66-73, Fall.
- JULIEN, F.W. & LAMPE, J.C. 1993b. Sharing best practices in internal audit. *Internal Auditing*, 8(4): 66-72, Spring.
- KALBERS, L.P. 1992. Audit committees and internal auditors. *Internal Auditor*: 37-44, December.
- KASPAREK, W. 1989. A director's viewpoint on excellence and independence. *Internal Auditing*, 5(1): 96-99, Summer.
- KENNEDY, H. 1994. CSM — The tool for meeting and managing customer expectations. (In *Customer satisfaction measurement*: 2 Papers delivered at a conference presented by AIC Conferences held in the Sandton Holiday Inn on 29 and 30 March 1994. Sandton.)
- KERLINGER, F.N. 1986. Foundations of behavioural research. 3rd ed. New York: CBS Publishing. 667 p.

- KOTLER, P. 1988. Marketing management: Analysis, planning, implementation, and control. 6th ed. Englewood Cliffs, New Jersey: Prentice-Hall International, Inc. 776 p.
- KRÜGER, H.A. 1993. Determination of an effective resource allocation strategy based on factors influencing risk with different computerised systems. Potchefstroom: PU vir CHO. (Thesis - PhD) 195 p.
- LAMPE, J.C. & SUTTON, S.G. 1991. Integrated productivity and quality measures for internal audit departments. *Internal Auditing*, 7(2): 51-65, Fall.
- ✧ LASH, M.L. 1989. The complete guide to customer service. New York: John Wiley & Sons. 216 p.
- LAWRENCE, P. & MANN, R. 1993. Value and financial services. *Insights Quarterly*, 5(2): 56-63, Fall.
- LEMIEUX, R.N. & KOSIEK, T.M. 1989. Understanding the business environment and operations. *Internal Auditing*, 4(4): 89-93, Spring.7
- ✧ LIVNI, L. 1994. Evaluation and improvement a management responsibility. *HRM*: 26-27, March.
- ✧ LLOYD CHESTER, F. 1993. When "good" isn't good enough. *Internal Auditor*: 30-34, August.
- LUDEMAN, K. 1992. Using employee surveys to revitalize TQM. *Training*: 51-57, December.
- MACKLEM, A.W. 1994. Quality: Common denominator for success. *HRM*: 24-26, February.
- McHUGH, Jr. R.D. 1988. The auditor as external consultant. *Audit Update*, 4(8): 22-24, April/May.
- MILLER, J. & DOYLE, B.A. 1987. Measuring the effectiveness of computer-based information systems in the financial services sector. *MIS Quarterly*, 11(1): 107-124, March.
- ✧ MORLEY, B.K. 1988. Audit service quality. *Audit Update*, 4(8): 10-11, April/May.
- OLIVERIO, M.E. & NEWMAN, B.H. 1993. Optimizing the internal audit function: The audit committee's contribution. *Internal Auditing*, 9(1):67-72, Summer.

- PAAPE, L. 1993. Seizing opportunities. *Internal Auditor*: 51-56, December.
- PARASURAMAN, A., ZEITHAML, V.A. & BERRY, L.L. 1985. A conceptual model of service quality and its implications for future research. *Journal of Marketing*: 49-53, Fall.
- PEACOCK, E. & PELFREY, S. 1991. Measuring internal auditor productivity. *Internal Auditing*, 6(4): 32-37, Spring.
- PELFREY, S. & PEACOCK, E. 1993. Updating internal auditor productivity criteria. *Internal Auditing*, 9(1): 25-32, Summer.
- PETERS, B.J. 1992. 40 Years on — it's decision time. *Internal Audit Review*: 10-17, September.
- RAND, Jr. R.S. 1994. Samurai audit manager's readiness for TQM. *Internal Auditing*, 9(3): 23-31, Winter.
- REDELINGHUIS, A., JULYAN, F.W., STEYN, B.L. & BENADE, F.J.C. 1989. Kwantitatiewe metodes vir besluitneming. Durban: Butterworth. 483 p.
- REINSTEIN, A. & FARRAGHER, E.J. 1985. Increasing the profession's recognition and respect. *The Internal Auditor*: 41-42, August.
- RICE, F. 1992. What intelligent consumers want. *Fortune International*, (27): 41-46, December 28.
- ROOT, S.J. 1993. Internal auditing manual. 3rd ed. New York: Warren Gorham Lamont.
- SAS/STAT USER'S GUIDE. 1990. Volume 2 Version 6. 4th ed. North Carolina: SAS Institute Inc. 479 p.
- SAWYER, L.B. 1984. The essence of management-oriented internal auditing. *The Internal Auditor*: 42-46, June.
- SCUDDER, R.A. & KUCIC, A.R. 1991. Productivity measures for information systems. *Information and Management*, 20(5): 343-354, May.
- SOUTH AFRICAN BUREAU OF STANDARDS. 1987. Code of practice for quality systems: Part IV — Quality management and quality system elements — guidelines (SABS 0157-Part IV, equivalent to ISO 9004/1987). 1st Revision. Pretoria: The Council Of The South African Bureau of Standards. 17 p.

