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QUESTIONS ON USING CONTROL SELF ASSESSMENT TECHNIQUES ON INFORMATION SYSTEMS DEVELOPMENT PROJECTS

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95-12796/J

A research report submitted to
the Faculty of Commerce,
University of the Witwatersrand,
Johannesburg, in partial fulfilment
of the requirements for the degree
of Master of Commerce

ABSTRACT

Corporate Governance requires management to report to its stakeholders on Internal Control Systems. Corporate Governance is the system through which organisations are directed and controlled. To meet these requirements management needs a mechanism through which they can stay abreast of such control systems. The aim of this research is to evaluate whether such a mechanism can be provided for Information System Development (ISD) projects, through Control Self-Assessment questionnaire and / or workshop techniques.

The aim of this research is to test existing CSA questionnaire and workshop techniques on information system development projects at Retailer in South Africa, as a part of the overall project management system, in order to identify a practical mechanism that will enable project teams to measure risks and controls and issue control statements to support top management with their corporate governance duties. The research reviews the results of applying CSA questionnaire and workshop techniques to ISD projects at Retailer in South Africa. The objectives are to determine whether CSA questionaire and workshop techinques can provide top management with a process for remaining up to date with control issues in information system development projects in their organisations and whether these techniques can enhance the potential for systems development projects to meet or exceed their objectives.

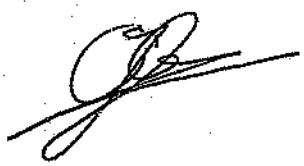
Analysis and interpretation of the data found that CSA workshops can be applied to reports for management on the internal control systems and that workshops will enhance the potential for the successful implementation of IS development projects. The findings of this report should benefit general management in that it describes a technique that can be utilised to obtain the assurance and information stipulated by corporate governance requirements. The report should also assist IS management quantify the achievement of project objectives and non-tangible control factors.

KEY CONCEPTS

information system development (ISD), control self-assessment (CSA), risk, control, corporate governance, workshop, questionnaire

DECLARATION

I declare that this research report is my own, unaided work. It is submitted for the Master of Commerce degree at the University of the Witwatersrand, Johannesburg. It has not been submitted for any degree or examination at any other University.



Andreas Jacobus Erasmus
2 November 1998

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Ms Vivienne Velthuis was the driving force behind a number of successful implementations over a wide spectrum of business functions and processes and provided the opportunity to execute CSA in Information System development proje ts. Ms Velthuis facilitated the workshops and designed the sign-off schedule adopted for the IS development workshops based on workshops conducted in other business areas.

Ms G Jordan, author of 'CSA: Making the Choice' who, in addition to publishing the valuable information in her book, shared her implementation experiences, techniques and pitfalls at Bell South Inc., at an interview in Atlanta in April 1995.

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Chapter 1: INTRODUCTION

1.0 Introduction

The recent worldwide failures of companies, such as Barings Bank and Masterbond, caused concern among stakeholders about how well companies were controlled. Commissions of Enquiry were appointed to research corporate governance issues with the aim of ensuring that adequate systems of internal financial and management controls were maintained in public companies and corporations. The Committee of Sponsoring Organisations of the Treadway Commission (COSO) in the United States, COCO in Canada, the Cadbury Commission in the United Kingdom and the King Commission in South Africa, re-affirmed management's responsibility for ensuring the maintenance of adequate systems of internal control. Their corporate governance recommendations required that management include a statement in the annual financial statements on whether adequate systems of internal control had been maintained. To meet this requirement, management had to institute a mechanism which would keep them informed about the state of internal controls in their organisations.

> *"Boards of Directors, officers, managers and auditors that use the 'historical/traditional approach' to control and risk management should be dissatisfied and actively searching for a more effective replacement." (Leech, 1994)*

This research report was based on an investigation on implementing Control Self-Assessment (CSA) concepts in information system development projects in South Africa. Five workshops conducted at Retailer provided measurements on the potential of enhancing the achievement of project objectives and increasing management information on project progress in terms of successes achieved and obstacles encountered.

This chapter aims to clarify the definition of CSA, CSA components, the need for CSA and the control framework in which CSA operates, as well as to outline the background and the need for the research.

1.1 CSA defined

CSA is defined by the Institute of Internal Auditors Incorporated (IIA) as:

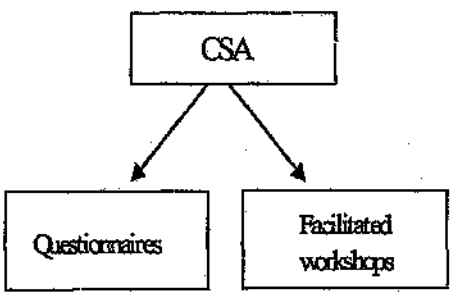
> *"Control Self-Assessment is a technique used to evaluate the effectiveness of business processes by bringing together individuals in natural working groups and focusing the work group teams on the assessment of steps necessary to assure the achievement of business objectives." (Tritter, Zittnan & De Haas, 1996)*

The term "CSA" describes a participative process in which teams introspectively review and assess the processes and procedures applied in achieving their objectives at given intervals, with the objective of enhancing those processes and procedures in order to provide the team with the maximum potential of achieving or exceeding their objectives.

1.2 The components of CSA

Facilitated workshops and questionnaires are the two main components of the CSA process. These entail guiding business unit work groups to analyse their own business risks, control measures and to identify any corrective action steps required. (Baker & Graham, 1996). The basic CSA concept was developed further by Tim Leech, Paul Makosz and Bruce McCuaig while at Gulf Canada Resources in 1987, to include more specific measurements for controlling predetermined business risks.

Figure 1: CSA components



Chapter 2 explains each of these components in more detail. However for clarification purposes the following subsections highlight some of the more pertinent details.

1.2.1 Questionnaires

CSA questionnaires were compiled by internal auditors after doing an initial review of a business area, with the aim of collecting information on the day-to-day operation of the control systems in that area. These questionnaires were normally completed by a work team of staff from the business area and then submitted to the auditor for evaluation and report.

1.2.2 Facilitated workshops

CSA workshops are defined as:

> *"an audit process that uses workshops to personally involve employees in assessing the adequacy of controls and identify opportunities for improvement." (Baker & Graham 1996)*

CSA workshop participants were selected from management and staff members involved in a given business process, in order to achieve a balanced view of the required processes as opposed to what really occurred in the day-to-day operations. The selected participants were brought together at a suitable location and, with the internal auditor as facilitator, they identified the business objectives of the business area under review (Baker & Graham 1996). This part of the process was especially attractive as it blended in with development projects, where these objectives were normally identified at the start of the project and could merely be revisited at the workshop.

Each supporting objective was analysed in the workshop and those issues that were successes or obstacles in achieving the business objectives were identified by the group and listed on a worksheet. Successes were those items achieved by the business unit, that would contribute to meeting the objective, while obstacles hindered or prevented the unit from meeting the objective. Despite the terms used, these were the

controls and weaknesses pertinent to the business unit and included soft issues, such as communication inside and outside the unit.

Workshop participants having been given the listed successes and obstables, rated the level to which the supporting objective was met by secret ballot. An average achievement percentage was calculated, based on the votes and the individual values were reviewed for differences. Significant differences could be an indication that not all the issues had surfaced and been discussed. The process was then revisited and repeated.

Finally all the obstacles identified were analysed and dissected individually by the work group to find suitable measures to manage or remove the obstacles and an action plan was generated.

1.3 Importance of research

This research was important in that it enhanced mechanisms to evaluate progress with IS development projects. In so doing the research:

1. provided top management with a process whereby they could stay abreast of control issues in information system development projects in their organisations.
2. in addition it enhanced the potential for systems development projects to meet or exceed their objectives at a time when the benefits of huge investments in IS projects were questioned by management.

The research aim was to evaluate whether CSA techniques would be suitable for reviewing the status of the control framework for individual IS development projects in an organisation.

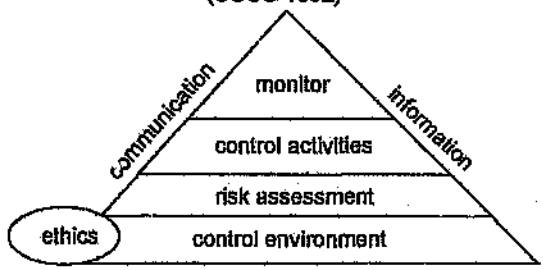
A suitable mechanism should be able to measure all the control components for the business area under review. Five control components were identified in the COSO report. Those control components included both the traditional assurance components

of control [1] as well as the additional control components included in the COSO report.[2]

The five interrelated components as identified in figure 2 were as follows:

1. The control environment which described the ethics applied in the business and the guidance provided to employees by management for completing their daily tasks.
2. Risk assessment encompassed the daily undertaking of calculated business risk for reward and the assessment of those risk exposure levels.
3. Measures applied by an organisation and all its employees to mitigate risks to acceptable levels were included under control activities.
4. Monitoring was the continuous measurement of business activities against objectives.
5. Information and communication required every unit of the business to be suitably informed in order to be able to meet its objectives efficiently.

Figure 2: COSO Framework
(COSO 1992)



The control environment and information and communication components were difficult to measure with assurance audit verification techniques. (Munter 1995). An alternative measurement mechanism was needed to meet corporate governance requirements.

[1]Referred to as formal controls in this paper.

[2]Referred to as informal controls in this paper.

The control components cited above were all relevant to IS development projects. A CSA mechanism for systems development was also needed to enable management to evaluate the IS development projects in their organisations. Such a mechanism had to conform to the CSA basics of being a participative process to evaluate the control systems.

> *"People are far more likely to embrace needed changes when they are involved in the assessment process." (Leech 1997)*

A separate mechanism could be required for information systems projects because:

1. large amounts of time and funds have allocated to the project for extended periods of time, that normaliy exceed a financial year.
2. the major impact a system could have in gaining or exceeding the strategic advantage in relation to competitors.
3. the high risk of total project failure present, should only a few of the potential risk exposures occur.
4. of the high relevancy of informal risks such as communication, leadership experience, interpersonal conflict and others.

1.4 Aims and objectives of the research

The aim of this research was to test existing CSA questionnaire and workshop techniques on information system development projects at Retailer in South Africa, as a part of the overall project management system. The objective was to identify a practical mechanism that would enable project teams to measure risks and controls to issue control statements to support top management with their corporate governance duties.

To satisfy the aims and objectives of the research the following research questions were posed:

1. *What Control Self-Assessment techniques can be applied in measuring the success of Information System development project stages in South Africa in the retail industry?*
2. *Why are these techniques successful or not?*

1.5 Conclusion

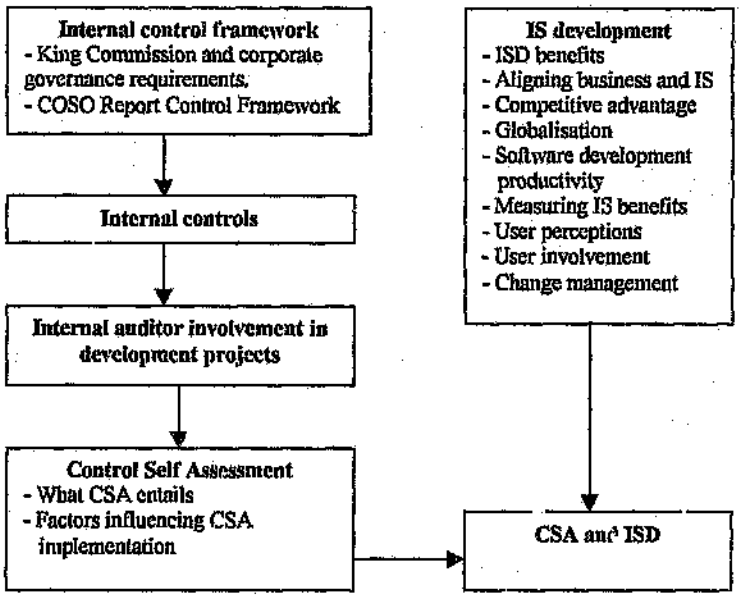
This chapter clarified the definition of CSA, CSA components, the need for CSA and the control framework in which CSA operates as well as outlining the background and need for the research. Chapter 2 reviews literature on CSA and systems development. The research methodology is described in chapter 3. Data gathered during the research is analysed in chapter 4, management recommendations are made in chapter 5. In chapter 6 the research findings are summarised and conclusions are drawn.

Chapter 2: LITERATURE REVIEW

2.0 Introduction

Chapter 1 highlighted the need for the research. Chapter 2 will describe the background which gave rise to the need to develop a CSA model for systems development. It will review the report issued by the King Commission and other international corporate governance[3] requirements. It will scrutinise the contributions of internal auditors to projects, discuss internal control measures and review relevant literature on Information Systems development projects. The chapter structure is illustrated in figure 3:

Figure 3: Literature review



[3]Corporate Governance is the system through which organisations are directed and controlled. Boards of directors are responsible for the governance of their organisations. (COSO, 1992)

2.1 Internal Control Framework

2.1.1 King Commission and corporate governance requirements

The King Commission in South Africa was appointed with the aim to investigate corporate governance in South Africa in comparison to international standards. (King 1994). At the same time the Commission intended to place orate governance on an internationally comparable level, thereby assisting international companies to expand into the South African market. The South African economy had been re-admitted into international markets and needed investment from international businesses to grow.

The major recommendations in the Commission's report were accepted by the Johannesburg Stock Exchange and would be phased in gradually. These recommendations stated that management was responsible for the systems of internal control and had to ensure business risks were managed down to an acceptable level through internal controls. The Directors' Report and the Annual Financial Statements should include a statement that effective systems of internal control had been maintained in daily business operations. If the directors had any doubt about the ability of the company to continue as a going concern in the year ahead they should also express such doubts.

Failure to issue this statement could result in the JSE suspending a company from the board. Directors making such a statement without ensuring their controls were indeed sufficient, could render themselves liable for losses suffered by stakeholders in the organisation. The researcher expected that these requirements would result in company directors requesting all managers in their organisations to submit regular reports on the maintenance of adequate systems of control in their respective areas of operations.

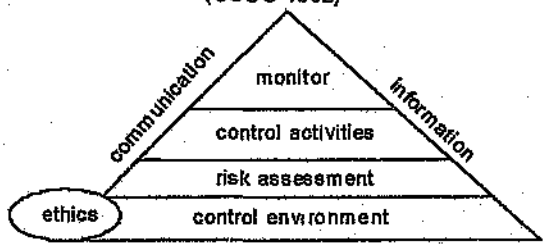
This statement required directors to implement a system which would inform them of the state of the internal control system and of any weaknesses in that system. This statement also generated the need for this research. Currently there is no such system specifically for IS development projects and the researcher believed that CSA could

provide a mechanism on which the directors could base their opinions to issue the required statement. The King Report however did not prescribe a control framework, which left South African business dependent on the results of the COSO report.

2.1.2 COSO report control framework

The Committee of Sponsoring Organisations (COSO) of the Treadway Commission in the United States was more prescriptive than the King Report in that it provided an internal control framework for reference. This framework consisted of the five interrelated components, illustrated below. These will be discussed later.

Figure 4: COSO Framework
(COSO 1992)



The foundation of the COSO control components was the control environment which sets the framework in which the other control functions had to operate. These took into account the ethical values, integrity, competence, management style and culture of the organisation. (COSO, 1992)

COSO required that risks related to specific business objectives be measured and managed. Internal controls had to be effected to give reasonable assurance that business objectives could be achieved in terms of:

- the effectiveness and efficiency of operations
- reliability of financial reporting
- compliance with laws and regulations

Control activities were those formal procedures, checks and balances designed to control daily business operations. These included authorisations, reconciliations, segregation of duties and others.

Other elements were information and communication, which were not formally measurable control components. Communication in an organisation could not be checked and verified with traditional audit methods of checks and balances. To complicate matters even further, COSO made it clear that this component included cross functional, up and down flow of information inside the organisation, information about external events and communication to make staff understand their roles and impact on the organisation.

The final component in the COSO framework was monitoring, which was the continuous checking and reporting on internal controls and their performance. This requirement placed the responsibility for maintaining the control system with management and staff, requiring them to monitor it and to report on it frequently to top management.

The CSA workshop process by Baker and Graham (1996), discussed in chapter 1, was based on the COSO Internal Control Framework with its five control components. Management and staff could take ownership of and review the status of their internal controls by applying CSA. CSA provided a means of measuring the informal components (information and communication), but most of all it motivated people to take the controls seriously as they understood their roles much more clearly (Baker & Graham, 1996).

IS development project managers were not exempted from corporate governance and had to ensure that their projects were controlled adequately in all five control framework components and that suitable internal controls were applied.

2.2 Internal controls

Literature provided many definitions of internal control. However, the following two definitions were selected for their relevance.

> *"The policies, procedures, practices and organisational structures designed to provide reasonable assurance that business objectives will be achieved and that undesired events will be prevented or detected and corrected."* (Cobit, 1996)

and

> *"A protective action, device, procedure, technique, or other measure that reduces exposure."* (Ruthberg & Tipton, 1993)

The Information Systems Audit and Control Foundation published "Cobit: Control Objectives for Information and Related Technology" in 1996 to provide a standard auditing framework for IS auditors. Organisations had to safeguard their assets, including information, and balance their resources to meet the objectives of the business.

> *"Management has to decide what to reasonably invest for security and control in IT and how to balance risk and control investment in an often unpredictable IT environment."* (Cobit, 1996)

Internal control systems utilised resources and had to support business processes in reaching their objectives. This required an optimum between risk and control investment to ensure management was discharging its fiduciary duties effectively.

> *"Enterprise is the disposition to engage in undertakings of risk. Business is the undertaking of risk for reward."* (King Commission, 1994)

A certain measure of risk would therefore always be present in all business ventures, including systems development. An optimal system of internal controls should provide development projects with a reasonable potential to achieve success, by limiting those factors that could impact negatively on the project, to levels acceptable to corporate stakeholders. It could be difficult for project managers to decide on acceptable levels of exposure, and to apply adequate internal controls to

achieve such an optimum control system. Most corporations have internal audit departments what can provide assistance, evaluate the control system and express independent opinions on the adequacy and efficiency of internal controls in place.

2.3 Internal auditor involvement in development projects

Internal auditors are required to review business processes and report their findings to the Board of Directors or to their audit committee, and other stakeholders. (IIA, 1978) These business processes include information systems in production and under development. IS auditors review and report on Information Systems in production and under development at the various stages of a project, in accordance to the requirements of the "Systems Auditability and Control Report" (IIA, 1994) and "Cobit" (ISACF, 1996).

These auditors however have to retain their independence, so they can express an unbiased opinion on the systems and processes they review. This impartiality is normally achieved by not allowing an auditor who was involved in developing a system to audit the same system again, or by performing peer reviews on any such audits.

Cobit (1996) guided information system auditors on determining whether a system of risk assessment was operative and how those risks were to be managed to acceptable levels. The Association's requirement for a risk assessment methodology was stated clearly and included the proviso that methods other than calculations might be required. This provided a base for CSA to be applied to information systems in general as a qualitative measurement.

> *"A qualitative analysis is necessary when it is inappropriate or impossible to measure value in monetary terms."* (Ruthberg and Tipton, 1993).

The researcher felt that the COSO component 'Information and Communication' was one such condition and CSA was the qualitative analysis that could be applied as measurement technique. The CSA process promoted and facilitated this measurement

technique through structured participation by the auditor, as a control consultant and facilitator in the project team, and the participants deciding on the results generated.

2.4 Control Self-Assessment (CSA)

CSA is defined by the Institute of Internal Auditors Incorporated (IIA) as:

> *"Control Self-Assessment is a technique used to evaluate the effectiveness of business processes by bringing together individuals in natural working groups and focusing the work group teams on the assessment of steps necessary to assure the achievement of business objectives."* (Tritter, Zittnan & De Haas, 1996)

Application of this definition to IS development projects would, in the researcher's opinion, imply that project teams could form work groups to evaluate the effectiveness of the processes used to achieve the project objectives.

2.4.1 What CSA entails

Control Self-Assessment is a technique involving a team of people, working within a business process. As a group, they evaluate the risks and controls within that business process. The evaluation could be done by the team members individually e.g. completing questionnaires, or as a group e.g. when discussing controls and risks in a workshop. In 1995 Jordan found that CSA was implemented primarily through using workshop techniques.

> *"70% of the respondents are using some form of work team self-assessment, 17% use surveys or questionnaires, and 13% assess based on management produced analysis not solicited from a work team."* (Jordan, 1995)

CSA implementation should occur in five stages, starting with gaining management's

support and commitment through marketing CSA and its benefits. That should be followed by planning a set of CSA workshops in a particular area by obtaining the objectives of that business unit. Workshops should then be conducted to analyse the objectives, the results reported and action plans developed.

2.4.2 Factors influencing CSA implementation

The research report 'Control Self-Assessment: Experience, Current Thinking and Best Practises' by Tritter, Zittnan and De Haas for the Institute of Internal Auditors (1997) listed the major pitfalls to avoid in CSA implementation.

The greatest danger was in using people who were unskilled in human dynamics or who did not believe in the concept, as these peopled controlled the proceedings and to a large extent were responsible for putting participants at ease and obtaining their commitment to the process.

Implementing CSA workshops required thorough planning, research and a large investment in training. Specialised equipment should be marketed aggressively as a large portion of the implementation budget could be expended on such equipment.

Implementation of CSA had to be done on a sliding scale starting with small projects and gradually escalating into larger or more complex areas. The successes achieved with these projects should be promoted throughout the business to increase management's commitment to the process. Without management support for and commitment to CSA the process would be a futile exercise.

The factors discussed above should be addressed at organisational level. Once applied to an organisation as a whole, they should no longer threaten implementation of CSA techniques into IS development anymore.

Factors unique to IS development that could threaten the success of implementing CSA were not identified in literature. An overview of IS development and the environment in which it occurred, was essential in order to gain an understanding of the role IS had to play in modern business and how CSA could be applied to assist

management in leveraging the potential benefits generated from developing new systems.

2.5 Information system development

2.5.1 IS development benefits

IS development benefits have to be realised through planning, allocation of resources and control of activities in order to construct the object, within certain time and budget constraints. In the past resources had been invested in some IS development projects without the eventual realisation of proposed benefits.

"ISD has simply swallowed money" (Remenyi D, 1993, p27)

IS Departments would have to apply technology to gain a strategic advantage over competitors for a certain period of time. As such advantage was eroded with time, the department would have to have the next system ready to again increase the advantage. Strategic and operational planning and adherence to that planning would gain significance and could be critical to the survival of a particular business. Large and small businesses have started to revert to their core business e.g. retailing. In the process, costly and inefficient IS operations were outsourced. According to Kumar (1990) the industry would have to measure itself by post-implementation evaluation of systems. Survival of in-house IS departments in a global society would depend on the ability to communicate with users and to provide timely business solutions through sound business principles, management and control.

It is essential for corporate business and IS strategies to be aligned, so that investments in technology will support changing business objectives. Simply aligning strategies is not sufficient and supporting structures must be created for the process to succeed. The alignment requires supporting departmental infrastructures, changed business processes, flexible platforms and a cultural environment eager for change. These are required to ensure that the envisaged benefits can be achieved.

Sound management disciplines have to be applied by IS management to ensure that organisations reap optimum benefit from their IS investments. Business attitude towards IS management is changing in that investments in technology and systems will have to be justified by tangible and measurable benefits to the organisation. Business efforts to achieve reduced overheads in order to allow them to compete without tariff protection, will force IS to deliver systems more effectively than in the past. Inefficient IS departments not meeting business needs, could have their functions outsourced or their budgets severely restricted. Productivity in IS would have to be enhanced dramatically, to enable organisations to sustain their activities. This productivity could only be enhanced if IS aligned itself with business and delivered the systems and functionality required, when needed.

2.5.2 Aligning business and IS

The alignment of IS to the business strategy contains both internal and external issues. External issues describe the business environment in which the company competes, while internal issues relate to decisions on company resources and organisational structures, as identified by Venkantraman et al (1993).

> *"The business arena in which the firm competes"*

and

> *"The logic of the administrative processes".*

The organisational structure of the IS department should be revised according to the requirements of the business and the joint strategy. Through addressing both these areas, a successful alignment process would ensure that the structure of the IS department and the management of IS resources would support the overall strategy. Internal conflicts between business units and IS could be reduced by pre-empting user requirements and forging closer ties with users. Both business and IS have to be transformed, in order for the strategy to succeed.

A change of strategy by an organisation has to be accompanied by changes in the business process and the way in which the organisation conducts its business.

Business processes currently in use were not designed for optimal use of IS and should be changed to gain efficiency and effectiveness.

Simply aligning IS and business strategies, without using the opportunity to re-engineer the business processes, would result in under-performance in the marketplace.

> *"In particular, heavy investments in information technology have delivered disappointing results - largely because companies tend to use technology to mechanise old ways of doing business."* (Hammer, 1990)

Through following the approach to change the business processes, an organisation could learn to adjust to change quickly and to deliver expected advantages. Businesses who are able to change their processes, systems and even products rapidly, could react sooner to changing markets and could leverage IS to stay ahead of the competition.

2.5.3 Competitive advantage

Competitive advantage could be gained through organisations applying technology combined with business perspectives. Technology would not then simply support the business, it would actually drive business changes and opportunities, by providing the means to gain an advantage in the market.

> *"The organisational capabilities to leverage technology to differentiate its operations from competitors".* (Venkantraman 1993)

To achieve that advantage an organisation must be able to implement such changes before its competition. Specific milestones and plans must be formulated by joint business and IS teams in order to measure progress and complete specific tasks on schedule. The strategies have to be converted into action plans. Performance must be

measured continually to ensure specific milestones are achieved on time and for the ultimate perceived benefits and advantages to be attained.

> *"Until recently, most managers treated information technology as a support service and delegated it to EDP departments."* (Porter and Millard, 1985)

Technological advances and the reduced cost of processing data into information has changed the above perception as organisations became more dependent on their processing abilities. Organisations with the ability to utilise opportunities presented by advances in technology could create strategic advantages over their competitors. These advantages would be eroded with time and would have to be replaced frequently in order to maintain the organisation's leading position in the marketplace. Rapid development and deployment of IS functionality are necessary to maintain any strategic advantage. Rapid deployment of these strategic systems requires synergy between business and IS goals and objectives in order to, to enable an organisation to change within short time frames.

> *"Thus strategic alignment is not an event but a process of continuous adaption and change."* (Venkantraman and Henderson, 1993)

The time frame within which these changes are be effected is critical for maintaining market position.

> *"The best competitors, the most successful ones, know how to keep moving and always stay on the cutting edge. Today, time is on the cutting edge."* (Stalk, 1988)

Changes in business strategy to survive competition would require IS to develop and implement application systems in much shorter time frames. The quicker IS could provide business with the tools to create or grasp an opportunity, the more likely the organisation would be able achieve and sustain strategic advantage over its competitors. More emphasis on reducing time frames in the linkages of the value

chain would result in more pressure on IS to develop high quality application systems across value activities.

> *"In fact, as a strategic weapon, time is the equivalent of money, productivity, quality, even innovation."* (Stalk, 1988)

A business cannot afford to let IS deliver systems later than scheduled or at a much higher cost than anticipated. A larger number of strategic systems would have to be delivered more quickly at reduced cost, for a business to maintain its market position, which would not only be threatened by the local competition, but also by international businesses. Corporations and smaller businesses use various computer networks including the Internet to gain access to and to expand into new markets. This globalisation would introduce severe competition to markets where only those businesses who could adapt and change quickly enough would be able to survive.

2.5.4 Globalisation

The markets in which organisations compete are opening to international players through reductions in tariffs and advances of technology. These changes would create opportunities in new areas, such as third world countries. It would also change the way in which organisations compete and manage their activities. Even products would be changed through technological advances.

> *"Globalization has already produced dramatic changes in key markets, major competitors and products"* (Ives and Jarvenpaa, 1991)

Organisations would want to compete and survive in these global markets against increasing numbers of competitors. Often, particularly in the case of South African companies about to enter these markets, these competitors would be more experienced and would have already adapted their operations accordingly. Late entrants would have the opportunity to learn from the mistakes of their competitors, and to implement systems and structures correctly the first time.

Strategic information systems in a multinational organisation should address issues to make information available to business across the various cultures, hardware platforms or application systems. By aligning IS with global business strategies, the organisation could implement efficient management practices to adapt quickly to change and to react and manage any exceptions in their global operations. Uniform control structures would be required to ensure that all operations supported the business goals and objectives and that optimum benefit would be achieved through economies of scale.

> *"Because control systems affect all areas of the corporation, changes in them inevitably affect strategy and organisational structure."* (Bruns and McFarlan, 1987)

Organisations applying technology to their control systems would find themselves operating more effectively through better and faster information reporting to management. Timely, complete and accurate management information would enable the correct options to be selected and decisions to be made more quickly on more complete information. These opportunities would be expanded through enhancing control automating control systems. Structural changes could be effected to make the control function more cost-effective.

Information power and applying IS to generate accurate, complete information in time for management to decide on the correct course of action is vital for sustaining multinational organisations. These changing business information requirements would increase the number of new systems that would need be developed in less time with the same or less resources. IS and business management would have to manage and to increase IS development productivity by whatever means or measures available.

2.5.5 Software development productivity

Limited resources are available to any organisation for reinvestment and the benefits from investing in IS must be substantiated in order for management to allocate significant portions of these resources to IS. These quantified benefits would have to

exceed the cost of the investments to convince management, but clear measurement guidelines have not yet been applied freely in business.

> *"Information is closely bound up with the control of other resources. It is intangible and its value is subjective, yet it is vital to the successful running of the enterprise."* (Silk DJ, 1990)

This statement highlights the fact that the value of the information provided by IS is the key to evaluating system benefits. Standard management techniques should be supported by standard development processes in order to enhance the extent to which IS development activities could be measured and compared to other business units.

> *"The key to overall software productivity is a defined, agreed, repeatable and measurable process."* (Moignard, 1995)

That uniform process is clouded by the selection of tools and techniques available in system development. These would include client-server technologies, joint application development, prototyping, modeling, data warehousing, and etceteras. IS has to develop a range of standard processes dealing with each of these techniques which it could call on, should a project require any of these techniques. This standard process would have to be refined and updated continually to ensure that it met the needs of the organisation.

> *"New development techniques that are designed to meet the pressures of bringing new products and services to the market quicker, are being introduced frequently."* (Robinson, 1995)

Lead times in systems projects would have to be shortened in order to enhance the rapid response abilities with which IS could address business requirements. Aligned IS and business strategies, supported by an organisation's ability to adapt quickly to changes in its environment, would be crucial for the future successes of that company. It would also be critical to measure the stated objectives and benefits of a project with that which was actually achieved. Systems should be measured according to the extent to which it had achieved business requirements in a timely fashion.

2.5.6 Measuring IS benefits

A corporate standard should be applied to select the correct measurement technique, the stage in the system life, at which measurement should be performed, should be determined as should be the optimum sample size. Various techniques have been developed to measure IS benefits in business organisations.

> *"Approaches that have been advocated include MIS usage estimation, user satisfaction, incremental performance in decision making effectiveness, cost-benefit analysis, information economics, utility analysis, the analytical hierarchy approach, and information attribute examination."* (Srinivasan A, 1985)

Systems being developed have to state the operational, tactical or strategic business objectives that it intended to support or achieve. The value of these objectives to the organisation should represent the value of the system to the organisation when justifying the investment. The extent towards which these objectives would be achieved could be measured after the system design has been specified. Ultimately user satisfaction and knock-on benefits have to be measured after system implementation.

Investments in Information Systems would return tangible, measurable benefits as well as intangible or immeasurable or so called soft benefits. Tangible benefits could be quantified and measured objectively, but the intangible benefits would often be ignored in business.

According to Peters, (1988) the benefits could be divided into three categories, that is:

1. Benefits associated with enhancing productivity such as headcount reduction, working capital improvements, processing economies, general efficiency improvements
2. Benefits associated with business expansion such as consolidating existing markets, creating new opportunities

3. Benefits associated with risk minimisation such as improvements in quality, minimising unaccounted losses, reducing risk of failure or shutdown, minimising risk of litigation, minimising loss of profitability, variability in the business profile, minimising loss of market share.

Measuring the intangible benefits is a complex issue and alternative measures have been developed as surrogates in an attempt to quantify the value of these benefits versus the investment cost in monetary terms. Two of these methods, "Usage Estimation" and "User Information Satisfaction" are discussed briefly under the following two sub-headings.

1. Usage estimation

Usage estimation attempts to measure the frequency with which systems are used as a surrogate to quantify system effectiveness. The theory was based on the assumption that higher systems usage would result in a higher level of user satisfaction. In 1985 Srinivasan found that usage frequency did not correlate to the user requirements and systems success would depend on the level of features provided to the user. These features had to be sufficient to enable users to meet their objectives, but sufficiently limited to provide the system at the most economic cost to the organisation.

2. User information satisfaction

Different development methods with varying responsibilities for users and Information Systems Departments, have been used by various companies and organisations. A uniform measurement process should be identified that will provide comparable results across these development methods.

User information satisfaction (UIS) attempts to measure tangible and intangible benefits of the different methods by measuring user perceptions as a surrogate in a uniform measurement processes. Users are the business people for whom systems were being designed and implemented in order, to meet specific business objectives and to provide certain business functionality.

Therefore by implication a system with satisfied users would be one that meets or exceeds those business requirements it set out to provide. UIS should therefore provide comparable results of the effectiveness of the IS department across various platforms and methodologies.

Enhanced, accurate, complete and timely information would, allow management to control business variables to achieve optimum business performance.

> *"The value of perfect information is the value of the optimal strategies which would result from perfect understanding and prediction of the behavior of uncontrollable elements."* (Andrus RR, 1971)

The perfect business strategy would out perform all competitors and achieve maximum profitability at minimum cost. Management's perception of the value of information to be generated by a system would determine the development priorities and the level of management support and commitment that the system would be given. Higher priority systems would receive more commitment from users to stay involved in the development process, in order to ensure system success.

For the perfect business strategy, management would require perfect information to enable them to make the right decisions, to exploit the right opportunities and avoid the right risks. The value of the information available to the business and its management through its IS investments should be compared with and measured against the perceived value that perfect information would have for the business. The extent to which the business would rely on IS to achieve its business objectives and strategic objectives would represent the benefit, value gained by investing in IS. That reliance could be measured by quantifying user satisfaction by means of a system.

"The way in which a user of information perceives its source, format, focus, and so forth, is the real determinant of the value of information." (Andrus ,1, 1971)

The value of an information system should equal the perceived value of the information generated by that system to its users.

2.5.7 User perceptions

User perceptions about systems can be measured by questionnaires on certain aspects of individual systems. The general user attitude reflected by these would indicate the effectiveness measure achieved by the development project. Information system users would go about their daily business with objectives to complete a number of critical tasks, thereby ensuring successful careers for themselves in the organisation.

"Systems deemed to be both important and personally relevant are likely to engender positive affective or evaluative feelings." (Barki and Hartwick, 1994)

User tasks are usually defined in job descriptions or agreed upon with management. The importance of any particular information system to the user would be the level which it would assist in or distract from completion of these tasks as best as possible, in the shortest possible time. A relevant, reliable system with accurate, complete and timely information would be rated much better than one which was not available at any certain time or one which provided incorrect information or one which was viewed as interfering with the time available to complete critical tasks.

Incomplete or inaccurate information presented to users would reduce significantly the reliance placed in a system by the users. Compromised data integrity could lead to users making incorrect decisions and not achieving their objectives as discussed above. Information could be complete and accurate, but could be interpreted differently by various people in an organisation.

Systems with integrated data structures, containing sufficient information, interpreted through similar business paradigms would less likely leave some users confused or uncertain.

The system objectives, as defined in the specifications should be static, while business requirements should change and grow almost on a daily basis. A smaller system that could be developed quickly would more likely reflect a positive UIS than a very large system developed over a number of years. Similarly users would be more likely to have positive feelings about systems if they have been involved in developing those systems and if they have the opportunity to specify their requirements. Continually changing system specifications could however expand a project to such an extent that they might not be implemented.

2.5.8 User involvement

Users who were not involved in the system development process at all would be presented with an unknown tool, when a new system was implemented. They would not have had an opportunity to specify their requirements, nor would they have been consulted to determine their interface preferences. In 1994 *Barki and Hartwick* found that

> *"it was primarily when users performed IS development assignments and activities that entailed responsibility that feelings of high involvement and positive attitude occurred."*

This would indicate the need for user involvement throughout the development of a system. It would also suggest that user representatives involved in the development process, would have a more positive attitude towards a system, than those users who did not have similar opportunities. An optimal level of user involvement would have to be found for each project. However users might keep changing their requirements, thereby causing a project to fail to deliver the system on time.

Smaller projects where key users would be involved in specifying and testing the requirements should have a larger potential to achieve the stated objectives successfully. There would however always be large development projects extended

over a long period that would impact negatively on user perceptions. Users who have not been involved in developing a system, or whose perceptions and expectations have been impacted negatively by a long development period would have to be coerced into accepting changes to their business processes caused by a new system, by means of careful change management.

2.5.9 Change management

People will resist change to the processes to which they are accustomed, unless they can be convinced that change does not present a risk to them. They have to be convinced that the new strategy would present them with opportunities to grow and expand their reference frameworks.

> *"Advocates of bold new strategies have not recognised that they must first 'uncouple' the functions from the vicelike grip of past strategies".* (Hobbs et al, 1977)

The changes brought about by strategic alignment invariably impact on the organisation culture. These impacts must be managed carefully to ensure that the changes would be effected in such a manner that people would be empowered by the process and that they would be eager to use the new systems and methods.

> *"Managers with a committing style engage people in a journey. They lead in such a way that everyone on the journey helps shape its course."* (Mintzberg 1994)

Technocratic drivers of change through technology might visualise opportunities, but might ignore how people go about their daily tasks. The organisation culture should promote a sharing of information, while allowing people to become owners of their respective processes, so that they could drive change themselves in order to meet strategic objectives.

Drastic change is traumatic and could result in more damage to the organisations' work force than the potential benefits, unless it is managed appropriately. The culture

of the organisation has to be measured and managed to accommodate the dramatic changes necessitated by a major development project or Business Process Re-engineering (BPR). A dedicated change management agent with sufficient status and political power would be essential. Such an agent has to create opportunities for people to recognise that the existing operations could be improved. He/she has to allow them to take part in the process and offer them the opportunity to learn new skills. He/she has to co-ordinate the actual change and finally assist people in settling down in the new innovative business process. The objectives for the change agent should be to assist individuals through the change process, towards gaining and living a new shared set of common values.