STANLEIGH, M. 1993. Accounting for quality. *Accountancy SA*: 10-13, July.

STEEL, J.D. 1993. Matching audit objectives with management goals. *Internal Auditor*: 51-56, June.

STEWART, R.H. 1992. Service quality from disciplined endeavour. *Management Accounting*: 19, November.

STEYN, A.G.W., SMIT, C.F. & DU TOIT, S.H.C. 1984. Moderne statistiek vir die praktyk. Pretoria: J L van Schaik. 615 p.

STOKES, N. 1986. Putting value for money auditing into practice. *Audit Update*: 12-13, April.

STOWELL, D.M. & HUNT, L.C. 1993. Total quality management planning and implementation. (In Umbaugh, R.E., ed. Handbook of IS management: 1993-1994 yearbook. Boston: Auerbach Publications. p.351-364.)

SUMNERS, G.E. & TOERNER, M.C. 1993. External quality assurance reviews can positively affect the application of SAS No. 65. *Internal Auditing*, 8(3): 34-40, Winter.

THE INSTITUTE OF INTERNAL AUDITORS, Inc. 1978. Standards for the professional practice of internal auditing. Altamonte Springs, Florida: The Institute of Internal Auditors, Inc. 26 p.

THE PROFESSIONAL STANDARDS AND RESPONSIBILITIES COMMITTEE. 1986. Statement on internal auditing standards number 4 — November: Quality assurance. Altamonte Springs, Florida: The Institute of Internal Auditors, Inc. 10 p.

TIESSEN, P. & BARRETT, M.J. 1989. Organizational support for internal audit. *Internal Auditing*: 39-53, Fall.

TREACY, M. & WIERSEMA, F. 1993. Customer intimacy and other value disciplines. *Insights Quarterly*, 5(2): 40-55, Fall.

UYS, J. 1992. Quattro Pro: A user's guide. Versions 3 & 4. Stellenbosch: Helderberg Publishers. 205 p.

VAN DER MERWE, L. 1991. Total quality management. A six part delivery — sequentially numbered from 1 to 6 — as contained in the internal *Kynoch Bulletin* over the period January to December.

WARNER, H.C. 1984. Peer review: Friend or foe? *The Internal Auditor*: 20-24, August.

WHITEHEAD, P. & WHITEHEAD, G. 1992. Statistics for business. 2nd ed. London: Pitman. 308 p.

QUESTIONNAIRE

Please indicate on the two separate seven-point scales below how you would rate, firstly, the *importance* of each of the undermentioned as a quality criterion/measure for inclusion in a quality assurance program and, secondly, the *quality* achieved/provided by GIA in each of the areas listed.

Please note that the two columns must be treated totally *independently* from one another, in other words the *Importance* column must not be regarded as a benchmark or ideal situation for the *Quality* column. For example, you may believe that criterion 3 — feedback from external auditors — not to be an important general measure of quality and you would, therefore, rate it as low, but regardless of how you feel about the measure in general, you nevertheless believe that GIA is doing well in that area and would, therefore, rate the Quality achieved column as high.

QUALITY CRITERION/MEASURE/AREA	IMPORTANCE							QUALITY						
	Low		Average			High		Low		Average			High	
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1. Feedback from top management														
2. Feedback from auditees														
3. Feedback from external auditors														
4. Reasonable and meaningful audit findings, comments and recommendations														
5. Professionalism of the GIA's employees														
6. Absence of surprises contained in audit reports														
7. Continuous training/development of auditing staff														
8. Evidence that GIA has the interests of the company/management at heart														
9. Demonstrated objectivity/independence by audit staff														
10. Ability to prevent/detect/report fraud, theft and other irregularities														
11. Cooperation with management														
12. Demonstrated competence of GIA's staff														
13. Adherence to audit plans														
14. Cost-effectiveness of GIA														
15. Responsiveness to ad hoc audit requests from management														
16. Savings generated by GIA														
17. Overall quality of audit reports and presentations														

Considering all of the above, how would you rate:														
18. The necessity, in general terms, of having a quality assurance programme								*	*	*	*	*	*	*
19. The overall quality of GIA's services to your company in particular	*	*	*	*	*	*	*							

RESEARCH DATA

A. IMPORTANCE RATINGS - SUPPLIED BY GIA's OWN STAFF

No.	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
	FMT	FAT	FEA	RAF	PFE	AOS	CST	IAH	DOS	PFI	CWM	DCS	ATP	CEF	RFM	SGN	OVQ	IMP
1	7	6	5	7	7	6	6	6	7	5	7	7	6	6	6	4	7	6
2	6	7	4	7	7	6	6	7	7	6	7	6	7	6	5	5	7	6
3	4	6	3	6	6	5	5	6	7	4	5	6	4	5	5	4	7	5
4	6	6	4	7	7	6	6	6	6	7	7	7	6	6	6	6	7	6
5	5	6	3	7	5	6	6	6	6	6	7	6	4	2	5	1	5	5
6	7	6	7	7	7	7	7	7	7	6	7	7	7	7	7	7	7	7
7	7	7	5	7	6	6	5	6	5	6	6	5	5	5	4	3	6	5
8	7	7	5	6	6	6	6	6	6	6	7	6	5	5	6	5	6	6
9	7	6	4	7	7	1	6	7	7	5	7	7	5	7	7	7	7	7
10	6	7	4	6	5	4	6	6	5	5	6	5	4	4	3	2	5	5
11	5	6	5	7	5	4	6	7	6	7	6	7	4	3	6	5	7	6
12	3	6	2	6	6	5	6	5	6	4	5	6	5	5	6	4	6	6
13	7	7	2	7	5	5	3	6	5	3	6	6	5	5	5	4	7	5
14	7	7	6	7	7	6	7	7	6	7	7	6	6	7	6	7	7	7
15	6	6	6	7	6	6	6	6	6	6	6	6	5	6	6	6	7	6
16	6	6	7	7	7	7	7	7	6	7	7	7	7	6	7	5	7	7
17	6	6	7	6	7	6	6	7	7	7	6	7	6	6	6	6	6	6
18	6	6	6	7	7	5	7	6	6	6	7	6	5	6	6	4	6	6
19	6	6	6	7	5	4	7	6	6	6	6	6	5	7	6	6	6	6
20	6	5	5	6	7	5	6	6	7	5	7	7	4	6	6	4	7	6
21	7	7	5	7	7	7	6	7	7	7	7	7	6	7	6	5	7	7
22	6	7	4	7	6	6	6	7	6	6	6	6	5	7	5	6	7	6
23	7	7	4	7	6	7	7	7	7	3	5	7	5	6	6	5	7	7
24	7	7	7	6	7	6	7	6	7	7	7	7	6	7	6	7	7	7
25	6	5	4	6	6	6	6	6	6	6	6	6	5	5	6	5	6	6
26	6	6	5	6	7	6	6	6	7	6	6	7	5	5	6	5	6	6
27	6	6	2	6	4	6	6	6	3	4	7	4	4	3	4	2	3	4
28	6	5	4	6	6	6	6	6	5	6	6	6	5	5	5	5	6	5
29	7	5	5	6	7	5	6	6	5	4	6	7	4	5	5	3	5	6
30	7	4	6	7	6	2	6	6	5	6	5	6	5	6	4	5	6	6