2.6 CSA and IS development

A variety of factors and pressures on IS development to deliver systems more quickly and more frequently with the same or less resources have been discussed. These pressures could tempt IS management to allocate insufficient resources to maintain internal controls, which could result in unacceptable risk exposure levels. Internal controls should still be applied in the control framework elements (as discussed in item 2.1.2), in order to manage risk exposures down to acceptable levels, and to ensure that project objectives were met.

Time constraints on an IS development project under severe pressure to deliver a project could threaten the implementation of CSA on such a project. CSA techniques would probably also fail where adequate control systems have not been maintained, as team members could view disclosure of such control weaknesses as a threat to their careers. The CSA workshop technique concentrated on measuring the extent to which project objectives were being met, by quantifying the perceptions of those developers and users involved in developing the project.

IS departments have to meet user information requirements within time and resource limits through controlled and measured development processes aligned with the business strategy and objectives. Standard management practises would have to be applied to measure IS development productivity and progress. CSA would be one

such technique to measure tangible and intangible benefits and to report to management on project progress or lack there of.

2.7 Summary and Conclusion

This chapter described the background from which the need to develop a CSA model for systems development was born. It reviewed South African and International Corporate Governance requirements, the contributions made by internal auditors to projects, internal control measures and relevant literature on Information Systems development projects which described the need to measure IS projects. Chapter 3 reviews the research methodology used.

Chapter 3: RESEARCH METHODOLOGY

3.0 Introduction

Chapter 2 reviewed relevant literature. This chapter poses the research question and describes the process followed to gather, analyse and interpret data. The research process conducted is illustrated in figure 5 on the next page.

3.1 Aims and objectives

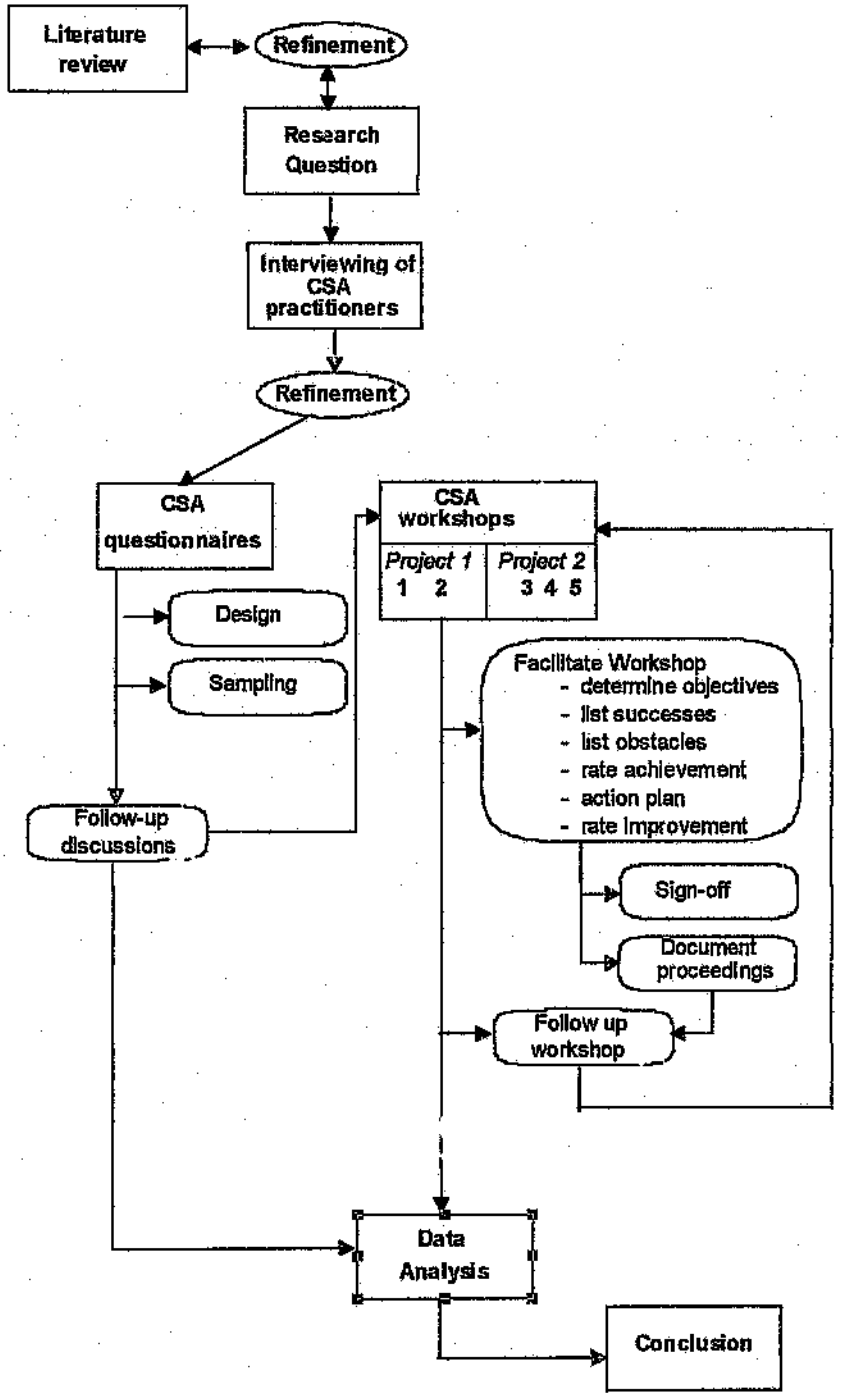
The aim of this research was to validate existing CSA questionnaire and workshop techniques on information system development projects at Retailer in South Africa, as a part of the overall project management system, with the objective to identify a practical mechanism that would enable project teams to measure risks and controls and issue control statements to support top management with their corporate governance duties.

In satisfying the aims and objectives of the research the following research questions were posed:

1. *What Control Self-Assessment techniques can be applied in measuring the success of Information System development project stages in South Africa in the retail industry?*
2. *Why are these techniques successful or not?*

An initial literature review in 1996 revealed very little literature on CSA. The research had to be updated continuously as relevant literature became available. The information obtained was amplified by visiting two companies in the United States of America that had implemented CSA successfully. Factors that could threaten any CSA implementation were obtained during these visits as was information about CSA questionnaires and CSA workshops. Questionnaires were then designed and experimented on an IS project, but these failed. Follow-up interviews revealed the reasons why the failure occurred. Five CSA workshops were held.

Figure 5: Research Methodology



3.2 Research Paradigm

A qualitative research approach was followed in an effort to evaluate and interpret non-tangible enhancements to IS projects, gained from applying CSA techniques.

> *"Standard qualitative designs call for the persons most responsible for interpretations to be in the field, making observations, exercising subjective judgment, analyzing and synthesizing, all the while realizing their own consciousness."* (Stake, 1995)

The qualitative approach was considered appropriate because of the extensive involvement of the researcher in implementing CSA techniques on IS development projects. The researcher's interpretation of the results achieved from applying CSA techniques was an integral part of this research, but could be perceived by some as a limiting factor.

> *"The particular moment when data gathering begins. It begins before there is commitment to do the study: backgrounding, acquaintance with other cases, first impressions."* (Stake, 1995)

A relatively small number of six CSA implementations on IS projects were completed at Retailer and the results obtained were reviewed. Hermeneutic and interpretive study principles were applied as the results could be unique to South Africa, unique to the retailing industry, unique to Retailer or unique to a particular system or development phase of a system. A quantitative measurement was applied with workshop participants voting to express their opinions on the extent to which project objectives were achieved. The results gained from this voting was however a subjective measurement.

3.3 Interviewing CSA practitioners

US companies practicing CSA were identified with the assistance of Mr Tim Leech who presented his CSA concepts in South Africa at the time. Two of these companies, Georgia Pacific and Bell South, were contacted and asked whether they would discuss their CSA experiences with the researcher. Appointments were set up and confirmed in writing by

facsimile with Mr Andrew Twaddell and Ms Glenda Jordan respectively. The interviews were aimed at supplementing on the CSA information gained during the literature review. Further information on any potential factors that could threaten or impact CSA implementation was also sought.

3.4 Refinement

Four material factors that could threaten successful CSA implementation were identified when visiting US companies, which corresponded closely with those identified by Tritter, Zittnan and De Haas in 1997. These were as follows:

1. Auditors who have to implement CSA have to be trained in people skills in order to improve communication with team members.
2. Internal auditors have to discard of the perception of auditor arrogance.
3. Mutual trust has to be developed between internal audit and members of the project team.
4. Company cultures have to change to foster openness, honesty and integrity between departments and individuals.

These following factors were addressed before CSA implementation was attempted.

1. The researcher completed an in-house facilitator training course at Retailer to enhance his people skills.
2. In discarding of the arrogance perception the smart casual dress code accepted as standard for IS staff at Retailer was adopted by CSA audit staff.
3. IS projects for applying CSA techniques were selected for good relations that had been developed with key individuals in the past.
4. Retailer committed itself to implementing CSA and encouraged ethical business practices.

3.5 Questionnaires

CSA questionnaires were used with the objective to measure project progress at specific checkpoints and for achievement of project objectives. The following subsections reviewed the design of the questionnaires, the sampling process followed and the follow-up discussions held on these questionnaires.

3.5.1 Design of questionnaires

Questionnaires were designed by the researcher based on Control Objectives (IS Audit and Control Foundation, 1992). Each questionnaire incorporated the Development Process Objectives, Business Objectives, Self-Assessment Objectives and a list of questions on the various internal controls applicable to the specific development stage of the project. Some questions required detailed information, while others required merely a 'Yes' or 'No' as an answer. (A specimen questionnaire is included as appendix 6). The questionnaires were reviewed by the IS auditors and the data architect at Retailer. Their suggestions were incorporated before the questionnaires were finalised and handed to the project team members for completion.

Nine questionnaires (refer example in appendix 6) were designed for use at checkpoints where projects were evaluated at Retailer. These checkpoints were as follows:

1. Initial review
2. Project scoping
3. Package evaluation
4. Facilities review
5. Processing rules
6. Prototyping
7. Develop to production standard
8. Installation and training
9. Post-implementation review

3.5.2 Data collection and sampling of questionnaires

The researcher selected planning package project to test the questionnaires, because of:

1. the relatively small size of the project.
2. the project was still in its early stages without severe time pressures.
3. good relations existed between Internal Audit and the individual team members.

A presentation to introduce the questionnaires and explain their purpose was made to the complete project team consisting of the project leader, user champion, four users and five technical specialists.

All project team members were asked to complete and return the questionnaires to the researcher for evaluation of the project status, risks and controls within three weeks. This was followed-up in a project meeting when no responses were received within the three weeks.

3.5.3 Follow-up discussions on questionnaires

Individual follow-up discussions lasting fifteen minutes each were conducted with team members. The user champion, project manager and two technical specialists were interviewed to determine why the CSA questionnaires had not been completed. No transcripts were kept as the same answer was given by each interviewee, that is the questionnaires did not enhance the project's potential for success.

This led to the questionnaires being aborted, and CSA workshop techniques being introduced.

3.6 CSA facilitated workshops

CSA workshops were conducted by a team, with the auditor acting as facilitator. The project objectives were determined from specification documents and confirmed by workshop participants. Information was gathered from all team members on the specific successes and weaknesses (controls and risks), in order to obtain a balanced overview of the project. Action plans were negotiated and effected within the project team in order to address any unduly high residual risk exposures. After the completion of the initial evaluation, the auditor withdrew from the project to a certain extent so that the project team could specify and develop the system. At given stages through the System Development Life Cycle (SDLC) the risk analysis and action plan were revisited by the project team in order, to identify and measure any changes that could have affected the residual risk level. (Baker & Graham, 1996)

Five CSA workshops were conducted at different project development phases of two package implementation projects, as listed in table 1.

Workshop	Project	Development phase
1	Distribution System Phase 1	Post-implementation review
2	Distribution System Phase 1	Follow-up post-implementation review
3	Financial System	High-level gap analysis
4	Financial System	Operational analysis
5	Financial System	Solutions design

Table 1: CSA workshops completed

3.6.1 The CSA workshop process

Workshops were conducted by facilitating project team members through a standard agenda that consisted of:

- introducing CSA, the agenda to be followed and the sign-off certificate.
- determining the project objectives for the project phase.
- recording project successes.
- recording obstacles that detracted from achieving the objective.
- rating achievement of the objective with the recorded successes and obstacles.
- defining remedial actions for each obstacle and compiling those actions into an action plan.
- rating the desired achievement of the objective as if the action plan had been implemented.

Workshops 2, 4 and 5 also reviewed the action plans generated in previous workshops in order, to measure progress achieved by implementing remedial steps. Achievement of the objectives were rated again and compared to the ratings of the first workshop.

The workshops varied in length from two hours up to seven hours. The results were recorded on flipcharts. These were displayed for the duration of the workshops and were transcribed afterwards. Executive overviews for the workshops were written by the project managers to put the detail results into perspective and to express their own opinions on the workshops. All documents generated were bound into booklets and issued to all participants and other relevant parties in the organisation. These documents are included as appendixes 1 to 5.

3.6.2 Workshop participants

Workshop participants varied from workshop to workshop, but included the key people involved in the project as reflected in table 2. This table was not added across as the same people could have been present in a number of workshops.

Participants	Workshop				
	1	2	3	4	5
Project management	1	1	1	1	1
User management	1	1	1	1	1
Developers	4	3	7	7	9
Users	10	7	2	3	5
Totals	***16***	***12***	***11***	***12***	***16***

Table 2: Participants by workshop

3.6.3 Rating achievement of objectives

Secret ballots were used to obtain an opinion from each workshop participant on the degree to which the objectives had been achieved. Participants voted on blank pieces of paper instead of on preformatted ballot papers. A Likert scale of 1 to 7 was used to quantify achievement, with 7 representing perfect achievement and 1 representing no achievement. This scale was part of the CSA methodology presented by Baker and Graham (1996) and was adopted without change. The scale was explained to workshop participants each time a rating was done. No difficulties were experienced at the workshops as participants generally voted for the middle path.

Rating	Description
7	Objectives are consistently exceeded and there are no obstacles.
6	Objectives are consistently met and sometimes exceeded. There are only a small number of obstacles.
5	Objectives are normally met and successes exceed the obstacles.
4	Above average achievement of objectives. More successes than obstacles.
3	Below average achievement of objectives. More obstacles than successes.
2	Objectives are seldom achieved and obstacles outweigh successes.
1	Objectives are never achieved, no successes could be identified and a large number of obstacles have been listed.

Table 3: Likert Scale

The standard voting scale was used to obtain comparable ratings from the various workshops on different projects. Individual votes were opened in the work hop and compared with the aim of identifying any votes that deviated significantly from the others. Such a deviation could indicate unresolved obstacles or a misunderstanding of issues or the voting mechanism. Deviations that did occur were discussed with the participants and attempts were made to identify the underlying cause by revisiting successes, obstacles, voting mechanism, action plan and finally by pointing out the sign off-certificate.

3.6.4 Sign-off certificate

All participants were informed at the start of each workshop that they would be required to sign a certificate stating that:

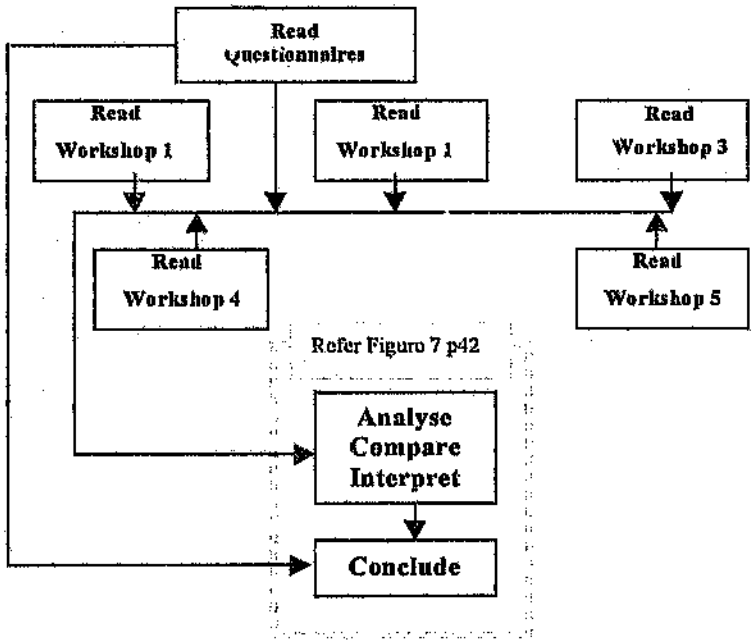
> *"After implementation of the attached action plan, we hereby certify that, to the best of our knowledge, the system of internal controls is adequate and the project sufficiently documented, to provide reasonable but not absolute assurance that the project phase objectives, benefits and critical success factors should be achieved and related risks monitored and managed to acceptable levels."*

Appendix 7 provides an example of a sign-off certificate. These certificates were included in the CSA workshops to ensure that all participants commited themselves to the process and took ownership of any remedial action steps listed in the action plan. All participants signed these sign-off certificates without objection.

3.6.5 Data analysis

The process followed to analyse and interpret the data is illustrated in figure 6, which contains a summarised block referenced to figure 7 in which the evaluation and interpretation of processes are detailed.

Figure 6: Data analysis



The CSA questionnaires and the documents generated at the five workshops were studied in order to identify common factors. The various sections of these documents were then compared individually to identify similarities in content with specific attention being paid to the objectives, symptoms reflected in successes and obstacles and finally the results of the voting. The results were summarised and compared with the executive summaries for confirmation. An unexpected benefit of early conflict resolution was considered. The impact

of the sign-off certificates on the success of the workshop process was analysed. These results and documents are discussed and interpreted in chapter 4.

3.7 Summary and Conclusion

This chapter posed the research question and described the process followed to gather, analyse and interpret data. The data gathered is analysed and interpreted in chapter 4.

4. Chapter 4: EVALUATION OF FINDINGS

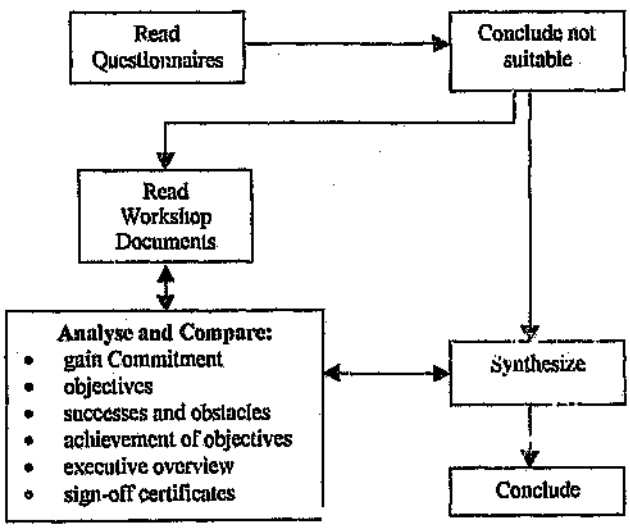
4.0 Introduction

The research methodology was reviewed in chapter 3. When examining the results of the research it would be useful to retrace the aims and objectives of the research. The research was aimed at identifying which CSA techniques could be applied to measure the success of an IS development project phases and why these techniques were successful or not.