Q = Questionnaire reference number

B. QUALITY RATINGS - SUPPLIED BY GIA's OWN STAFF

No.	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q19
	FMT	FAT	FEA	RAF	PFE	AOS	CST	IAH	DOS	PFI	CWM	DCS	ATP	CEF	RFM	SGN	OVQ	QAL
1	6	5	2	6	5	7	3	4	7	4	6	6	5	5	6	5	6	6
2	4	5	3	6	5	6	4	5	6	4	6	4	5	4	6	7	6	5
3	4	6	2	6	6	6	5	6	7	4	6	6	5	5	5	3	7	6
4	4	6	2	6	5	4	3	4	6	6	6	5	5	5	4	3	6	4
5	3	2	1	5	5	6	5	6	3	5	5	4	4	5	6	6	6	6
6	6	5	4	6	5	5	2	6	5	5	6	5	5	5	6	5	5	5
7	3	4	4	5	3	5	4	4	5	4	4	4	4	4	5	5	5	5
8	4	6	4	6	6	6	5	5	5	5	6	5	5	5	6	6	6	5
9	7	5	1	6	6	2	5	7	6	5	7	7	5	7	6	7	6	6
10	4	5	1	4	3	6	4	4	5	4	5	4	5	4	5	3	3	4
11	2	3	1	4	3	4	1	3	6	4	2	2	2	6	7	5	6	6
12	3	5	1	6	4	4	2	4	5	4	4	4	3	4	4	3	5	5
13	4	5	1	5	4	6	3	5	5	3	6	5	5	4	6	4	6	4
14	4	4	4	6	5	5	5	5	5	6	6	5	5	6	6	4	5	6
15	4	4	3	5	6	5	6	5	6	6	6	6	6	5	6	5	6	6
16	4	5	5	6	5	7	5	6	6	6	6	5	6	6	6	5	6	6
17	4	6	5	6	6	7	6	7	6	6	6	6	5	5	5	6	5	6
18	2	4	4	5	4	5	5	4	6	4	5	3	5	5	6	4	5	5
19	6	6	6	7	4	6	7	6	6	6	6	6	6	7	6	6	5	6
20	5	4	6	4	5	5	4	5	5	6	6	5	5	5	6	5	4	6
21	6	5	1	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6
22	3	6	4	8	5	6	6	7	6	4	6	5	5	5	5	4	6	5
23	4	5	1	6	6	7	7	6	6	3	6	5	4	3	4	3	6	6
24	5	5	4	4	5	5	6	5	5	4	5	5	5	4	5	4	5	5
25	4	5	4	6	6	6	6	6	6	6	6	6	5	5	6	5	6	6
26	4	6	5	6	6	6	6	6	6	5	6	6	5	5	6	6	7	6
27	4	6	2	4	5	3	4	6	4	3	6	3	2	2	5	4	5	6
28	5	3	3	5	5	5	5	6	4	5	5	5	4	5	4	4	5	6
29	4	4	3	5	5	6	5	6	4	5	7	5	2	5	7	4	5	5
30	5	4	5	5	5	3	5	6	6	4	4	5	4	5	6	5	4	5

Q = Questionnaire reference number

C. IMPORTANCE RATINGS - SUPPLIED BY ALL OUTSIDE RESPONDENTS (EXECUTIVE/TOP/SENIOR MANAGERS)

No.	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18
	FMT	FAT	FEA	RAF	PFE	AOS	CST	IAH	DOS	PFI	CWM	DCS	ATP	CEF	RFM	SGN	OVQ	IMP
1	6	7	7	7	6	6	5	6	7	7	7	7	5	7	5	5	5	6
2	6	6	4	5	6	2	5	5	7	7	3	6	5	7	6	7	5	6
3	7	6	6	6	7	4	5	6	6	7	6	5	5	5	6	5	6	6
4	6	4	5	6	4	5	3	4	5	6	5	5	4	6	6	6	6	5
5	7	7	5	6	7	3	6	7	6	6	6	7	5	7	7	6	6	6
6	6	6	5	6	7	5	5	6	7	5	6	6	6	5	5	5	6	6
7	5	6	7	6	6	4	6	6	7	6	4	6	4	5	4	6	5	6
8	7	6	5	6	7	1	5	6	6	6	5	6	6	2	4	2	5	5
9	5	6	5	6	6	4	6	5	5	6	3	6	5	6	5	5	6	5
10	6	5	5	7	7	6	5	7	7	6	6	7	3	5	5	6	6	6
11	7	7	5	6	7	4	5	3	7	7	5	7	2	2	6	6	7	6
12	4	6	6	7	7	2	7	7	6	7	4	7	2	6	6	6	7	6
13	7	5	4	7	6	6	6	6	5	7	4	7	3	4	5	6	6	6
14	5	5	6	7	4	5	6	7	6	7	7	5	3	6	7	7	5	6
15	4	2	5	6	6	1	5	6	7	7	4	6	3	4	6	4	5	4
16	5	6	2	6	6	5	5	5	5	6	6	6	6	6	6	4	5	5
17	5	6	5	6	6	2	5	5	5	5	6	5	4	6	5	5	6	5
18	5	4	5	7	6	4	5	4	7	6	4	6	4	3	4	3	4	5
19	7	7	5	6	7	5	6	7	7	7	6	6	6	6	7	2	5	6
20	5	4	4	6	6	6	6	6	6	6	6	5	6	6	7	4	5	6
21	3	4	1	6	6	4	6	7	6	5	6	6	5	6	7	5	5	4
22	6	5	4	7	5	5	6	5	6	7	6	6	3	5	7	4	6	5
23	6	4	6	7	7	2	7	7	7	6	7	7	6	4	6	7	7	7
24	6	6	6	7	6	5	5	6	6	7	7	6	7	6	6	7	5	6
25	5	6	6	6	4	5	6	6	7	7	6	6	4	4	6	4	6	5
26	6	6	6	7	5	2	5	6	6	7	4	6	4	7	5	6	6	5
27	7	7	7	7	7	1	7	7	7	7	7	7	6	7	6	7	7	7
28	4	6	4	7	5	5	4	4	6	7	5	6	4	6	4	7	5	5
29	5	5	3	6	6	5	4	6	5	7	5	4	3	6	5	7	5	4
30	7	4	3	7	6	1	4	6	6	7	5	7	6	7	5	5	6	5
31	6	6	6	7	7	3	5	7	7	7	6	7	5	7	6	7	7	6
32	6	3	5	6	7	6	6	6	5	7	7	5	5	5	6	7	6	6
33	6	4	4	5	5	2	4	4	7	7	3	6	4	6	5	6	4	5
34	6	5	6	6	6	2	6	6	6	6	6	6	3	5	5	6	6	6
35	6	7	7	7	6	6	7	6	6	7	7	6	5	5	6	5	6	6
36	6	6	6	7	7	6	6	7	7	7	7	7	6	6	6	7	7	7
37	6	7	5	7	6	3	7	6	6	5	7	6	6	5	6	4	5	6
38	7	6	3	7	6	4	7	7	6	5	6	7	5	4	7	7	6	7
39	6	6	6	6	5	5	4	6	5	7	6	6	5	3	6	7	6	6
40	7	7	5	6	5	2	5	4	7	7	5	7	5	5	5	6	6	6
41	6	6	5	6	6	6	5	5	7	7	6	7	6	5	4	4	6	6
42	6	5	6	5	6	3	6	5	7	6	4	6	5	5	5	5	6	5
43	6	6	5	7	6	7	7	6	7	7	6	6	4	6	5	4	5	6
44	5	4	2	2	4	4	3	4	4	2	4	4	4	2	4	2	4	4
45	6	6	6	6	7	4	6	7	7	7	7	7	5	6	5	6	6	7
46	5	6	4	6	6	2	4	4	6	7	5	5	4	6	6	4	6	5
47	6	6	6	6	6	4	6	7	6	7	6	7	5	6	6	6	6	6
48	6	6	6	6	6	5	4	5	6	6	5	4	4	4	5	4	5	5