This chapter will review the CSA techniques applied, i.e. that of the questionnaire and the workshop. Some discussion is presented on the techniques utilised and the relative successes and failures. The reasons for questionnaires failing are analysed briefly. Analyses of the workshops are presented by examining and interpreting the processes followed and results generated according to the workshop agenda, for all five workshops.

The discussion and evaluation process of the evidence is illustrated in figure 7 below.

Figure 7: Evaluation of data



4.1 Questionnaires

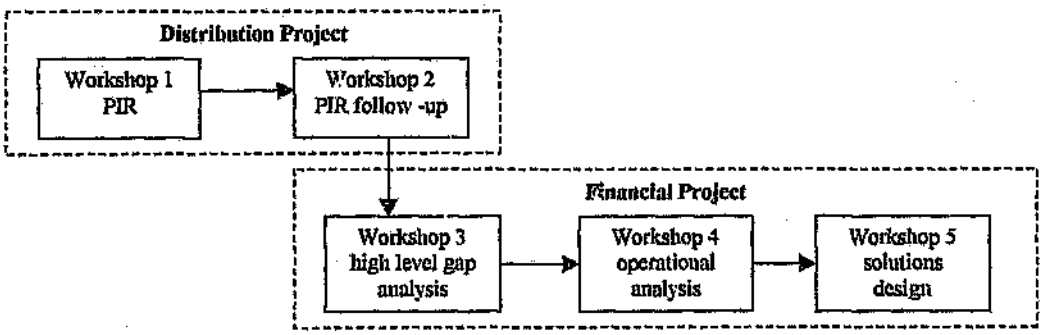
In chapter 3 the process of questionnaire distribution and collection was discussed. The outcome of this process was not successful. The Planning project team did not complete any questionnaires even though the project manager had asked for their assistance. All the interviewees stated that the questionnaires did not provide them with any tool or functionality that would enhance their potential for achieving success with the project. On the contrary, the questionnaires were perceived to place an additional paper burden on project team members, as they would consume time that could have been spent more productively on developing the system. The questionnaires therefore did not support team members in achieving their objectives, instead they became obstacles that prevented them from focusing exclusively on these objectives.

As the questionnaires were not successful, they had to be discarded to a large extent. The questionnaires were however utilised, although not in the functionality as a questionnaire. Instead they served as a checklist to guide workshop facilitators to ask relevant, probing questions in the workshops.

Discarding the questionnaires prompted experimentation with workshop techniques and provided an indication of the importance for a CSA technique to support project teams in gaining their objectives or enhancing the potential to achieve those objectives. This was utilised in the workshops by identifying objectives first, as discussed in section 4.2.2.

4.2 The CSA workshops

Figure 8: Workshops completed



CSA workshops were conducted at different stages of two systems development projects. The first workshop was a post-implementation review (PIR) of the Distribution project. The second workshop was a follow-up of the first one and reviewed progress achieved with the action plans generated in the first.

Workshops three to five were conducted on the Financial project. Workshop three was conducted on the completion of the high level gap analysis phase of the project in which the Financial package was compared to the business requirements. The fourth workshop was conducted a month later after on the completion of the operational analysis phase of the project in which detailed business processes were mapped to system functionality. The fifth workshop was completed three months later on the completion of the solutions design in which recommended solutions were made to address differences between business processes and the system. Workshops four and five reviewed the progress achieved with the action plan compiled in the previous workshops, before proceeding with the normal workshop agenda.

The following areas of discussion relate to the results obtained from the five workshops and the analyses and interpretation of those results.

4.2.1 Gaining project manager commitment

Meetings were held with the project managers before the workshops were conducted. The Distribution project's project manager was tasked to perform a PIR on his project plan. The researcher's offer to perform this task on his behalf was accepted as it saved the project manager the time he would have spent preparing for the PIR and generating PIR documents. It was agreed with the Project Manager of the Financial project that documents generated in the workshops would be used to report to the project steering committee.

These agreements eased some of the project managers' administrative duties and also provided project managers with benefits that supported their personal and project objectives. These benefits were crucial for gaining the full support and commitment from project managers, by overcoming their initial scepticism that the workshops would not be beneficial for them or their projects.

The workshop also provided the project managers with independent facilitators at no charge to the projects. The facilitators were not involved in the development projects and the project managers could be convinced that the workshops would be conducted without paradigms or hidden agendas that could skew the proceedings or results. Using the facilitators provided the project managers with opportunities to participate in the workshops at the same level as the other team members, instead of having to facilitate the workshops. This allowed project managers the opportunity to contribute to the content of the workshops, which would have been difficult if they also had to facilitate the workshops.

The possibility of the project managers leaving the workshop if the facilitators had the perception that team members were unwilling to discuss their concerns or problems with the project managers present, was considered and discussed with the project managers. This option was not used in any of the five workshops, but would have been useful if team members were unwilling to participate fully because of problems with the project manager or project management style. Attempts were made by both facilitators to identify that possible problems were being withheld by participants by listening carefully to remarks made and by reviewing participant ratings for large differences. No such hidden problems were found however. This use of the participants' ratings on the Likert scale is discussed in more detail in section 4.2.5.

Both project managers indicated that they wanted to review the workshop documentation before it was distributed. The CSA workshop documents, together with the executive summaries, were distributed to top management which included the project steering committee, some directors and executives. The project expressed concern that some of the readers could misinterpret some of the contents, which could lead to unjustified perceptions that the projects were not progressing on schedule or were not being managed properly. The project managers were then requested to write an executive overview not exceeding one A4 size page. This executive overview served to summarise the workshop and to sketch briefly the circumstances surrounding the project. The intention was to put the contents into perspective for the readers, that is the directors, executives and staff members involved with the project. This overview enabled project managers to provide the said readers who did not have an intimate knowledge of the project, with sufficient background to enhance their understanding of the contents of the workshop documents. This limited the questions directed

by top management to the project leaders on the status of the project, again assisting them to focus their energies on the project objectives.

The initial meetings to introduce the CSA workshop process and principles, prior to the actual workshops, were essential in order to obtain an understanding of the project managers' duties and requirements. This participation enabled the researcher to provide a service to the project managers by assuming some small portion of their workload, over and above the expected benefits that the workshops could have for the projects.

4.2.2. Gaining team member commitment

Workshops proceedings were started by introducing the facilitators and explaining the CSA process and workshop agenda for the workshop agenda has been discussed in previous chapters of this research report.

The process and agenda were explained to provide participants with an explanation of the process and the reasons why it followed, thus enabling them to contribute to the workshop and gain the greatest benefit as individuals and as teams. Participants were informed in advance that the workshops would focus on the project objectives and about the certificates they had to sign. This enabled participants to perceive clearly their roles within the framework. It also gave them more assurance that the workshops would enhance their potential for success. Participants were informed that the facilitators were from the internal audit department. Some initial resistance was encountered in the first workshop of each project (workshops 1 and 3) from participants, despite assurances that the facilitators were not auditing the project and would not issue formal audit reports. This resistance was overcome as follows:

1. Project managers communicated and displayed their obvious support.
2. Participants understood the workshop process better
3. Some humour was interjected into the proceedings to relax participants
4. No facilitator opinions were forced on the participants
5. Participants were informed that the workshop documents would reflect only what was agreed upon in the workshop, with nothing added or removed and by applying this principle to all workshop documents.

Subsequent workshops did not present this participant resistance. This was perhaps because participants had experienced the benefits of the workshops which overcame their initial scepticism and resistance to change.

4.2.3 Project objectives

Once commitment was gained and all stakeholders and participants in the workshop understood explicitly the workshop process and their roles therein, the next step on the workshop agenda was to identify the project objectives for the particular phases on which the workshops were held. This confirmed the goals to which the teams were working and served to focus the discussions on issues relevant to those objectives. It also enhanced the perception that the workshops were conducted to enhance the teams' potential for success and therefore encouraged team members to participate fully. The objectives for the Distribution and Financial projects are discussed in the next two subsections.

1. Objectives for the Distribution project (workshops 1 and 2)

The objectives for the Distribution project are listed in table 4 below. Detailed objectives were set for the Distribution project at inception and were taken from existing project documentation. The objectives were discussed and workshop participants confirmed that these were correct before proceeding to the next step. These objectives appeared to be very comprehensive and ranged from desired project benefits for the business to specific deliverables for the project team. Project team members knew what they had to strive to achieve and what the desired benefits were for the business. These benefits clearly outlined the project with little room for misinterpretation.

Objective 1 To attain pre-defined core goals	Objective 2. To achieve key output milestones	Objective 3. Achieve benefits to customers
• Improved picking and packing	• Systems specifications, development, testing and documentation	• Get rid of unpack and check
• Financial and unit accuracy	• Training on system and documentation of procedures	• Improved chain stock information integrity
• Improved management information	• Equipment and Environment	• Improved customer service at stores
• Higher throughput capacity	• Operationalise	• Reduced pipeline stock
• Increased pick rate	• Project and milestone management	• Reduce lead time SLA to 6 days
• 90% in 6 days	• Implementation	

Table 4: Distribution project objectives workshops 1 and 2

Well into the workshop participants discovered that two of the objectives could not be achieved, because the responsibility lay outside the powers of the project team. This was discovered when the successes and obstacles for the individual objectives were discussed. The objectives were retained and not removed as the participants felt that they were desired benefits of the business leveraging the new system, even though they were outside the project team's area of responsibility.

These two objectives mentioned above were *'Get rid of unpack and check'* and *'Improved customer service at stores'*. The first of these two objectives addressed the Unpack and Check process, which was the process in stores whereby merchandise cartons were opened, unpacked and the contents checked. It was the responsibility of store management and the project could not remove it. Store managers aimed to receive the correct quantity and style merchandise to achieve their objectives of high turnover with minimal stock losses. The project team did not have authority to amend that process and it was viewed as a failure by some of the users in the workshop. The system implemented by this project did however provide added functionality and enhanced accuracy that enabled store management later to remove the store unpack and check process. Removal of this process significantly reduced

store staffing costs, which was not clearly stated initially as a desired indirect business benefit for the project.

Similarly the project team had no direct responsibility for customer service in stores and could not directly impact on such. Again some users viewed that as a project failure, while acknowledging that improved accuracy of merchandise style, colour and size information could enhance customer service. The system provided the functionality that enabled business management to implement a customer help line, through which merchandise items could be obtained from other stores for customers.

This illustrates the need for system development project teams to be very precise when defining project objectives to ensure that those objectives are:

1. aligned to business strategy
2. attainable within the given time and budget
3. inside the projects' area of authority and responsibility
4. directly related to the project.
5. indirect benefit that could be achieved should be described as such separately.

It also demonstrated the suitability of reviewing project objectives in workshops by highlighting inadequate or ambitious objectives that could have contributed to perceptions that the projects were not successful.

2. Objectives for the Financial project (workshops 3, 4 and 5)

The objectives for the Financial project were obtained from the project manager before the workshops and were reviewed and confirmed by workshop participants. These objectives were stated in terms of items to be completed for each phase of the project whereas the Distribution project benefits also included desired business benefits as the system was already completed and implemented. The Financial project consisted of phases different to those identified for the questionnaires in section 3.5.1. because it was a package implementation project and not an in-house developed system, with resultant different objectives. Workshops were completed on the first three project phases which did not yet deliver direct business

benefits. These benefits would only materialise much later in the project life cycle. The following workshops were conducted in accordance with the project plan:

Workshop 3: High Level Gap Analysis (Project Phase 1)

Compare the Financial package at a macrolevel to the business requirements to determine gaps between package functions and business processes, with the following deliverables:

1. Map ideal process to new system
2. Identify gaps between current business and new system
3. Identify function, procedural and technology gaps
4. Recommend action plan

Workshop 4: Operational Analysis (Project Phase 2)

Map detailed business processes to system functions to identify specific gaps by generating:

1. Business processes
2. A detailed GAP analysis, with recommended solutions
3. System interface requirements
4. Data conversion requirements
5. Report requirements
6. New procedures requirements
7. Flex-field requirements
8. Set-up parameter requirements
9. Application access / responsibility

Workshop 5: Solutions Design (Project Phase 3)

Recommend solutions to address gaps identified in the previous two phases between business processes and the package functions by delivering:

1. Application setup
2. Reports
3. Interfaces
4. Data conversion
5. User procedures
6. Test scripts
7. Technical procedures

These objectives listed the items to be delivered for each phase and no problems were highlighted by the workshops. They did not describe the scope of the project, but no scope problems were experienced in the workshops because the project was a package replacement of a legacy system with a fixed scope.

A suggestion for management is to conduct earlier workshops on identifying and clarifying project objectives that is at the start of IS development projects. This could prevent misconceptions about projects meeting their objectives. Further study and investigation is required to confirm this perception.

4.2.4 Workshop successes and obstacles

This section aims to analyse and compare project successes and obstacles in order to highlight any informal control issues as previously discussed in section 1.3, thereby validating the suitability of workshops to identify and address informal control issues. Team members were encouraged by project managers and facilitators to share their opinions with the rest of the team. It was made clear that the workshops were not about individual performance, but about finding adequately controlled processes with minimal obstacles to provide environments in which the projects had the highest potential for success.

Participants discussed all successes and obstacles with the facilitators only having to intervene to keep the discussions relevant to the issues or to ask clarifying questions. Differences of opinion did sometimes occur. The differences were resolved by team members discussing them, clearing misunderstandings and finding solutions acceptable to the team and not just acceptable to specific individuals. All successes and obstacles agreed upon by the team were recorded on flipcharts and relayed back to the team by the facilitator asking participants to confirm every item written on the flipcharts. Flipcharts were pasted on the walls for the duration of the workshop where participants could refer to what was recorded at any time.

The project manager's support, discussion of successes and obstacles, constructive resolution of differences and flipcharts enabled a free flow of relevant information from participants. This information contained areas of risk to the project and included some informal control issues that could impact on the perceived project success or failure, which would not have

been identified using normal audit procedures. This clearly indicated the benefit of this particular technique of CSA. Examples of these informal control issues are provided in table 6. The table illustrates the symptoms which the issues caused or the impact they had on the projects.

Issue	Symptoms
1. Information sharing and communication	• Guidance from project leaders • Acceptance of specifications by Operations people • Staff involvement in progress meetings • Communication with USA • Team members got to know one another better • Information requested from other projects.
2. Project management	• Team lived up to what they were saying • Disciplined, documented approach to phase • Team stayed focused • Under-utilisation of staff
3. Management support	• Good executive sponsorship and director involvement • Project manager could become involved in project owner issues • Good business co-operation • Decisions awaited from business areas
4. Change control	• People objective was key success • Not enough training • Management involvement to operationalise • Lack of change management • Users open to new ideas

Table 5: Non-tangible issues identified

Participants identified these issues as the workshops provided the structure within which they were empowered to discuss their perceived needs in a controlled environment without fear for retribution. As a result nothing was held back and participants raised all the issues they considered supported the project as well as all issues they thought could threaten the project. This was the primary benefit of the workshop process as it empowered team members to address issues that could threaten their project, which issues could be considered as being outside their sphere of responsibility.

Project managers gained additional assurance where these symptoms were raised as successes and were forewarned about any obstacles that came to light in the workshops but might not

have surfaced during the normal day-to-day project operations. This allowed the project manager and team members to be proactive in addressing concerns before they became major obstacles that could threaten to derail the project. Frequently workshop participants knew how to address concerns, but were reluctant to do so. This could have been out of fear that it could be perceived as meddling or because they felt it was not their responsibility. The workshop action plan gave these team members the authority to take remedial action steps and to find solutions, where needed.

Both participants and project managers perceived this process as beneficial to the project processes. This was also reflected in the evaluation of the extent towards which project object were being achieved.

4.2.5 Achievement of objectives

In evaluating the success or otherwise of the CSA process and techniques utilised in the process, it is worthwhile to examine whether or not the proposed project phases were deemed successful or not. In order to ascertain this, an examination needed to be made of the attainment of the objectives of each of the respective systems. The following section aims to examine the achievement of the system objectives.

The potential to achieve the project objectives has been improved to some degree by the workshops. This was confirmed in the ratings achieved from the team members voting, as listed in the tables 7 and 8 below. These tables detail each of the objectives highlighting the *actual* versus *desired* change. The results are separated between the Distribution project (table 7) and the Financial project (table 8). A separate follow-up had been done on the Distribution project workshop, whereas the Financial project was reviewed in a series of workshops.

Distribution Project	Workshop 1 Actual %	Workshop 1 Desired %	Workshop 1 Change %	Workshop 2 Actual %	Workshop 2 Change %
Objective 1	70,7	91,7	+21,0	87,7	+17,0
Objective 2	68,6	87,9	+19,3	66,3	-2,3
Objective 3	54,1	83,6	+29,5	68,3	+14,2
Average	64,5	87,7	+23,2	74,1	+9,6

Table 6: Achievement of Distribution Project objectives

The results of Distribution project participants' voting are reflected in table 7, which consists of the perceived actual achievement of objectives at the first workshop, the desired achievement and the change represented by the difference between them. The ratings reflected for workshop 2 are the actual achievement after implementation of the action plan and the change achieved from the actual achievement in workshop 1. The participants, at the time of the workshop, rated that the project was, on average, only achieving 64,5% of the objectives and that the action steps listed in the action plan could enhance that by 23,3% to achieve 87,7%. When the follow-up workshop was done four months later, the average achievement had improved with 9,6% to 74,1%. If objective 2 had been omitted from the equation, the other two objectives would have improved with an average of 15,2%.

The decrease in objective 2 was explored in the follow-up workshop. It was found that the objective addressed project deliverables, which had already been completed and could not be changed. Identification of these obstacles however enabled the project team to take corrective action steps before the system was implemented at two other locations. This benefit could not be quantified as similar CSA workshops were not performed on the other two implementations.

The CSA workshops were beneficial to this project even though they were only applied at the PIR phase. Significant improvements were achieved, but the researcher feels that it could have been even greater if the workshops had been conducted earlier on in the project. Earlier workshops on the Distribution project could have enabled the team to address obstacles found with their second objective.

Three workshops were conducted on the Financial project, each with only one objective as discussed under item 4.2.2. The voting results for the Financial project are reflected in Table 8.

Financial Project	Actual %	Desired %	Change %
Objective workshop 3	76,0	86,0	+10,0
Objective workshop 4	80,0	94,0	+14,0
Objective workshop 5	71,0	89,0	+18,0
Average	75,7	89,7	+14,0

Table 7: Achievement of Financial project objectives

The ratings reflected in table 8 consist of the actual achievement of objectives for each workshop, the desired achievement and the desired change. The format differs from table 7 as each Financial project workshop reviewed only one objective and included the review of the previous action plan. Separate follow-up workshops were not conducted on the Financial project as was done in the case with the Distribution project. Such a separate follow-up workshop would only be required after the post-implementation review workshop.

The results from these three workshops showed significant improvement in the achievement of the objective of each project phase, with an average increase of 14,0%. Significant increases in achievement of the objectives were identified in all the workshops and no problems were experienced with objectives beyond the team's area of responsibility. The participants indicated improvements and stayed committed to the workshops despite their tight schedules and heavy workloads. They clearly indicated that the workshops added value to the project. In the executive overviews the project leaders further supported this perception further.

These CSA workshops were as beneficial to this project as they were to the Distribution project and in the researcher's opinion probably more so, as the workshops had been conducted from the start of the project. This allowed for obstacles to be identified and resolved before they could impact on the project, for adequate informal controls to be applied during the project and for project teams to ensure that their objectives were attainable.

4.2.6 Executive overviews

Previously in this chapter it was mentioned that project managers wrote executive overviews, based on the workshop proceedings and documents, except for workshop 2 for which a summary was not requested as the document consisted of only four pages. These overviews were included in the CSA workshop documents, enabling the project managers to summarise and put the contents into perspective.

The summary for workshop 1 did not state whether the workshop contributed to the project. The project manager did however acknowledge the obstacles identified and recommended that the next implementation phase in Johannesburg be postponed until these obstacles had been resolved. The project manager highlighted a few non-tangible factors in his summary, which were discussed in the workshop. These were:

- an intricate process of leading, following, teaching and learning
- involvement of the widest spectrum of role-players
- challenges and opportunities were tackled with great spirit
- strain caused to users due to incorrect reporting

The project manager's summaries on the Financial project workshops 3,4 and 5 also referred to informal control issues identified in these workshops. The summaries commented on

- the team settling down quickly
- role clarification for staff
- structured approach
- dedicated and focused individual project teams
- cross-communication between teams
- resilience of team members

This was interpreted as acknowledging that the workshop did add value to the project and that these informal control issues were of significant importance to IS development projects. This could be viewed as an element that contributed to the successful application of the CSA workshops. The benefits achieved and lessons learned from these workshops are discussed and synthesised in the next section.

4.2.7 Sign-off certificates

As mentioned previously, at the start of each workshop the facilitator explained the CSA concept and highlighted to the participants that there would be a certificate to sign at the end of the workshop. The purpose of these certificates was to provide assurance to management that adequate controls had been maintained over projects, thus enabling them to sign their corporate governance statements. Facilitators gave participants the assurance that these certificates would not to be used to take any disciplinary measures against any team or individual team member.

It was stated that participants had to raise all issues that they were be aware of that could either enhance or threaten the potential for the project team to achieve their objectives successfully, before they signed the certificates. The certificates were circulated at the workshops so that all participants could familiarise themselves with the wording they were about to sign. (Appendix 7 provides an example of such a certificate). The psychological effect of these certificates was not analysed, but the researcher gained the impression that it put participants at ease and empowered them to express all their concerns.

The signed certificates were handed to management and were reported on in the internal audit reports to the audit committee, providing them with the assurance that the projects are controlled adequately. This enabled them to sign corporate the governance statements.

The above discussion details the relative successes and obstacles experienced with the various techniques implemented in the CSA process. Chapter 5 will summarise these findings and translate them into management guidelines for those wanting to undertake the CSA process. Chapter 5 will also detail some unexpected benefits and findings which were identified in the CSA process.

4.3 Conclusion

The CSA questionnaires were not successful, but the workshops met and even exceeded some expectations. Each of the five CSA workshops added value to the projects and assisted project managers and team members alike to enhance the potential for achieving their objectives on time and within budget. It contributed to the IS development control framework in providing the mechanism whereby corporate governance certificates were signed. These benefits were achieved at a relatively low investment of time and funds.

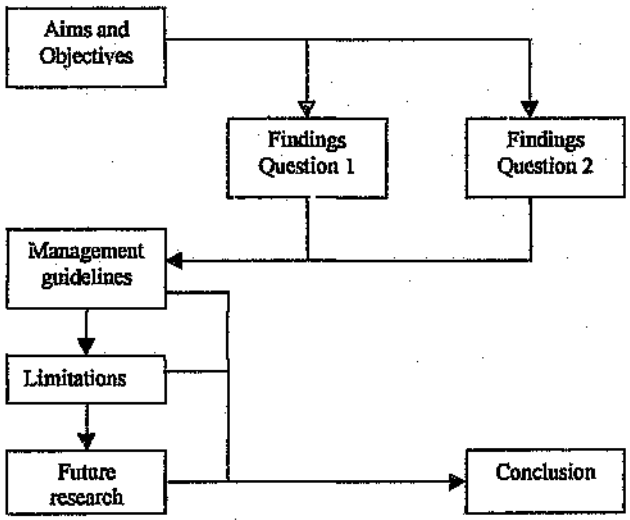
There are however limiting factors inherent in this study and the interpretation of the results achieved. These factors, management recommendations and suggestions for further study are discussed in chapter 5.

Chapter 5: SUMMARY AND CONCLUSION

5.0 Introduction

Chapter 4 analysed and evaluated the data gathered during the research. This chapter summarises the research conducted by reviewing the aims and objectives and findings on the research questions to determine management guidelines. The limitations of the research and items for future research conclude this chapter. The process followed is illustrated in figure 8.

Figure 9: Summary and conclusion



5.1 Aims and objectives of the research

The aim of this research was to test existing CSA questionnaire and workshop techniques on information system development projects at Retailer in South Africa, as a part of the overall project management system. The objective was to identify a practical mechanism that would enable project teams to measure risks and controls and issue control statements to support top management with their corporate governance duties. Two

research questions were posed to satisfy the aims and objectives of the research and these are discussed in the next two sub-sections.

5.2 Question 1: What Control Self-Assessment techniques can be applied in measuring the success of Information System development project stages in South Africa in the retail industry?

The research evaluated both CSA questionnaires and workshop techniques. The questionnaires were not completed by the project team members despite being asked to do so by the project manager. The researcher therefore concluded that the CSA questionnaires were not suitable to evaluate IS project development stages, which prompted evaluation of CSA workshop techniques.

As the questionnaires were not successful, they have were discarded to a large extent, but have proved useful as checklists to guide workshop facilitators to ask relevant, probing questions. Discarding the questionnaires prompted experimentation with workshop techniques.

The CSA workshops identified project successes and obstacles in relation to project objectives, thus evaluated the risks and controls. These successes and obstacles included non-tangible items, such as information and communication that could be difficult to quantify.

The CSA workshops were successful in measuring achievement of project phase objectives on a Likert scale, providing management with a technique to quantify the potential for a project in order to achieve its objectives. Sign-off certificates were signed by all participants, providing management with the assurance that the projects were controlled in accordance to corporate governance requirements. In addition the workshops provided a mechanism to rectify risks through generating action plans and providing opportunities to resolve conflict constructively.

The CSA workshops therefore met all the requirements posed in the research question and provided additional benefits not envisaged initially. The CSA workshop technique appears to be a suitable mechanism to measure project risks and controls and evaluate the extent towards which project objectives are achieved. The reasons for this success are discussed in the next section.

5.3 Question 2: Why are these techniques successful or not?

Team members expressed the opinion that the questionnaires placed additional time constraints on them, without it benefiting the project. The questionnaires were not successful because the project team members perceived them as an administrative burden that added little or no value towards enhancing their potential for success.

The workshops were successful as they were perceived by project managers and team members alike to add value to the projects. The documents generated by the five CSA workshop relieved the project managers of some of their administrative duties. They also provided project managers with a vehicle through which they could report objectively on the progress of the project to the respective steering committees.

Team members were provided opportunities to express their concerns without fear of retribution and an arena in which interpersonal conflict could be resolved constructively. The workshops provided team members with the authority, based on an action plan, to take ownership and proactively address issues beyond their normal area of responsibilities. It also provided concise sets of documents that reflected balanced 'snapshots' with both positive and negative project issues at a given date.

The perception of the participants was that the workshops added significantly to the potential for the projects to succeed in achieving the project objectives on time and within budget. Two further possible uses have been identified in addition to the benefits initially envisaged.

5.4 Additional benefits

The workshops could be used to obtain an early indication of the User Information Satisfaction (UIS) and to manage and resolve conflict. These two uses are discussed in the following two subsections.

5.4.1 User information satisfaction

This research did not intend to measure User Information Satisfaction (UIS), but the workshops could be utilised to provide an additional technique for earlier measurement of user perceptions. Users were present in all five the workshops as is evident from the workshop participants listed in table 2. These users were involved in the projects and were aware of the information that would be provided by the new systems. They were also the experts on the information required from the systems in their daily tasks and, as such, played important roles in the workshops by expressing their concerns and requirements. Their ratings on the Likert scale could form an early indication of the eventual UIS that the system would generate.

Further research should be done on keeping separate ratings between users and other participants and identifying relationships between these user ratings in the workshops and subsequent UIS ratings. Automated electronic meeting and voting tools are available through which the rating exercises could have been analysed and classified by type of participant. Analysing the results from individual workshops and comparing results between projects could provide IS management with a standard tool with which to measure IS development productivity.

5.4.2 Conflict prevention and resolution

The nature of the CSA workshops enabled all participants regardless of their rank or status to share their opinions on a wide ranging number of factors that could influence project success. This made it the ideal venue to find and address imminent differences of

opinion or personal irritations that could otherwise have escalated into major conflict between team members.

> *"The data reveal that organizational members gave relationship, process and task-related conflicts that can be highly emotional, can have little potential for quick resolution, and can be very important to the group's members. This can be a recipe for disaster if the conflicts are brought under control and managed."* (Jehn, 1997)

These issues appear to be even more important in IS development where a relatively large number of people who may or may not have worked together previously, need to work together in close contact for extended hours. The researcher's initial fears that raising and discussing these issues or irritations could cause undue friction between team members, were unfounded. Workshop participants entered into these discussions totally open minded and were frequently more critical of themselves than their fellow team members. The facilitator hardly had to control these discussions and issues raised were resolved in an atmosphere of constructive criticism. This atmosphere has to be attributed partly to the sign-off certificate in which team members certified their commitment to ensuring achievement of project objectives on time and within budget.

5.5 Revisitation of the literature review

The literature review identified a number of key issues that were considered in the research. Three of the issues identified as important in the literature did not appear to have or make a direct impact on the actual research findings. The issues were:

1. aligning business and IS
2. competitive advantage
3. globalisation

This could have been as a result of the research being directed at a microlevel to individual projects, while those issues impact IS departments at a macrolevel. The researcher is, however, of the opinion that these three issues were contributing factors that heightened the need for teams to complete their projects on time and within budget and as such contributed to the workshops being successful.

5.6 Management guidelines

- The CSA questionnaire technique is not suited for monitoring ISD projects.
- CSA workshop technique is suitable for monitoring ISD projects and for reporting on the project progress and system of internal controls.
- Addressing the four material factors that could threaten successful CSA implementation, could enhance the potential for success with CSA workshops. These factors are as follows:
  1. Auditors who have to implement CSA need to be trained in people skills to improve communication with team members.
  2. Internal auditors have to discard of the perception of auditor arrogance.
  3. Mutual trust has to be developed between internal audit and members of the project team.
  4. Company cultures have to change to foster openness, honesty and integrity between departments and individuals.
- The workshop format may have to be adapted to suit the needs of project teams, so that the amended format is perceived by teams to add value to their processes.
- Workshops should be participative processes in which empowered team members take ownership and resolve risks to the benefit of the team, the project and the business.
- Workshops should be preceded by meetings with project managers to explain the concept and workshop structure in order to gain the project managers' commitment.
- Possible additional benefits to the team should be identified in advance to enhance the perception of adding value to the project.

- Independent facilitators who are not part of the project team should be used to control workshop proceedings.
- Workshop participants should be representative of all key stakeholders in the project phase being reviewed.
- Sign-off certificates should be applied in all workshops and these certificates should be explained and shown to participants at the start of all workshops.
- Project phase objectives should be confirmed.
- Successes and obstacles should be brainstormed or discussed with probing questions from the facilitators.
- A Lickert scale should be applied to enable participants to rate the extent to which they believe the project processes, with its identified successes and obstacles, will achieve the objectives.
- Action plans should be compiled and participants tasked to address obstacles.
- These action plans should be followed up to determine the progress made in implementing remedial action.

5.7 Limitations of the research

A relatively small number of six CSA implementations consisting of a set of questionnaires and five workshops were completed at Retailer. No responses were received on the questionnaires, while an average of only 13,4 team members participated in each workshop. This is a relatively small sample size from which the results were reviewed. Furthermore it was based upon one company that operates in the retail industry in South Africa.

The researcher's interpretation of the results achieved from applying CSA techniques is an integral part of this research, and can be perceived by some as a limiting factor.

Workshop participants measured the extent to which project objectives were achieved before and after the action plans were developed. The results gained from this voting is

however a subjective measurement. The results could have been influenced by a number of external factors and should be interpreted as such.

These factors could have caused the results to be skewed or could impact on the generalizability of the researcher's interpretation of the results.

5.8 Future research

Further research should be done on keeping separate ratings between users and other participants and identifying relationships between the user ratings in the workshops and subsequent UIS ratings.

Future research into CSA workshops should attempt to find the stages in the development life cycle at which CSA workshops would be most beneficial to IS projects. CSA workshops also need to be tested on a variety of IS projects including in-house developments, packages purchased, prototyping and other techniques and tools that may become available over time

The current CSA workshop format is results-oriented when reviewing progress achieved at any given phase of a project. The opportunity to apply CSA at the start of a phase and thereby aligning team members towards achieving the same set of objectives and critical success factors should be researched to quantify the potential benefits that could be achieved.

This could be further enhanced by researching the potential to integrate CSA workshops into various project management approaches used in different organisations.

5.9 Conclusion

CSA workshops as a management tool add value to ISD projects. They could be used in the face of escalating pressures to enhance ISD productivity, while providing

management with the assurance that ISD projects are controlled adequately in terms of corporate governance requirements.

Corporate governance recommendations identified in chapter 1 included the requirements for management to include a statement in the annual financial statements on whether adequate systems of internal control have been maintained. To achieve this requirement, management must institute a mechanism to keep themselves informed about the state of internal controls in their organisations, including internal controls over IS development projects. The research has shown that CSA workshops can be applied as such a mechanism to provide management with the assurance that adequate controls are being maintained over IS development projects. The research has provided top management with a process through which they can stay abreast of control issues in information system development projects in their organisations. It has also enhanced the potential for system development projects to meet or exceed their objectives in a time when the benefits of huge investments in IS projects are being questioned by management. The research showed that CSA techniques would be suitable for reviewing the status of the control framework, including informal controls, for individual IS development projects in an organisation.

6. References

Andrus RR, *Approaches to Information Evaluation*, MSU Business topics 1971.

Archibald RD, *The history of modern project management*, Project Management Journal, Vol 18 No 4, 1987.

Arditi D and Rackas A, *Software needs for construction planning and scheduling*, Internet, Vol 4 No 2, May 1986

Baker LL, Graham RD, *Control Self Assessment*, Internal Auditor, April 1996.

Baker LL, Graham RD, *Exploiting the Potential of Control Self-Assessment*, Proceeds of the First South African Control Self-Assessment Conference, Johannesburg, 1996.

Barki H, Rivard S, Talbot T, *Toward an assessment of software development risk*, Journal of Management Information Systems, Vol 10, September 1993.

Barry T, *MIS split over hardware for PM*, Datamation, September 1987.

Bergeron F and Raymond L, *Identification of Strategic Information Systems Opportunities: Applying and Comparing Two Methodologies*, MIS Quarterly, Vol 15 No 1 March 1991.

Bentley T, *How much did you say it cost?*, Management Accounting, Vol 72 Issue 9, London, October 1994.

Bleeke JA, *Strategic Choices for Newly Opened Markets*, Harvard Business Review, September - October 1990.

Brown SW and Swartz TA, *A Gap Analysis of Professional Service Quality, Journal of Marketing*, Volume 53, April 1989.

Bruns WJ, McFarlan FW, *Information technology puts power in control systems*, Harvard Business Review, September - October 1987

Byers CR, Blume D, *Tying critical success factors to systems development*, Information & Management, Vol 26 Issue 1, January 1994.

Bytheway A, *Proceedings of the Strategic IS Project Management Seminar*, University of the Witwatersrand, 1996.

Cash JI, Konsynski BR, *IS redraws competitive boundaries*, Harvard Business Review, March - April 1985.

Clemons EK, Row MC, *Sustaining IT Advantage: The Role of Structural Differences*, MIS Quarterly September 1991.

Committee of Sponsoring Organisations (COSO), *Internal Control - Integrated Framework*, Treadway Commission, New Jersey, 1992.

Committee on Corporate Governance, *Final Report*, Gee Publishing London, 1998.

Computer Weekly (1991), as cited by Remenyi D, Information Management Case Studies, p1, London, 1993.

Criteria of Control Board (COCO), *Guidance on Control*, Canadian Institute of Chartered Accountants, November 1995.

Daft RL and Lengel RH, *Organisational Information Requirements, Media Richness and Structural Design*, Management Science, May 1986, as quoted by Goodhue, Wybo and Kirsch 1992.

Davenport T, *Saving IT's Soul: Human-Centered Information Management*, Harvard Business Review, March - April 1994.

Davenport TH and Short JE, *The New Industrial Engineering: Information Technology and Business Process Redesign*, Sloan Management Review, Summer 1990.

Davidson Frame J, *Managing Projects in Organisations*, Jossey-Bass Publishers, 1987

De Geus AP, *Planning as Learning*, Harvard Business Review, Jan / Feb 1988

De Lisi PS, *Lessons from the Steel Axe: Culture, Technology, and Organizational Change*, Sloan Management Review, Fall 1990.

Drucker PF, *The Information Executives Really Need*, Harvard Business Review, January – February 1994.

Gibbs J, Gibson S, *Organizational Effectiveness*, Internal Auditor, Vol LV Issue 1, February 1998.

Goodhue DL, Wybo MD & Kirsch LJ, *The Impact of Data Integration on the Costs and Benefits of Information Systems*, MIS Quarterly Volume 16 Number 3, September 1992.

Goss T, Pascale R and Athos A, *The Reinvention Roller Coaster: Risking the Present for a Powerful Future*, Harvard Business Review, Nov- Dec 1993.

Griffin J, Beardsley S and Kugel R, *Commonality: Marrying Design with Process*, The McKinsey Quarterly, No 2, 1991.

Hagel J, *Keeping BPR on Track*, The McKinsey Quarterly, No 1, 1993.

Hall G, Rosenthal J and Wade J, *How to Make Reengineering Work*, Harvard Business Review, November/December 1993.

Hammer M, *Reengineering work: Don't Automate, Obliterate*, Harvard Business Review, July / August 1990.

Hartwick J, Barki H, *Explaining the role of user participation in information system use*, Management Science, Vol 40 Issue 4, April 1994.

Hayes RH, Pisano GP, *Beyond World-Class: The New Manufacturing Strategy*, Harvard Business Review, January - February 1994.

Henderson JC, *Plugging into Strategic Partnerships: the Critical IS Connection*, Sloan Management Review, Spring 1990.

Heygate R, *Immoderate Design*, The McKinsey Quarterly, No 1, 1993

Hirscheim R, Klein HK, *Realizing emancipatory principles in information systems development: The case for ETHICS*, MIS Quarterly, Vol 18 Issue 1, March 1994.

Hobbs JM, Heany DF, Coupling strategy to operating plans, Harvard Business Review, May – June 1977.

Hooper MD, *Rattling SABRE - New Ways to Compete on Information*, Harvard Business Review, May / June 1990.

Institute of Internal Auditors, *Standard for the Professional Practice of Internal Audit No 100*, 1978.

Information Systems Audit and Control Foundation, *Cobit: Control Objectives for Information and Related Technology*, Information Systems Audit and Control Foundation, Rolling Meadows, 1996.