Q = Questionnaire reference number

D. QUALITY RATINGS - SUPPLIED BY ALL OUTSIDE RESPONDENTS (EXECUTIVE/TOP/SENIOR MANAGERS)

No.	Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q19
	FMT	FAT	FEA	RAF	PFE	AOS	CST	IAH	DOS	PFI	CWM	DCS	ATP	CEF	RFM	SGN	OVQ	QAL
1	6	6	5	5	5	5	5	6	5	5	5	5	5	5	5	4	4	4
2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
3	7	6	6	6	6	6	5	5	6	7	6	5	5	5	6	5	6	6
4	5	4	4	4	5	3	4	3	6	5	6	5	5	3	6	3	5	5
5	4	6	4	6	6	3	5	6	6	6	6	6	4	7	7	7	7	6
6	6	6	6	6	6	5	5	6	7	5	6	6	5	5	5	4	6	6
7	3	4	4	6	6	5	5	6	5	3	4	7	5	5	5	6	5	5
8	4	4	5	6	7	4	5	6	6	5	6	6	5	6	6	6	6	6
9	2	4	2	4	5	5	5	6	6	5	4	5	3	4	4	4	4	5
10	4	5	5	6	7	4	5	7	7	6	6	7	5	5	6	6	6	7
11	4	4	6	6	6	3	4	6	7	6	6	6	4	5	5	5	7	6
12	3	6	6	6	6	4	7	7	7	7	6	6	6	6	7	6	6	6
13	4	4	4	6	6	6	4	4	6	6	5	6	5	5	5	7	7	6
14	6	5	6	3	4	7	4	2	5	4	6	5	7	1	4	3	4	4
15	4	1	2	6	5	1	4	6	6	5	5	4	5	6	4	6	5	5
16	4	5	6	5	5	4	5	5	5	6	6	6	6	6	6	3	4	5
17	4	5	5	4	4	4	5	5	5	4	4	4	4	4	4	5	4	4
18	4	4	4	6	5	5	4	6	6	6	6	6	4	4	4	4	5	5
19	5	4	2	5	6	6	5	5	6	5	6	6	6	5	7	4	6	5
20	3	4	5	6	4	5	5	6	4	4	6	5	4	6	7	5	6	5
21	2	4	6	6	6	6	6	7	6	6	6	5	5	6	5	4	5	6
22	2	2	1	5	6	3	5	6	6	5	7	6	4	5	6	4	6	5
23	2	5	6	6	6	4	7	6	6	4	6	6	6	5	6	7	6	7
24	5	5	5	5	4	4	4	4	5	5	5	5	5	5	5	5	4	5
25	3	5	6	6	5	5	5	5	6	6	6	6	5	6	6	5	6	6
26	5	4	4	5	4	4	5	4	4	4	6	5	5	5	5	5	5	5
27	5	4	6	5	6	4	5	7	7	5	6	7	6	5	7	5	6	6
28	2	4	4	3	4	4	4	5	4	4	5	4	4	2	3	2	4	4
29	5	4	5	4	5	5	4	6	3	3	4	3	4	5	5	5	4	4
30	4	5	5	6	6	5	3	7	6	5	6	6	6	6	5	3	6	6
31	4	5	6	6	6	5	4	6	6	6	6	5	6	6	5	7	7	7
32	6	6	6	6	6	5	4	6	7	6	7	5	4	5	6	4	4	6
33	4	4	4	5	5	4	4	5	6	5	5	5	6	5	6	5	5	5
34	6	6	5	6	6	4	4	6	6	6	6	6	5	6	6	5	6	6
35	3	4	2	4	3	3	3	5	4	3	6	4	5	3	5	3	4	6
36	6	6	6	6	7	5	6	6	6	6	7	6	6	6	6	7	7	6
37	3	6	5	5	6	4	4	3	5	5	7	4	4	5	6	2	5	5
38	6	6	3	5	5	3	4	6	6	4	7	5	5	6	7	4	7	6
39	4	6	2	6	4	4	6	3	4	5	5	5	4	3	3	4	5	5
40	5	5	5	5	5	4	4	6	4	4	7	6	5	4	4	4	6	5
41	5	6	5	6	6	5	4	4	6	7	6	7	6	4	4	4	6	6
42	6	5	6	5	5	6	4	5	6	6	5	5	5	5	6	5	5	6
43	5	5	3	4	3	4	4	5	5	5	6	5	5	4	6	6	4	5
44	2	2	2	2	4	4	4	4	4	2	4	4	4	2	4	2	5	2
45	5	5	5	5	6	5	7	7	6	5	7	6	5	6	6	5	5	6
46	6	5	4	6	6	3	2	5	5	6	6	5	4	5	6	6	6	6
47	6	6	6	6	6	4	5	6	5	5	6	5	5	5	5	5	5	5
48	3	4	3	5	4	4	4	4	3	4	4	3	4	4	3	4	4	4

Q = Questionnaire reference number

AVERAGE RATINGS