Ives B, Jarvenpaa SL, *Applications of global information technology: Key issues for management*, MIS Quarterly, March 1991.

Jehn K, *A Qualitative analysis of Conflict Types and Dimensions in Organizational Groups*, Administrative Science Quarterly, September 1997

Jordan GS, *Control Self-Assessment: Making the Choice*, Institute of Internal Auditors, Altamonte Springs, June 1995.

Kader K, *Post-Implementation Evaluation of a Computer Based Information System: Current Practices*, Communications of the ACM, Feb 1990, Vol 33 No 2

Kaplan RB and Murdoch L, *Core Process Redesign*, The McKinsey Quarterly, No 2, 1991.

Kaplan RS and Norton DP, *The Balanced Scorecard - Measures that Drive Performance*,

Harvard Business Review, Jan / Feb 1992.

Karake ZA, *An empirical investigation of information technology structure, control and corporate governance*, Journal of Strategic Information Systems, Vol 1 Issue 5, December 1992.

King Commission of Enquiry, *The King Report on Corporate Governance*, November 1994.

King WR, *How Effective is Your Information Systems Planning?*, Long Range Planning Volume 21 Number 5, October 1988.

King WR, *Creating Internal Markets*, Information Systems Management, Spring 1995.

Kyu Kim K, *User Information Satisfaction Towards Conceptual Clarity*, Proceedings of the 11th ICIS, December 1990.

Leech T, *Control and Risk Self-Assessment: The Dawn of a new Era in Corporate Governance*, MCS Control Training & Design, Ontario, Canada, 1994.

Leech T, *Control & Risk Self-Assessment: The Dawn of A New Era In Corporate Governance (Part 1)*, IS Audit & Control Journal, Volume 1, 1997

Leech T, *Control & Risk Self-Assessment: The Dawn of A New Era In Corporate Governance (Part 2)*, IS Audit & Control Journal, Volume 2, 1997

Leech T, *Control & Risk Self-Assessment: The Fad That Hasn't Gone Away*, CSA Sentinel, IIA Control Self-Assessment Centre, No 3, September 1997.

Levene HA, *Project Management using microcomputers*. Osborne, 1986

Makosz PG, McCuaig BW, *Ripe for a Renaissance*, Internal Auditor, December 1990.

Makosz PG, *Corporate Ethics Evaluation and Development*, A Presentation to the Canadian Centre for Ethics, Gulf Canada Resources Limited, October 1990.

Martinez EV, *Avoiding Large-Scale Information Systems Project Failure: The Importance of Fundamentals*, Project Management Journal, Vol 25 Issue 2, June 1994.

McFarlan FW, *Information technology changes the way you compete*, Harvard Business review, May - June 1984.

Meredith JR and Mantel SJ, *Project management - a managerial approach*, 2nd edition, John Wiley, 1989.

Meyer DW, *Finding the right fit in PM systems*, Business Software Review, March 1986

Miller WB, *Building an effective information systems function*, MIS Quarterly Volume 4 Number 2, June 1980,

Miller J & Doyle BA, *Measuring the Effectiveness of Computer-Based Information systems in the Financial Sector*, MIS Quarterly, March 1987.

Mintzberg H, *The Effective Organisation: Forces and Forms*, Sloan Management Review, Vol 32 No2, Winter 1991.

Mintzberg H, *The Fall and Rise of Strategic Planning*, Harvard Business Review, January – February 1994.

Moignard P, *Trends in Systems Development*, IS Audit and Control Journal Vol 1, Information Systems Audit and Control Association, Illinois, 1995.

Monks RAG and Minow N, *Corporate Governance*, Blackwell Publishers, Oxford, 1995

Munter P, *How Fraudulent Financial Reporting Happens and What COSO Advises Corporate America and Its Auditors*, The Journal of Corporate Accounting and Finance, Spring 1995.

Parasuraman A, Zeithaml VA and Berry LL, *L SERVQUAL: A Conceptual Model of Service Quality and Its Implications for Future Research*, Journal of Marketing, Fall 1985.

Peters G, *Evaluating your Computer Investment Strategy*, Journal of Information Technology Volume 3 Number 3, September 1988.

Pitman B, *Delivering a Product your Client Really Wants*, Journal of Systems Management, Vol 43 Issue 2, February 1992.

Porter ME, Hout T, Rudden E, *How global companies win out*, Harvard Business Review, September - October 1982.

Porter ME, Millar VE, *How information gives you competitive advantage*, Harvard Business Review, July - August 1985

Quinn JB, Doorley TL & Paquette PC, *Beyond Products: Services-Based Strategy*, Harvard Business Review, March-April 1990.

Remenyi D, *Introducing Strategic Information Systems Planning*, NCC Blackwell, 1991

Remenyi D, Money A and Twite A, *A Guide to measuring and managing IT benefits*, NCC Blackwell, 2nd edition 1993.

Reynecke M, *The Role of CSA in Providing Assurance to Stakeholders and the Results of Recent Research*, Proceeds of the First South African Control Self-Assessment Conference, Johannesburg, 1996.

Reynecke M, De Lange L, *Control Self-Assessment and the external auditor*, Accountancy SA, South African Institute of Chartered Accountants, February 1998.

Rivard S and Huff SL, *User Developed Applications: Evaluation of success from the DP Department Perspective*, MIS Quarterly, March 1984.

Roth J, *A Hard Look at Soft Controls*, Internal Auditor, Vol LV Issue 1, February 1998.

Saarinen T, Sääksjärvi M, *Process and product success in information systems development*, Journal of Strategic Information Systems, Vol 1 Issue 5, December 1992.

Selzner P, *Leadership in Administration: A Sociological Interpretation*, as attributed to by Mintzberg H, Harvard Business Review, 1994.

Senge PM, *The Leader's New Work: Building Learning Organisations*, Sloan Management Review, Fall 1990.

Senge PM, *Team Learning*, The McKinsey Quarterly, No 2, 1991.

Shapiro BP, Rangan VK, Sviokla JJ, *Staple Yourself to an Order*, Harvard Business Review, Jul / Aug 1992.

Silk DJ, *Managing IS benefits for the 1990's*, Journal of Information Technology Volume 5, 1990.

Srinivasan A, *Alternative Measures of System Effectiveness: Associations and Implications*, MIS Quarterly Volume 9 Number 3, September 1985.

Stalk G, *Time - the Next Source of Competitive Advantage*, Harvard Business Review Jul / Aug 1988.

Stalk G, Evans P, Shulman LE, *Competing on Capabilities: the New Rules of Corporate Strategy*, Harvard Business Review, Mar / April 1992.

Stalk G and Webber AM, *Japan's Dark Side of Time*, Harvard Business Review, Jul / Aug 1993.

Stake RE, *The Art of Case Study Research*, Sage Publications London, 1995

Strauss D, *Gaining strategic advantage*, Information Technology review, Vol 2 no 3, March 1995.

Streeter DN, *Cost benefit evaluation of scientific computing services*, IBM Systems Journal, Number 3 1972.

Tampoe M, *Project managers do not deliver projects, teams do*, International Journal of Project Management, Vol 7 No 1, February 1989.

Thompson K, McParland P, *Software process maturity (SPM) and the information systems developer*, Information & Software Technology, Vol 35 Issue 6, June/July 1993.

Tritter RP, Zittnan DS & DeHaas DL, *Control Self-Assessment: Experience, Current Thinking, and Best Practises*, The Institute of Internal Auditors Research Foundation, Altamonte Springs, 1996.

Valadares TL, *A stochastic model to control project duration and expenditure*, European Journal of Operational Research, Vol 78 Issue 2, October 1994.

Venkantraman N, Henderson J, *Strategic alignment: leveraging information technology for transforming organizations*, IBM Systems Journal v32, March 1993.

Weis P, *Achieving Zero-Defect Service through Self-Directed Teams*, Journal of Systems Management, February 1992.

DISTRIBUTION SYSTEM PHASE 1

ACTION PLAN	ACTION
1. Bill of Lading upload needs investigation.	**K M J B**
2 Financial reporting aspects need to be completed according to a prioritised schedule agreed with the project leader to restore financial integrity.	**M B K M J B**
3. MOD bug programmed this week 7/4 on live with safety validation.	**J B**
4. Monitor download from mainframe.	**K M J B**
5. Focus on information available for enhanced through-put, lead times, costs and labour utilisation.	**S A**
6. All programmes and changes must be tested and inspected.	K M J B
7. Training on MOD DIF enquiry and Nautilus for Financial.	J J
8. Address stock control Financial knowledge with Technical Services.	K M
9. Information on the freeze / menu problem to be channelled to K Moodley. Recapture when MRWD / Freeze problem occurs. Cause unknown at this stage.	S A
10. Raise GIS resource problems with CMC as we are compromising systems development. Mainframe resources should be available for face to face develop[illegible]nt and testi[illegible]	M B K M
11. Loss control training to be done.	J J
12. Dump chute IST to be attended to.	C D
13. Mainframe Development and Test databases should be identical.	K M J B
14. Integrated and Volume testing must be done as early as possible in project. Team testing between GIS and rest of project team.	K M
15. Operator scheduling orders to schedule according to FIFO where possible. User discipline to be addressed to sort out FIFO according to the order status reports.	R G
16. Finalise agreements with suppliers on maintenance in conjunction with users.	K M
17. Increase Group skills on calculating and specifying of file server capacities.	K M B S
18. Investigate separate mainframe initiators. Investigate possible file contention between Durban and Johannesburg.	K M J B
19. Further investigate smudging of labels.	S A
20. Fine tune throughput for higher scan hit rate. Investigate slowing down something or increasing scan rate - latest scanners on market have not been proven anywhere.	S A K M
21. Maintain Systems TAG activities thoughout implementation phase.	K M D M
22. GLF must come up with criteria on which UPC can be measured.	K M
23. Plan to enhance UNIX skill levels to reduce dependencies.	K M
24. Put user manual into [illegible]ZO system and let manuals evolve over project duration, in agreement with users, based on flowcharts with detailed descriptions.	K M
25. In process of doing systems documentation. Administration and Accuracy user manuals to be completed.	K M
26. Document and test Business Resumption Plan and get Internal Audit sign-off.	K M M B
27. Internal Audit to be involved in specification sign-off and project team meetings.	K M

DISTRIBUTION SYSTEM PHASE 1

PRIMARY OBJECTIVE

To implement a system that will enable UPC to meet specified core goals by re-engineering the picking and packing processes to deliver improved throughput, increased accuracy, reduced lead times and costs, and paperless processing.

SUPPORTING OBJECTIVE 1

To attain pre-defined core goals:

- Improved picking and packing through Pick-to-Light and Paperless processing.
- Financial (99,8%) and SKU (99%) Accuracy per carton.
- Improved management information on Labour requirements, Individual performance, Accuracy information and Service levels by Process area.
- Higher throughput capacity, reduction in lead times and reduced cost as a result of better Management Information.
- Increase pick rate by 20%.
- 90% in 6 days (lead time for break bulk).

	Actual	Desired	Opportunity
Effectiveness rating:	70,7%	91,7%	21,0%

Successes	Obstacles
1. We now have real time information on productivity and utilisation for the whole process and can be pro-active.	1. User resistance due to problems during implementation - took too long to resolve user/ environment/system problems. Users now back on track.
2. Achieved Picking accuracy as measured against internal checks at pick face.	2. Should respond faster to problems after implementation.
3. Pick to Light over achieved production objectives.	3. Through-put capacity, lead times and cost not yet achieved, now in focus. Also not utilising information on labour well enough.
4. Staff are now on our side and the right person is in the right job resulting in a more motivated work force.	4. Exception report reflects long outstanding items as we are not entirely doing FIFO, too difficult.
5. Literacy and numeracy testing followed by thoroughly comprehensive training.	5. Stock control account financial reporting, poor consolidation. Financial areas were changed that were not initially envisaged, resulting in lots of pressure.
6. High level of user involvement.	6. MOD - Oracle, lack of communication, not enough interfaces.
7. Flexible processes for users, resulting in continuous improvement.	7. Reporting and updating of reports.
8. Subdivision and allocation of work during system implementation.	8. MOD bug status 77 to 80 resulted in information being skewed - cannot measure 90% in days goal.
9. Good communication between TAG cross functional teams.	9. Server machine under specified and printers broke down.
10. Good expertise sharing.	10. Ad-Hoc paper pick showed no improvement in production objectives.

DISTRIBUTION SYSTEM PHASE 1

RECOMMENDATIONS	ACTION
1. & 2. Maintain Systems TAG activities throughout implementation phase.	K M D M
3. Focus on information available for enhanced through-put, lead times, costs and labour utilisation.	DDC
4. Operator scheduling orders to schedule according to FIFO where possible. User discipline to be addressed to sort out FIFO according to the order status reports.	R G
5. Finalise financial aspects according to prioritised schedule.	J B K M
8. MOD bug programmed this week 7/4 on live - safety validation.	J B
9. Increase Group skills on calculating and specifying of file server capacities.	K M B S

NOTES
Johannesburg must look at paper pick problem to achieve better process.
Discipline must be 100% on paper pick.
Volume testing for paper pick for Johannesburg is very important.
Parallel run possibility or a different implementation management approach.
Avoid all problems encountered in Durban
Johannesburg should consider quiet time to implement but need volume for testing.
Johannesburg put in financial procedures before DCS.
Johannesburg must ensure that they have the means and resources to respond to problems.
Improvement will be gained through better management information.

DISTRIBUTION SYSTEM PHASE 1

PRIMARY OBJECTIVE

To implement a system that will enable UPC to meet specified core goals by re-engineering the picking and packing processes to deliver improved throughput, increased accuracy, reduced lead times and costs, and paperless processing.

SUPPORTING OBJECTIVE 2

To achieve key output milestones for

- Systems specifications, development, testing and documentation.
- Training on systems of administration, operators and management and documentation of procedures.
- Equipment and Environment acquisition, systems software, installation, commissioning, hardware training and consumables.
- Operationalise staffing and re-deployment, new processes training, supplier training, document work processes, share core knowledge, forewarn staff.
- Project management evaluation and ongoing milestone management
- Implementation system, equipment, pipeline preparation, change-over, parameters, disaster recovery testing, cut-off, pilot and going live.

	Actual	Desired	Opportunity
Effectiveness rating:	68,6%	87,9%	19,3%

Successes	Obstacles
1. Guidance from project leaders.	1. Financial changes were not envisaged. Team was naive and specifications had to change on a Systems TAG decision.
2. Informal QA process during various stages.	2. Financial integrity had to be compromised.
3. Twice a week walk through of specifications.	3. Financial reports were not ready or not specified.
4. Production and publishing on e-mail of design and change documentation on the MOD system.	4. Financial people were invited to TAG session but did not attend.
5. JAD sessions were time well spent.	5. Not enough financial training on all processes.
6. Detailed operational acceptance of specifications.	6. Insufficient acceptance of specifications by Financial users and Internal Audit.
7. Good delivery achieved on changes done to package overseas on face to face discussions.	7. Not enough technical information on certain parts of the system.
8. Development done very well by GIS.	8. The team was too reliant on GIS skills.
9. Staff involvement in progress meetings.	9. Could not work face to face with mainframe developers.
10. Initial resistance was overcome and staffing and re-deployment worked exceptionally well.	10. Late delivery of specifications to GIS exacerbated by tight deadlines and lack of GIS resources
11. Staff re-deployment was world class and no hitches occurred.	11. Communication problems with USA.
12. Team lived up to what they were saying.	12. Did not detail information at sufficient level to avoid misunderstanding.
13. Systems TAG delivered good communication. monitoring and development.	13. Insufficient user involvement in testing.
14. Lots of staff pre-warning 6 months in advance.	14. Users did not keep meticulous record of problems. TAG should be used to resolve problems before, during and after implementation

DISTRIBUTION SYSTEM PHASE 1

15. Information sharing.	15. Users unhappy at end as team communication deteriorated after implementation.
16. Cross functional communication between TAGS worked well to cover overlap of functions.	16. Quick changes not communicated to users caused confusion.
17. "People" objective was a key success of the Operationalise TAG.	17. Systems and user manuals have not been completed.
18. BOP process used in the Operationalise TAG.	18. More use should be made of Dataflow and less writing in setting up manuals.
19. Management and line management involvement in Operationalise processes.	19. Disagreement as to who was responsible for producing different documentation.
20. Structure of TAG teams with formalised meetings and cross functional communication and the Steering (oversight) committee.	20. Checker / QA function did not really happen effectively and could have been more formalised.
21. Responsibilities were well defined.	21. Changes to mainframe programmes while testing.
22. Nursery training on the real equipment.	22. Mainframe test and production environments differ.
23. User assessments during training.	23. Changes to MOD were not well documented and not tested.
24. Feedback on user skills to assess understanding and deployment ability.	24. Changes in the production area were done on the run and not always inspected.
25. Using line managers and supervisors for training.	25. Enhancements were performed during implementation that distracted from priority tasks and were not tested
26. Knew who was to be trained for which processes.	26. Testing phased down too soon and the team should be more realistic about future implementation dates
27. Enough trainers to do 1:1 training if required.	27. Not all things were volume tested.
28. Sourcing of required equipment.	28. Over optimistic on timing of integrated testing.
29. Equipment configuring and installation.	29. System testing not done on schedule.
30. In-house knowledge of equipment which we can operate and maintain.	30. Systems TAG disappeared during testing and should have been kept active longer.
31. Caretakers deployed while key people were overseas.	31. Managers could have been trained more.
32. Chain sign-off acceptance after integration testing and at end of pilot.	32. Timing of training, lack of knowledge at that stage, time allowed to train was too short.
33. Clean cut-off by clearing out DC.	33. Loss control did not get detail training.
34. Divert procedures worked well.	34. Live implementation without parts of the system - accepted the risk.
35. Supplier training completed well in advance.	35. Insufficient server capacity due to reliance on external skills.
36. Nautilus test environment and switch over to live.	36. Do not know why MRWD and Freeze problem occurs.
37. Staged implementation on the mainframe.	37. Not enough clarity on maintenance agreements with equipment suppliers.
38. Some user documents are available, flow documents are available and 70% has been done on ZIZO.	38. Download interface InterConnect caused problems.
39. Training manual used as a user manual.	39. Competition on mainframe initiators may cause problems when DCS1 goes into Johannesburg DC.