A. GOLD INTERNAL AUDIT'S OWN EMPLOYEES (GIA)			Importance Ratings							Quality Ratings																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Q										No. of Responses	Accum. Rating	Average Rating								No. of Responses	Accum. Rating	Average Rating																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Code	Ref	Quality criterion/factor/measure	1	2	3	4	5	6	7				1	2	3	4	5	6	7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

B.		ALL OUTSIDE RESPONDENTS (MNG)											Importance Ratings							Quality Ratings									
Q																													
Code	Ref	Quality criterion/factor/measure	1	2	3	4	5	6	7	No. of Responses	Accum. Rating	Average Rating	1	2	3	4	5	6	7	No. of Responses	Accum. Rating	Average Rating							
FMT	Q01	Feedback from management	0	0	1	3	11	23	10	48	278	5.79	0	6	7	13	10	11	1	48	208	4.33							
FAT	Q02	Feedback from auditees	0	1	1	8	7	23	8	48	266	5.54	1	2	0	17	14	14	0	48	227	4.73							
FEA	Q03	Feedback from external auditors	1	2	3	7	16	15	4	48	240	5.00	1	6	3	9	13	16	0	48	219	4.56							
RAF	Q04	Reasonable and meaningful findings, etc.	0	1	0	0	3	25	19	48	300	6.25	0	1	2	6	14	25	0	48	252	5.25							
PFE	Q05	Professionalism of internal auditors	0	0	0	4	8	24	14	48	288	6.00	0	0	2	9	12	22	3	48	255	5.31							
AOS	Q06	Absence of surprises	4	9	4	10	12	8	1	48	189	3.94	1	0	7	19	14	6	1	48	211	4.40							
CST	Q07	Continuous training	0	0	2	7	16	16	7	48	259	5.40	0	1	2	21	17	4	3	48	222	4.63							
IAH	Q08	Interests of company at heart	0	0	1	7	8	19	13	48	278	5.75	0	1	3	6	11	21	6	48	258	5.38							
DOS	Q09	Demonstrated objectivity/independence	0	0	0	2	7	19	20	48	297	6.19	0	0	2	7	10	23	6	48	264	5.50							
PFI	Q10	Ability to prevent/detect fraud	0	1	0	0	5	13	29	48	308	6.42	0	1	3	9	17	15	3	48	243	5.06							
CWM	Q11	Cooperation with management	0	0	3	8	9	18	10	48	264	5.50	0	0	0	6	8	27	7	48	275	5.73							
DCS	Q12	Demonstrated competence of staff	0	0	0	3	7	22	16	48	291	6.06	0	0	2	6	18	18	4	48	256	5.33							
ATP	Q13	Adherence to audit plans	0	2	7	12	15	11	1	48	221	4.60	0	0	1	14	21	11	1	48	237	4.94							
CEF	Q14	Cost-effectiveness of department	0	3	2	6	12	18	7	48	253	5.27	1	2	3	7	20	14	1	48	233	4.85							
RFM	Q15	Responsiveness to ad hoc requests	0	0	0	6	18	19	7	48	267	5.56	0	0	3	8	13	18	6	48	256	5.33							
SGN	Q16	Savings generated	0	3	1	10	9	13	12	48	256	5.33	0	3	5	13	14	8	5	48	226	4.71							
OVQ	Q17	Quality of reports/presentations	0	0	0	3	16	23	6	48	272	5.67	0	0	0	12	13	17	6	48	257	5.35							
IMP	Q18	Overall rating for importance	0	0	0	4	15	24	5	48	270	5.63	-	-	-	-	-	-	-	-	-	-	-						
QAL	Q19	Overall rating for quality	-	-	-	-	-	-	-	-	-	-	0	1	0	6	17	21	3	48	258	5.38							

RANKED RATINGS

TABLE A. RANKED IMPORTANCE RATINGS - MANAGEMENT vs GIA'S OWN STAFF

Code	Q Ref	Quality criterion/factor/measure	Mngmnt's Ratings		GIA's Ratings	
			Rank	Averages	Rank	Averages
PFI	Q10	Ability to prevent/detect fraud	1	6.42	11	5.63
RAF	Q04	Reasonable and meaningful findings, etc.	2	6.25	1	6.60
DOS	Q09	Demonstrated objectivity/independence	3	6.19	10	6.07
DCS	Q12	Demonstrated competence of staff	4	6.06	5	6.30
PFE	Q05	Professionalism of internal auditors	5	6.00	6	6.23
FMT	Q01	Feedback from management	6	5.79	7	6.17
IAH	Q08	Interests of company at heart	7	5.75	4	6.30
OVQ	Q17	Quality of reports/presentations	8	5.67	2	6.33
RFM	Q15	Responsiveness to ad hoc requests	9	5.56	12	5.57
FAT	Q02	Feedback from auditees	10	5.54	8	6.13
CWM	Q11	Cooperation with management	11	5.50	3	6.33
CST	Q07	Continuous training	12	5.40	9	6.07
SGN	Q16	Savings generated	13	5.33	16	4.77
CEF	Q14	Cost-effectiveness of department	14	5.27	13	5.53
FEA	Q03	Feedback from external auditors	15	5.00	17	4.73
ATP	Q13	Adherence to audit plans	16	4.60	15	5.17
AOS	Q06	Absence of surprises	17	3.94	14	5.43
IMP	Q18	Overall rating for importance		5.63		5.97

Q = Questionnaire reference number

TABLE B. RANKED QUALITY RATINGS - MANAGEMENT vs GIA'S OWN STAFF

Code	Q Ref	Quality criterion/factor/measure	Mngmnt's Ratings		GIA's Ratings	
			Rank	Averages	Rank	Averages
CWM	Q11	Cooperation with management	1	5.73	2	5.57
DOS	Q09	Demonstrated objectivity/independence	2	5.50	4	5.47
IAH	Q08	Interests of company at heart	3	5.38	6	5.37
OVQ	Q17	Quality of reports/presentations	4	5.35	3	5.47
RFM	Q15	Responsiveness to ad-hoc requests	5	5.33	1	5.57
DCS	Q12	Demonstrated competence of staff	6	5.33	9	4.93
PFE	Q05	Professionalism of internal auditors	7	5.31	8	4.97
RAF	Q04	Reasonable and meaningful findings, etc.	8	5.25	5	5.43
PFI	Q10	Ability to prevent/detect fraud	9	5.06	12	4.73
ATP	Q13	Adherence to audit plans	10	4.94	15	4.60
CEF	Q14	Cost effectiveness of department	11	4.65	10	4.90
FAT	Q02	Feedback from auditees	12	4.73	11	4.80
SGN	Q16	Savings generated	13	4.71	13	4.70
CST	Q07	Continuous training	14	4.63	14	4.67
FEA	Q03	Feedback from external auditors	15	4.56	17	3.07
AOS	Q06	Absence of surprises	16	4.40	7	5.33
FMT	Q01	Feedback from management	17	4.33	16	4.23
QAL	Q19	Overall rating for quality		5.38		5.47