DISTRIBUTION SYSTEM PHASE 1

40. Disaster recovery plan prepared and currently with B Sully.	40. Pickface labels incorrectly specified causing smudging.
41. Year 2000 considered and action plan in place to ensure system will be compliant.	41. Scanner problems resolved with interim solution.
42. Face to face Nautilus testing.	42. Business Resumption Plan thought through but not yet documented
NOTE: Considering the project size and number of changes it went exceptionally well.	*NOTE: Leading edge risk - we got off quite lightly.*

RECOMMENDATIONS	ACTION
1. - 4. Financial reporting aspects need to be completed according to a prioritised schedule agreed with the project leader.	M B K M J B
5. Training on MOD DIF enquiry and Nautilus for Financial.	JJ J
6. Internal Audit to be involved in specification sign-off and project team meetings.	K M
7. Address stock control Financial knowledge with Technical Services.	K M
8. Plan to enhance UNIX skill levels to reduce dependencies.	K M
9. & 10. Raise GIS resource problems with CMC as we are compromising systems development. Mainframe resources should be available for face to face development and testing.	M B K M
12. - 16. More formal user involvement is required in testing.	All
17. In process of doing systems documen- ion. Administration and Accuracy user manuals to be completed.	K M
18. - 19. Put user manual into ZIZO system and let manuals evolve over project duration, in agreement with users, based on flowcharts with detailed descriptions.	K M
22. Mainframe Development and Test databases should be identical.	K M J B
26. - 31. All programmes and changes must be tested and inspected.	K M J B
27. & 28. Integrated and Volume testing must be done as early as possible in project. Team testing between GIS and rest of project team.	K M
33. Loss control training to be done.	JJ J
35. Increase Group skills on calculating and specifying of file server capacities.	K M B S
36. Information on the freeze / menu problem to be channelled to K Moodley. Recapture when MRWD / Freeze problem occurs. Cause unknown at this stage.	S A
37. Finalise agreements with suppliers on maintenance in conjunction with users.	K M
38. Monitor download from mainframe.	K M J B
39. Investigate separate mainframe initiators. Investigate possible file contention between Durban and Johannesburg.	K M J B
40. Further investigate smudging of labels.	S A
41. Fine tune throughput for higher scan hit rate. Investigate slowing down something or increasing scan rate - latest scanners on market have not been proven anywhere.	S A K M
42. Document and test Business Resumption Plan and get Internal Audit sign-off.	K M M B

DISTRIBUTION SYSTEM PHASE 1

PRIMARY OBJECTIVE

To implement a system that will enable UPC to meet specified core goals by re-engineering the picking and packing processes to deliver improved throughput, increased accuracy, reduced lead times and costs, and paperless processing.

SUPPORTING OBJECTIVE 3

Achieve benefits to UPC customers:
- Get rid of Store Unpack and Check
- Improved Chain Stock information integrity
- Improved customer service at stores
- Reduced pipeline stock
- Reduce lead time service level agreement by one day from 7 days to 6 days.

	Actual	Desired	Opportunity
Effectiveness rating:	51,4%	83,6%	29,5%

Successes	Obstacles
1. Accuracy SKU before 98,6% now 99,3% Financial before 99,6% now 99,8% consistently achieved.	1. Measurement used to achieve accuracy is different for Chains and UPC.
2. The pick rate/man/day was 3400 now 5500 - 5800. Winter/summer may be different. Not satisfied yet, working to 6500-7000.	2. Store UP+C cannot be UPC responsibility because DC has no control over manual UP+C in stores.
3. Lead times report of orders on status 60-80 now at 5,1.	3. Dump chute IST not looked at yet.
4. Original benefits were determined to be out of control of DCS - found new benefits	4. Temps reduction not stabilised yet.
	5. Unable to measure lead times because of freeze problem and MOD status 77 - 80
	6. Chains keep on changing criteria of benefits needed.
	7. Bill of Lading upload is affecting success of project.

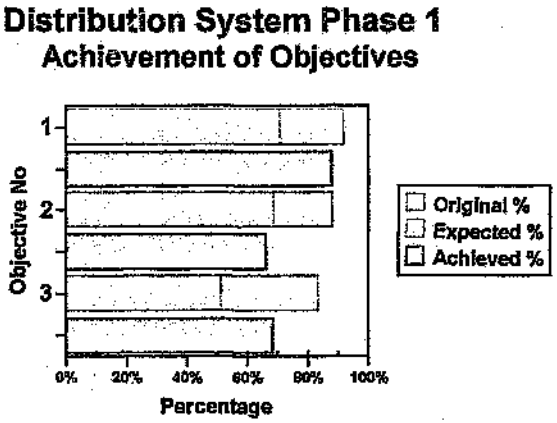
RECOMMENDATIONS	ACTION
1. GLF must come up with criteria on which UPC can be measured.	K M
3. Dump chute IST to be attended to.	C D
5. MOD bug programmed this week 7/4 on live. Information on the freeze / menu problem to be channelled to K Moodley.	K M J B
7. Bill of Lading upload needs investigation	K M J B

FOLLOW-UP: DISTRIBUTION SYSTEM PHASE I

This document reviews the status of the items listed on the CSA action plan generated during the Post Implementation review of the Distribution System phase I. Phase I of the project has had some time to settle down and for initial teething problems to be resolved. It has also recently been complemented by the implementation of phase II, as is evident from some of the comments in the attached updated Action Plan.

The extent towards which objectives were being achieved, were again measured for comparison with that determined by the original CSA workshop and are as follows:

Objective	Actual 4/97	Desired 4/97	Actual 7/97	Change
1. To attain pre-defined core goals for 1) Improved picking and packing, 2) Financial and SKU accuracy, 3) Improved management information, 4) Higher throughput capacity, 5) Increased pick rate and 6) 90% in 6 days.	70,7%	91,7%	87,7%	+17,0%
2. To achieve key output milestones for 1) Systems specifications, development, testing and documentation, 2) Training on system and documentation of procedures, 3) Equipment and Environment, 4) Operationalise, 5) Project and milestone management, and 6) Implementation.	68,6%	87,9%	66,3%	-2,3%
3. Achieve benefits to UPC customers 1) Get rid of Unpack and Check, 2) Improved Chain Stock information integrity, 3) Improved customer service at stores, 4) Reduced pipeline stock, 5) Reduce lead time service level agreement to 6 days.	51,4%	83,6%	68,3%	16,9%



FOLLOW-UP: DISTRIBUTION SYSTEM PHASE I

ACTION STEPS	ACTION	RESIDUAL STEPS	ACTION
1. Bill of Lading upload needs investigation.	K M J B	The upload problem has been fixed. The odd problem still occurs with Bill of Ladings and is being attended to.	K M
2 Financial reporting aspects need to be completed according to a prioritised schedule agreed with the project leader to restore financial integrity.	M B K M J B	Much fewer instances still occur and 3 problems are still being attended to: 1) Double-ups between BOL and PSAP; 2) CAN6 and PSAP reports are sometimes not synchronised, for which an automated recovery system is under construction; and 3) Duplicate GRR's that results in incorrect stock reconciliations. Potential duplicate supplier payments should be prevented by GAP. K Moodley has been appointed to resolve all outstanding problems from DCS phase I as well as any issues resulting from phase II	K M
3. MOD bug programmed this week 7/4 on live with safety validation.	J B	Mod bug has been fixed and no further problems are being experienced.	_
4. Monitor download from mainframe.	K M J B	People in the regions have been trained to monitor the download. The download speed presents some problems when the DC is operating at less than peak volumes, but it has no impact on the peak times. It will be rectified during phase III.	_
5. Focus on information available for enhanced throughput, lead times, costs and labour utilisation.	S A	Adequate information is available, with some manual intervention, to manage individuals and processes. Reports are not yet in the format required, but draft layouts are being reviewed. Final reports will be specified for phase III.	S A K M
6. All programmes and changes must be tested and inspected.	K M J B	All phase I programmes and changes have been checked and inspected.	-
7. Training on MOD DIF enquiry and Nautilus for Financial.	JJ J	Personnel have been trained and are able to use both MOD and Nautilus enquiries.	-
8. Address stock control Financial knowledge with Technical Services.	K M	Ms Magda Jonker has been seconded to take charge of all financial aspects for UPC systems projects.	-

FOLLOW-UP: DISTRIBUTION SYSTEM PHASE I

ACTION STEPS	ACTION	RESIDUAL STEPS	ACTION
9. Information on the freeze / menu problem to be channelled to K Moodley. Recapture when MRWD / Freeze problem occurs. Cause unknown at this stage.	S A	Radio frequency problems have been resolved to a degree but are reoccurring after the implementation of phase II, possibly due to the system workload. Upgrade CPU's have been ordered to cope with the workload until the planned server replacement in October '97. If unresolved this could negatively impact on the Durban DC throughput capacity during the peak period. Other alternatives are also being investigated.	K M
10. Raise GIS resource problems with CMC as we are compromising systems development. Mainframe resources should be available for face to face development and testing.	M B K M	Resource problems have been raised and will again be discussed to obtain new skills. Mainframe resources will be obtained when required.	K M M B
11. Loss control training to be done.	J J	C Driver is in process of transferring his skills to more members of his team.	C D
12. Dump chute IST to be attended to.	C D	Losses are being closely monitored and the Dump Chute is being checked continuously. A stock loss bonus scheme has been implemented to cover the average stock loss achieved until the end of the financial year, with the goal to reduce losses to 0,05%.	-
13. Mainframe Development and Test databases should be identical.	K M J B	The problem has not improved, but is an ideal to strive towards. The mainframe databases will not be required after the implementation of phase III.	-
14. Integrated and Volume testing must be done as early as possible in project. Team testing between GIS and rest of project team.	K M	Earlier volume testing was done and better team integration achieved for Johannesburg phase I. Team integration was not essential during Durban's phase II, but will be crucial for phase III.	K M J B
15. Operator scheduling orders to schedule according to FIFO where possible. User discipline to be addressed to sort out FIFO according to the order status reports.	R G	Scheduling will be addressed by a regional TAG team.	R G
16. Finalise agreements with suppliers on maintenance in conjunction with users.	K M	Agreements have been finalised, pending some changes of suppliers.	K M
17. Increase Group skills on calculating and specifying of file server capacities.	K M B S	Skills have improved and consultants used, but problems still occurred. The project started with 128k servers and is now running 512k servers which are already to small. A quick upgrade path is to be investigated.	K M

FOLLOW-UP: DISTRIBUTION SYSTEM PHASE I

ACTION STEPS	ACTION	RESIDUAL STEPS	ACTION
18. Investigate separate mainframe initiators. Investigate possible file contention between Durban and Johannesburg.	K M J B	Possible file contention problems did not materialise.	-
19. Further investigate smudging of labels.	S A	Experiments that were conducted were inconclusive, but the problem may be weather related and will be monitored.	S A
20. Fine tune throughput f - higher scan hit rate. Investigate slowing down something o: increasing scan rate - latest scanners on market have not been proven anywhere.	S A K M	Scanner has been relocated to slower area in the conveyor system.	-
21. Maintain Systems TAG activities though out implementation phase.	K M D M	Daily meetings were held until conclusion of phase I.	-
22. GLF must come up with criteria on which UPC can be measured.	K M	Final criteria has not yet been decided, but the DC has certain measurements in place.	K M
23. Plan to enhance UNIX skill levels to reduce dependencies.	K M	Staff members have been trained and are expanding their skills through practical experience, but UPC is still heavily dependant on GIS expert Unix skills. Existing skills will be further enhanced.	K M
24. Put user manual into ZIZO system and let manual evolve over project duration, in agreement with users, based on flowcharts with detailed descriptions.	K M	Manuals are being done in Johannesburg and will be 'exported' to Durban.	K M
25. In process of doing systems documentation. Administration and Accuracy user manuals to be completed.	K M	These manuals are evolving and being added to. A custodian is to be appointed and dedicated to finalising and keeping manuals up to date.	K M
26. Document and test Business Resumption Plan and get Internal Audit sign-off.	K M M B	Systems Disaster Recovery Plan has been tested. The DC has managed to keep operating through 'small' disasters. A Business Resumption Plan will be documented and tested.	JJ J
27. Internal Audit to be involved in specification sign-off and project team meetings.	K M	Internal audit has attended some meetings but documentation needs to be addressed.	K M M M P T

FINANCIAL SYSTEM

PROJECT MANAGER OVERVIEW
HIGH LEVEL GAP ANALYSIS

The High Level Gap Analysis has been successfully undertaken by the Project Team with major input from Financial Directors, Financial management and staff.

The team has settled down remarkably quickly and further role clarification of staff is being addressed.

The excellent contributions from the consultant in a facilitating role and that of the supplier's Project Manager and her consultants must be noted.

Project Manager
3 June 1997

FINANCIAL SYSTEM

MAIN OBJECTIVE

TO EXAMINE THE PROGRESS OF THE FINANCIALS PROJECT AS AT THE END OF THE HIGH LEVEL GAP ANALYSIS PHASE

SECONDARY OBJECTIVES

TO DEFINE A HIGH LEVEL GAP ANALYSIS

* *Map ideal process to the new system*
* *Identify Gaps between current business and new system*
* *Identify function, procedure and technology gaps*
* *Recommend an action plan.*

	Actual	Desired	Opportunity
Effectiveness rating:	76%	86%	10%

Successes	Obstacles
Users are open to new ideas to change the way we did business in the past.	1. Change in traditional business analyst, IS and accounting role
Good user participation in all meetings and the involvement of both users and business analysts.	2. Lack of change management. Change manager required for the team to handle the change we are going through (not only the people who are using Oracle).
Project plans in place.	3. No project secretary.
Project is on track.	4. No technical project manager to manage communications between projects.
Disciplined, documented approach to High Level Gap Analysis.	5. Deliverables not agreed with applications staff due to the lack of a technical project manager.
The project team settled in quicker than anticipated and stayed focused.	6. Technical training plan not defined.
The team address and overcome obstacles as they happen.	7. Under utilisation of particularly IS staff.
Combined business and technical staff in the same location.	8. Parked issues could become obstacles.
Good executive sponsorship and enthusiastic Financial Director support.	9. Lack of package integration affects the work plan.
Knowledgeable business analysts, Oracle resources and IS staff.	10. Possibility that project manager could become involved in project owner issues.
The team has a good facilitator available.	11. Training on all modules not completed up front or timeously.
Adequate and sufficient equipment has been provided for team.	12. More specific comparison required with the operating vision.
Good project administration.	13. Additional telephone installation required.
A pilot system is available to test transactions on.	14. Inadequate heating.

FINANCIAL SYSTEM ACTION PLAN

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
HIGH LEVEL GAP ANALYSIS				
1. Change of Project Team roles from traditional to be followed up with D C.	N G			
2. Need to obtain Group decision re Change Management from S A.	N G			
3. Appoint temporary Project secretary until a permanent position is approved.	N G			
4. Appoint Technical Project Manager ASAP. 4a. Technical Manager to set up communications with other projects.	P C Tech Manager			
5. Technical team to put qualifying statement on revised work plan.	K G			
6. Detailed training curriculum to be designed for GIS.	A O			
7. Clearly defined roles at commencement of Operational Analysis and subsequent phases.	N G K G D H			
8. Place parked issues into . Financial Issues database and follow-up by 6 June.	Team			
9. Time scale to be determined for development of Retek integration.	N G D H P C S A			
10. Clear distinction necessary between Project Manager and Project Owner responsibilities	N G S A			
11. All application training will be completed before Operational Analysis phase.	N G D H			
12. Review steps to fulfil Operating Vision.	N G S A			
13.&14. Heating and telephone installation to be followed up.	K G			

FINANCIAL SYSTEM

PROJECT MANAGER OVERVIEW
OPERATIONAL ANALYSIS

The Operational Analysis phase of the project resulting in the identification and documentation of required business processes, detailed GAP analysis and recommendations, interfaces, data conversions and report requirements and staff responsibilities in respect of General Ledger, Accounts Payable, Fixed Assets and Budgeting has been successfully completed on schedule.

The success is particularly attributed to a structured approach, dedicated and focussed individual project teams and good cross communication between teams

Project Manager
23 July 1997

FINANCIAL SYSTEM

MAIN OBJECTIVE

TO EXAMINE THE PROGRESS OF THE FINANCIALS PROJECT AS AT THE END OF THE

* *OPERATIONAL ANALYSIS PHASE*

SECONDARY OBJECTIVES

TO IDENTIFY, DEFINE AND DOCUMENT

* *Business processes,*
* *A detailed GAP Analysis, with recommended Solutions*
* *System Interface Requirements,*
* *Data Conversion Requirements,*
* *Report Requirements,*
* *New procedures Requirements,*
* *Flex-field Requirements.*
* *Set-up Parameter Requirements, and*
* *Application Access / Responsibility.*

	Actual	Desired	Opportunity
Effectiveness rating:	80%	94%	14%

Successes	Obstacles
1. Completed on time.	1. Information requested from other projects not received in full.
2. Achieved on time all documents completed.	2. New change management for phase.
3. Good business co-operation	3. Full co-operation with certain business areas not always obtained .
4. Quality Control used.	4. Future decisions awaited Excel, VOC, Cost Centre development on Unix, A/P Centralisation, etc.
5. Detailed plan was available.	5. Software within is not standardised MS-Office/Excel/Lotus Vision/AIM/ Emulation software.
6. Clear methodology.	6. Communication problems with remote areas.
7. Met our objectives to define operations analysis for budgeting.	7. Lotus Notes access.
8. Team members know each other better.	
9. Successful "team effort".	
10. High level of acceptance by Steering Committee of the team recommendations.	
11. Process modelling.	

Recommendations	Action
1 Communication of Inter project requirements through formal channels	RM
2 a) Appointment of an Oracle change Manager	N. G
b) Interact with Enterprise Wide change management	Appointee
3. Appropriate meeting venue for remote users to ensure co-operation	N. G and Appro team members
4. Awaiting decisions on	
a) Excel, VOC, cost centre development on Unix b) Accounts payable centralisation c) Subsidiary - usage and acceptance d) Subsidiary acceptance of high level Gap analysis	R FSSC MP PS
5.Standarsation Group Desk top Software	DS / KG
6. E-mail communication with subsidiaries needs to be installed	RC / KG
7. Lotus notes access problems to be resolved	K. G

FINANCIAL SYSTEM ACTION PLAN

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
OPERATIONAL ANALYSIS PHASE				
1. Communication of Inter project requirements through formal channels.	R M	No formal feedback yet on other projects, team tend to follow-up ourselves and to review the EW Issues database.	To be raised at Steering Committee	N G R M
2a) Appointment of a Change Manager.	N G	Has been appointed.		
2b) Interact with Enterprise Wide Change Management.	Appointee	Ongoing interaction established.		
3. Appropriate meeting venue for remote users to ensure co-operation.	N G and appropriate team members	Number of people and seniority determines meeting venues.		
4. Awaiting decisions on: a) Excel, cost centre development on Unix. b) Accounts payable centralisation. c) Subsidiary - usage and acceptance. d) Acceptance of High level gap analysis.	 R M FSSC M P P S	 a) Decisions taken. b) Finalised c) Usage has been finalised. d) Finalised	a) Timing of the Cost Centre development to be decided.	R M
5. Standardisation Group Desk top software.	D S K G		Open Systems standards for the Group needed from A Escalate to Steering Committee if necessary.	K G N G
6. E-mail communication with subsidiaries needs to be installed.	R C		Still outstanding.	K G
7. Lotus notes access problems to be resolved.	K G	Most team members have Notes access.	2 Users to be added via Help desk.	K G

FINANCIAL SYSTEM ACTION PLAN

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
HIGH LEVEL GAP ANALYSIS				
1. Change of Project Team roles from traditional to be followed up with D C.	N G	Have had discussions with D C but have identified areas of responsibility independently based on deliverables.		
2. Need to obtain Group decision re Change Management from S A.	N G	Enterprise wide change management document now available to the Project Team. Change manager appointed for the project.		
3. Appoint temporary Project secretary until a permanent position is approved.	N G	The position has been advertised. Secretary has been appointed.		
4. Appoint Technical Project Manager ASAP. 4a. Technical Manager to set up communications with other projects.	P C Tech Manager	K G has taken this role. Decided there is sufficient resources within the team to utilise for this purpose.		
5. Technical team to put qualifying statement on revised work plan.	K G	Revised work plan has been completed and it does not include specific time scales on development.		
6. Detailed training curriculum to be designed for GIS.	A O		This matter is still unresolved and training is outstanding.	B N
7. Clearly defined roles at commencement of Operational Analysis and subsequent phases.	N G K G D H	Clearly defined roles have been established so this problem is resolved.		
8. Place parked issues into a Financial Issues database and follow-up by 6 June.	Team	Database has been set up.	Issues will be continuously monitored and kept on Project Team meeting minutes until resolved.	Team
9. Time scale to be determined for development of Retek integration.	N G D H P C S A	Retek interfaces meetings have commenced.	Continue to meet on interfaces as needed.	N G AP and GL teams
10. Clear distinction necessary between Project Manager and Project Owner responsibilities.	N G S A	Have decided on a compromise situation as there is no full time Project Owner.		
11. All application training will be completed before Operational Analysis phase.	N G D H	Training has been included in workplans for next module.		
12. Review steps to fulfil Operating Vision.	N G S A	This has been prepared.	Needs to be finalised pending feedback from the Steering Committee.	N G S A
13.&14. Heating and telephone installation to be followed up.	K G	Resolved.		