SATISFACTION RATINGS

TABLE A CALCULATED AND RANKED CLIENT SATISFACTION RATINGS

Code	Q Ref	Quality criterion/factor/measure	Importance Ratings		Quality Ratings		Client satisfaction ratings	
			Original		Original			
			Rank	Avg %	Rank	Avg %	Rank	Avg %
PFI	Q10	Ability to prevent/detect fraud	1	91.71%	9	72.29%	3	66.30%
RAF	Q04	Reasonable and meaningful findings, etc.	2	89.29%	8	75.00%	2	66.96%
DOS	Q09	Demonstrated objectivity/independence	3	88.43%	2	78.57%	1	69.48%
DCS	Q12	Demonstrated competence of staff	4	86.57%	6	76.14%	4	65.92%
PFE	Q05	Professionalism of internal auditors	5	85.71%	7	75.86%	5	65.02%
FMT	Q01	Feedback from management	6	82.71%	17	61.86%	13	51.16%
IAH	Q08	Interests of company at heart	7	82.14%	3	76.86%	7	63.13%
OVQ	Q17	Quality of reports/presentations	8	81.00%	4	76.43%	8	61.91%
RFM	Q15	Responsiveness to ad hoc requests	9	79.43%	5	76.14%	9	60.48%
FAT	Q02	Feedback from auditees	10	79.14%	12	67.57%	10	53.48%
CWM	Q11	Cooperation with management	11	78.57%	1	81.86%	6	64.32%
CST	Q07	Continuous training	12	77.14%	14	66.14%	14	51.02%
SGN	Q16	Savings generated	13	76.14%	13	67.29%	12	51.23%
CEF	Q14	Cost-effectiveness of department	14	75.29%	11	69.29%	11	52.16%
FEA	Q03	Feedback from external auditors	15	71.43%	15	65.14%	15	46.53%
ATP	Q13	Adherence to audit plans	16	65.71%	10	70.57%	16	46.38%
AOS	Q06	Absence of surprises	17	56.29%	16	62.86%	17	35.38%
IMP	QAL	Overall rating for importance and quality		80.43%		76.86%		61.82%

Q = Questionnaire reference number

TABLE B CALCULATED AND RANKED SATISFACTION OF GIA'S OWN STAFF

Code	Q Ref	Quality criterion/factor/measure	Importance Ratings		Quality Ratings		GIA's satisfaction ratings	
			Original		Original		Rank	Avg %
			Rank	Avg %	Rank	Avg %		
RAF	Q04	Reasonable and meaningful findings, etc.	1	94.29%	5	77.57%	1	73.14%
OVQ	Q17	Quality of reports/presentations	2	90.43%	3	78.14%	3	70.66%
CWM	Q11	Cooperation with management	3	90.43%	2	79.57%	2	71.96%
DCS	Q12	Demonstrated competence of staff	5	90.00%	9	70.43%	6	63.39%
IAH	Q08	Interests of company at heart	4	90.00%	6	76.71%	4	69.04%
PFE	Q05	Professionalism of internal auditors	6	89.00%	8	71.00%	8	63.19%
FMT	Q01	Feedback from management	7	88.14%	16	60.43%	14	53.26%
FAT	Q02	Feedback from auditees	8	87.57%	11	68.57%	9	60.05%
CST	Q07	Continuous training	9	86.71%	14	66.71%	11	57.85%
DOS	Q09	Demonstrated objectivity/independence	10	86.71%	4	78.14%	5	67.76%
PFI	Q10	Ability to prevent/detect fraud	11	80.43%	12	67.57%	13	54.35%
RFM	Q15	Responsiveness to ad hoc requests	12	79.57%	1	79.57%	7	63.32%
CEF	Q14	Cost-effectiveness of department	13	79.00%	10	70.00%	12	55.30%
AOS	Q06	Absence of surprises	14	77.57%	7	76.14%	10	59.07%
ATP	Q13	Adherence to audit plans	15	73.86%	15	65.71%	15	48.53%
SGN	Q16	Savings generated	16	68.14%	13	67.14%	16	45.75%
FEA	Q03	Feedback from external auditors	17	67.57%	17	43.86%	17	29.63%
IMP	Q18	Overall rating for importance		85.29%		78.14%		66.64%

Q = Questionnaire reference number