FINANCIAL SYSTEM

PROJECT MANAGER OVERVIEW

The Solutions Design phase of the project for the General Ledger (GL), Accounts Payable (AP) and Fixed Assets (FA) has been successfully completed. A number of obstacles particularly relating to technical issues hampered the phase, but the resilience of the team members coupled with the structured approach for the production of deliverables and effective quality assurance, achieved the desired results.

Both Solutions Design and Build of the Budgeting section of Financial Analyzer were scheduled for completion. The Solutions Design has been undertaken. However the current methodology is not suited to the degree of detail required for Financial Analyzer, which has hampered the build phase. Notwithstanding the above, detailed attention to the problem is in progress and the implementation will not be adversely effected.

PROJECT MANAGER
3 October 1997

FINANCIAL SYSTEM

MAIN OBJECTIVE

To conduct a solutions design for General Ledger, Fixed Assets, Accounts Payable

* Application setup,
* Reports,
* Interfaces,
* Data Conversion,
* User Procedures,
* Test Scripts, and
* Technical Procedures.

To conduct a solutions design and build for Financial Analyzer.

	Actual	Desired	Opportunity
Effectiveness rating:	71%	89%	18%

Successes
Quality Assurance process ensures completeness of documentation.
Clear route map.
Standard design documentation deliverables for GL AP & FA.
Majority finished on time.
Consultants knowledge.
Technical resource appointed.
Solutions found for gaps from Operational Analysis.
Team resilience.
Training on Reports 2.
Morale uplifted with transfer of skills from UK based technical expert.
Cleanup of data on current Fixed Assets system.
Technical resource for Financial Analyzer.
Excellent 4 day training course on FA.
Good cooperation with users.
Successful visit to UK to gain knowledge on Version 10.7
Overcame the majority of obstacles through workarounds and good teamwork.
Technical skills have been gained and updated since Operational Analysis phase.

FINANCIAL SYSTEM

Obstacles	Recommendations	Action
1. Microsoft Office virus, bugs, support and standards need to be resolved..	1. MS Office needs to be accepted as standard for the project and support structures provided.	K G
2. Lack of in-house technical skills.	2. Acquire in-house skills on new environment. Acquisition of resources by D S.	K G
3. Current 'Dr Solomon's anti-virus software does not detect or fix MS Word virus.	3. D S to keep Dr Solomon's up to date so individual users / projects do not have to update it themselves.	K G
4. Need to convert documents from Word to AmiPro for e-mail to other users.	4. Standard viewer problem to be logged with EW Programme Office to address Group perspective.	N G K G
5. Smart client problems, while awaiting newer version.	5. Monitor installation.	K G D H
6. Major effort required to get access to technical development environment.	6. Meet with D S to discuss setup of the Development Environment.	K G
7. Little technical feedback from other projects.	7. & 16. Raise at Steering Committee that feedback is needed from EW Programme Office to all project managers.	N G
8. Solutions Design document too high level for Financial Analyzer.	8. & 15. Detail planning session to be held on Financial Analyzer with deliverables.	M W
9. Lack of timeous knowledge on Financial Analyzer.	9. Attempt to get skills transfer from Oracle consultant on a more regular basis for Financial Analyzer.	M W D H
10. GL integration to be clarified.	10. Action plan is in place.	K G
11. Major delay in EW Change Management process with regard to communication to users.	11. Formulate action plan with R M as matter of urgency.	N G
12. Not all technical issues communicated to team.	12. Information to be shared in project team meetings.	Team
13. Lack of prompt decision making by business / project owner.	13. Timeous decision making and any delays to be escalated to EW Steering Committee. Project owner to be invited to attend selected project meetings.	N G
14. Meetings held in offices disturb fellow workers.	14. Explore possibility of utilising laptop computers for meetings, and show consideration for fellow workers.	Team
15. Build late on Financial Analyzer will impact Analyzer deadlines but not the rest of the project.	See 8 above.	-
16. Prevented from communicating with users Group wide.	See 7 above.	-
17. Linking between AP to GL and AP to FA systems.	17. Install and test Version 16.1	K G D H
18. Lack of knowledge about Multi-Org in Oracle Version 10.7.	18. Resolved, now have knowledge.	-
19. Change in Change Management function due to having to rebuild relationships.	19. Resource will overcome learning curve and get up to speed.	-

FINANCIAL SYSTEM ACTION PLAN

SOLUTIONS DESIGN - OCTOBER 1997

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
1. MS Office needs to be accepted as standard for the project and support structures provided.	K G			
2. Acquire in-house skills on new environment. Acquisition of resources by D S.	K G			
3. D S to keep Dr Solomon's up to date so individual users / projects do not have to update it themselves.	K G			
4. Standard viewer problem to be logged with EW Programme Office to address Group perspective.	N G K G			
5. Monitor installation.	K G D H			
6. Meet with D S to discuss setup of the Development Environment.	K G			
7. & 16. Raise at Steering Committee that feedback is needed from EW Programme Office to all project managers.	N G			
8. & 15. Detail planning session to be held on Financial Analyzer with deliverables.	M W			
9. Attempt to get skills transfer from consultant on a more regular basis for Financial Analyzer.	M W D H			
10. Action plan is in place.	K G			
11. Formulate action plan with R M as matter of urgency.	N G			
12. Information to be shared in project team meetings.	Team			

FINANCIAL SYSTEM ACTION PLAN

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
13. Timeous decision making and any delays to be escalated to EW Steering Committee. Project owner to be invited to attend selected project meetings.	N G			
14. Explore possibility of utilising laptop computers for meetings, and show consideration for fellow workers.	Team			
17. Install and test Version 16.1	K G D H			

FINANCIAL SYSTEM ACTION PLAN

OPERATIONAL ANALYSIS - JULY 1997

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
1. Communication of Inter project requirements through formal channels.	R M	No formal feedback yet on other projects, team tend to follow-up ourselves and to review the EW Issues database.	To be raised at Steering Committee	N G R M
2a) Appointment of a Change Manager.	N G	Has been appointed.		
2b) Interact with Enterprise Wide Change Management.	Appointee	Ongoing interaction established.		
3. Appropriate meeting venue for remote users to ensure co-operation.	N G and appropriate team members	Number of people and seniority determines meeting venues.		
4. Awaiting decisions on: a) Excel, cost centre development on Unix. b) Accounts payable centralisation. c) Subsidiary - usage and acceptance. d) Subsidiary acceptance of High level gap analysis.	 R M FSSC M P P S	a) Decisions taken. b) Finalised c) Usage has been finalised. d) Finalised	a) Timing of the Cost Centre development to be decided.	R M
5. Standardisation Group Desk top software.	D S K G		Open Systems standards for the Group needed from A O Escalate to Steering Committee if necessary.	K G N G
6. E-mail communication with subsidiaries needs to be installed.	R C		Still outstanding.	K G
7. Lotus notes access problems to be resolved.	K G	Most team members have Notes access.	2 Users to be added via Help desk.	K G

FINANCIAL SYSTEM ACTION PLAN

HIGH LEVEL GAP ANALYSIS - JUNE 1997

ACTION PLANNED	PERSON	ACTION TAKEN	RESIDUAL STEPS	PERSON
Change of Project Team roles from traditional to be followed up with D C	N G	Have had discussions with D C but have identified areas of responsibility independently based on deliverables.		
2. Need to obtain Group decision re Change Management from S A.	N G	Enterprise wide change management document now available to the Project Team. Change manager appointed for the project.		
3. Appoint temporary Project secretary until a permanent position is approved.	N G	The position has been advertised. Secretary has been appointed.		
4. Appoint Technical Project Manager ASAP. 4a. Technical Manager to set up communications with other projects.	P C Tech Manager	K G has taken this role. Decided there is sufficient resources within the team to utilise for this purpose.		
5. Technical team to put qualifying statement on revised work plan.	K G	Revised work plan has been completed and it does not include specific time scales on development.		
6. Detailed training curriculum to be designed for GIS.	A O		This matter is still unresolved and training is outstanding.	B N
7. Clearly defined roles at commencement of Operational Analysis and subsequent phases.	N G K G D H	Clearly defined roles have been established so this problem is resolved.		
8. Place parked issues into a Financial Issues database and follow-up by 6 June.	Team	Database has been set up.	Issues will be continuously monitored and kept on Project Team meeting minutes until resolved.	Team
9. Time scale to be determined for development of Retek integration.	N G D H P C S A	Retek interfaces meetings have commenced.	Continue to meet on interfaces as needed.	N G AP and GL teams
10. Clear distinction necessary between Project Manager and Project Owner responsibilities.	N G S A	Have decided on a compromise situation as there is no full time Project Owner.		
11. All application training will be completed before Operational Analysis phase.	N G D H	Training has been included in workplans for next module.		
12. Review steps to fulfil Operating Vision.	N G S A	This has been prepared.	Needs to be finalised pending feedback from the Steering Committee.	N G S A
13.&14. Heating and telephone installation to be followed up.	K G	Resolved.		

Retailer Quality Assurance & Self Assessment System : _____

1. INITIAL MEETING

FOR COMPLETION BY:

Facilitator, Systems Manager, Business Analysts, User Department Representatives, and Executive Champion.

OBJECTIVES

Development Process Objective: To state, define and record a business problem and vision of a solution that will include or be driven by an application information system.

Quality Assurance Objective: To ensure that group development standards have been applied, documentation prepared and the vision adequately defined and documented.

Business Objective: To ensure that the vision have been discussed in sufficient detail so that it is clearly understood. To ensure that the vision is a viable alternative that will present the optimal business solution for the business problem.

Self Assessment Objective: To ensure that the above objectives are achieved within an adequate control framework, which will limit business risk exposures to acceptable levels.

PREREQUISITES

Confirm that the following development phase has been completed and the deliverables completed:

Development Phase	Deliverables	Yes / No / NA	Initials	Date
1 Initial Meeting	Business Need with critical success factors (CSF); Broad Solution and objectives; Mandate for team reference; Gross benefit analysis with expected tangible and intangible benefits· Initial project team composition; Project assignment brief.			

Motivate any deviations from the above prerequisites:

Retailer Quality Assurance & Self Assessment System : _____

1. INITIAL ME TING

QUESTIONNAIRE

Measurement	Yes / No / NA	Initials	Date
1 Was the Initial Meeting attended by representatives from all relevant users departments, divisions or chains, bearing in mind the overall vision of the project?			
2 Have the business requirements been clearly defined and documented?			
3 Has the executive champion been satisfied that his vision was adequately understood, discussed and documented?			
4 Were basic business rules for the affected business area defined in the vision and documented?			
5 Have the critical success factors and the project objectives been defined and recorded?			
6 Was an overview of present business processes presented to the meeting?			
7 Was a schedule of events discussed and individual responsibilities allocated as basis for a project plan?			
8 Were strengths and weaknesses of the existing system and interface systems discussed in global terms and recorded in the project documentation?			
9 Do you have any reservations or concerns about the project or the progress achieved to date? If yes, discuss below.			

COMMENTS

(Attach separate message if necessary)

1. INITIAL MEETING

DECLARATION

	Initials	Date
I am satisfied that the development standards were adhered to and that satisfactory explanations were documented for any deviations. "POST INITIAL MEETING" questionnaires were completed by all the required team members and adequate controls were maintained during this project phase.		

-o0o-

2. PROJECT SCOPING

FOR COMPLETION BY:

Business Analysts, Systems Analysts, Facilities Representative, Capacity Planning Representative, Data Architecture Representative, User Department Representatives and Systems (Project) Manager.

OBJECTIVES

Development Process Objective: To ensure that we have a clear definition of the business problem, user vision, project scope and envisaged IT solution, so that accurate data and process requirements can be defined during the JADD process.

Quality Assurance Objective: To ensure that group development standards have been applied, documentation prepared and user needs adequately defined, translated and documented as technical data and process requirements.

Business Objective: To ensure the project scope has been defined and that sufficient and accurate information has been assembled and compiled for presentation to the JADD players.

Self Assessment Objective: To ensure that the above objectives are achieved within an adequate control framework, which will limit business risk exposures to acceptable levels.

PREREQUISITES

Confirm that the following development phases have been completed before the project proceeds to JADD:

Development Phase	Deliverables	Yes / No / NA	Initials	Date
1 Initial Meeting	Initial Meeting questionnaires.			
2 Steering Committee	Steering Committee approval, prioritising and scheduling.			
3 Joint Requirements Planning	Project scope with exclusions and inclusions; Assumptions; Macro context diagram; Gross benefit analysis in monetary and/or man-hour terms; Macro business rules; SLA's; Initiation of change management process.			
4 Initial Technology Review	Technical Review; Processing environment report; Initial environment decisions.			
5 Business Review of JRP	Decision to accept the scope and initial environment decisions and proceed to JADD.			
6 JADD Preparation	Data and process models; Existing / initial data models; Existing / initial process models.			

2. PROJECT SCOPING

QUESTIONNAIRE

Measurement	Yes / No / NA	Initials	Date
1 Has the Steering Committee issued a directive on the project's priority and when it is to continue?			
2 Were project boundaries, any specific inclusions, exclusions and assumptions clearly defined and recorded?			
3 Are you satisfied that the project as defined will meet the System Objectives and user requirements?			
4 Have the executive champion and user representatives agreed to the identified project boundaries and confirmed that the vision is still complied with?			
5 Are the expected monetary and other benefits realistically reflected in the project documentation?			
6 Describe the technique by which these benefits will be measured?			
7 Have all interface systems been identified and their systems managers notified?			
8 Were present business processes discussed and analysed for potential re-engineering?			
9 Will any BPR exercise be conducted as part of this project?			
10 Was agreement reached on the validity of business rules for the affected business area, given the re-engineering possibility of the project?			
11 Have the strengths and weaknesses of the existing systems been reviewed to ensure they have been adequately considered in the project?			
12 What other alternative solutions to the business problem have been considered? What are the advantages and disadvantages of these alternatives?			

2. PROJECT SCOPING

Measurement	Yes / No / NA	Initials	Date
13 Has a budget been formulated and documented in terms of manpower (including users) and funds required for the project?			
14 Will economies of scale be realised through applying the same system on a shrink-wrap basis through similar chains or business units?			
15 If the system is to be modified for individual business unit requirements, discuss those requirements?			
16 Were business risks analysed and documented in terms of completeness, accuracy, timeliness, authorisation and security of information?			
17 Were application control guidelines determined and documented according to the business risks?			
18 Are you familiar with the contents of the long-term IT strategy and business strategy documents for the area under consideration?			
19 Does the proposed system support the long-term strategy, plans and structures of the business?			
20 Has sufficient time and funds been allocated to the project taking known difficulties and potential problems into consideration?			
21 Were individual responsibilities defined and will those individuals be able to spare the time required not to slow the process?			
22 Will the proposed system rely on any leading edge or unproven technology, or will it require specialist skills not readily available in the Group?			
23 If yes to above, discuss how you will control these high risk factors?			
24 Will the proposed system operate on the standard equipment and operating systems identified in the Group infrastructure standard?			

2. PROJECT SCOPING

Measurement	Yes / No / NA	Initials	Date
25 If no to previous, what unique requirements cannot be catered for by the standard platforms?			
26 Is the system designed in modular format, whereby modules can be individually tested and implemented?			
27 Discuss how the project budget will be controlled and how often it will be reported on?			
28 Do you have any reservations or concerns about the project or the progress achieved to date? If yes, discuss below.			

COMMENTS
(Attach separate message if necessary)

DECLARATION

	Initials	Date
I am satisfied that the development standards were adhered to and that satisfactory explanations were documented for any deviations. "PROJECT SCOPING" questionnaires were completed by all the required team members and adequate controls were maintained during this project phase.		

-o0o-



SIGN-OFF CERTIFICATE

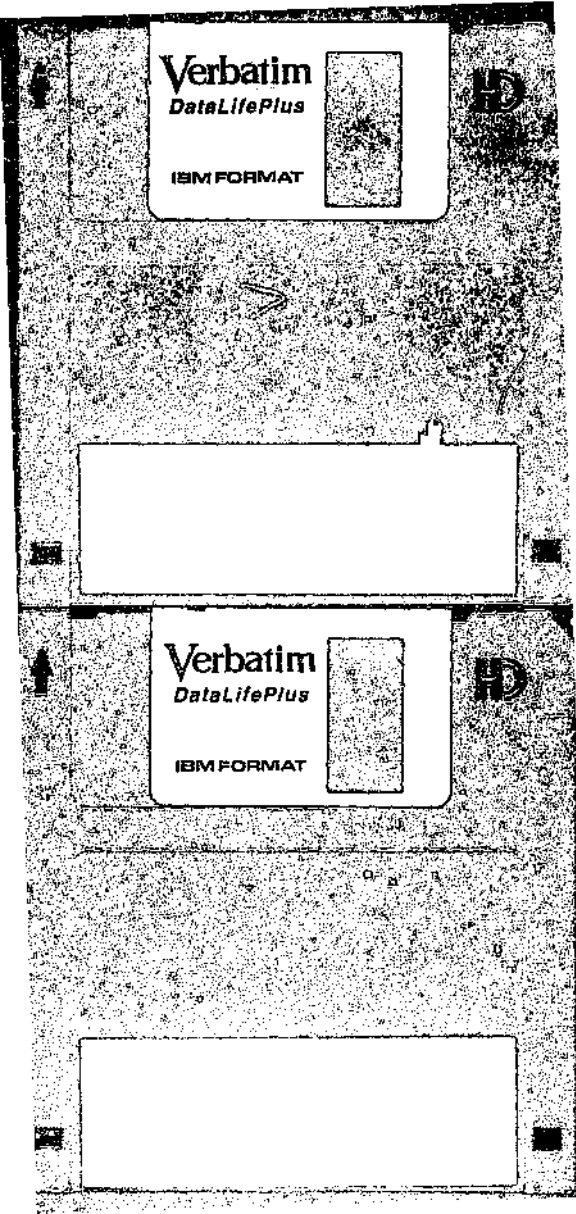
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CERTIFICATION

After implementation of the attached action plan, we hereby certify that, to the best of our knowledge, the system of internal controls is adequate and the project sufficiently documented, to provide reasonable but not absolute assurance that the project phase objective(-s), benefits and critical success factors should be achieved and related risks monitored and managed to acceptable levels.

NAME:	SIGNATURE:
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Name of thesis: Questions on using control self assessment techniques on information systems development projects.

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