INFORMATION SYSTEMS IMPLEMENTATION CHALLENGES IN KENYAN PARASTATALS

BY

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DECLARATION

This project is my original work and has not been submitted in any other universit academic purpose.

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DEDICATION

To Gladys Kegeni, my love, whose continuous encouragement gave me reason to achieve my goal. To my parents, brother, and sisters whose support and encouragement is beyond words.

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ACRONYMS

ERP	Enterprise Resource Planning
ICT	Information and Communication Technology
ISs	Information Systems
IT	Information Technology
JAD	Joint Application Development
LAN	Local Area Network
RAD	Rapid Application Development
SDLC	Software Development Life Cycle
WAN	Wide Area Network

ABSTRACT

Parastatal in Kenya are adopting Information and Communication Technology as a tool to improve transparency, efficiency and effectiveness in service delivery, through implementation of information systems (ISs). Whereas parastatals have adopted several practices in the implementation of ISs, a number of challenges may arise during implementation thus, making them not to realise the envisioned benefits. The main objective of the study was to establish the practice of ISs implementation and to determine the challenges faced by state parastatals in ISs implementation.

This study therefore adopted a survey design methodology because the researcher intended to collect cross sectional data on ISs practice and implementation challenges in Kenyan parastatals. The main instrument for data collection was a structured questionnaire which was administered to IT officers in state parastatal, targeting 50% of the total population through judgmental sampling. The Drop-and-Pick later approach was used to collect the questionnaire. Out of the 65 questionnaires distributed, 53 were filled and returned giving a response rate of 82%. The research questions were systematically generated from the objectives. The data collected was, cleaned, coded and analysed with the aid of SPSS package. Descriptive statistics and factor analysis were used to help in drawing comparisons and conclusions. It was assumed in data analysis that the results obtained were quite a representative for the general population.

The findings of the practice of ISs implementation in Kenyan state parastatals indicate that most state parastatals have adopted several practices in their ISS implementation. Although the approaches adopted have assisted parastatals to implement ISs, there is lack of; detailed ISs implementation work plan, user acceptance, system testing, version control, regular review of system documentation, stress testing and established IT department to spearhead ISs implementations. Further, parastatals lack appropriate policies, IT standards, procedures for handling changes to the ISs. In addition, the findings show that there is lack of detailed risk log and risk management procedures which are fundamental for successful ISs implementation.

The study further, found that the following challenges are faced by Kenyan state parastatals in ISs implementation. These include the challenge of; process and structure, procurement

and communication, information systems design and people management, database design and conversion, skills and information systems security, regulatory and implementation tools, corruption, technical and systems tuning, software and hardware compatibility, expertise in software evaluation and the challenge of cost benefit analysis.

The study findings drew the following conclusion, state parastatal have adopted several practices of ISs development and implementation. Whereas some of the practices are good, some of the practices are the basis of the challenges faced by state parastatals in ISs implementation. As observed in the literature the challenges tend to compare heavily with literature, but fall on process, people and ISs management aspects. These can be addressed by embracing recognized ISs implementation standards, reducing bureaucracies and transparent in ISs procurement. In addition, there is need for the management to hire qualified IT staff to spearhead automation activities.

CHAPTER ONE

INTRODUCTION

1.1. Background

Computer based systems and information technology have had a significant impact on organizations over the past thirty years. They are viewed as means of providing competitive edge and hence, they are becoming part of the organization strategy. Computer based information systems have reduced transaction costs, altered nature of operations in organizations, enabled firms to develop closer relationships with their clients and created new opportunities for organizations. Recent generations of information systems in public sector support electronic delivery of public services to the citizens and business enterprises by enabling them to make most of their transactions with the government through electronic channels such as the Internet (Bellamy & Taylor 1998, Bekkers & Zouridis 1999). New concepts are being developed based on the above advanced capabilities such as the 'New Electronic Customer Focused Government', and the 'Virtual Public Enterprises'.

Despite the proliferation of computer based applications in public sector, the implementation of systems remains a significant issue. A number of ISs in public sector organizations are underutilized and they do not meet their potential or fail to be used at all. Information systems planning, design, development, operation and implementation in public sector organizations are performed in a uniquely challenging context. Parastatals are often burdened with unflexible procurement rules, hiring and rewarding procedures and operate in an unflexible institutional framework. Although they are rarely subjected to the challenges of the market competition they are often confronted with political pressures.

These factors contribute towards a set of unique, demanding and difficult issues regarding information system implementation. There is need for parastatals to implement information systems effectively in order to be able to harness the capabilities of the particular IS inline with the strategy of the organization. Improving ISs implementation continues to rank highly among the major issues facing managers in parastatals in the management of user oriented IT services in many public sector organizations (Doherty et al, 1999).

Interest in the challenges of ISs in state parastatals has grown over the recent years. The approaches used currently to manage ISs have not always produced satisfactory results. Computer based systems take too long to develop, user departments often voice their dissatisfaction with the quality and timeliness of support they receive from IT departments, while implementation of information systems often run over budgets. Systems are in most cases perceived not to deliver the benefits on which they were originally business justified (Gottschalk, 2001).

1.1.1. Information Systems Implementation Process and Challenges

Information systems implementation process involves along range of planning for funds, human resources, services, and technical expertise, hardware and software capabilities needed to exploit ISs opportunities which arise from time to time (Baker, 1995). According to Duhan et al (2001), ISs implementation refers to anticipating and strategically managing the impacts of change of technology component such that information systems become fully operational as the organization comes to a post-implementation state.

Canzer (2003) further defines ISs implementation as a complex process involving mobilizing systems, making adjustments to the existing systems, communication with stakeholders and integration of work. It is a learning process and implementation of flexible structures that are imperative for the attainment of the organizational goals. IS implementation involves a rigorous process of system scoping, user requirement definitions, system design, development, testing and implementation. It's a whole process of strategising on how the ISs component will suit the business needs of the organization and putting the implementation plan into operation. Waterfall, joint application development and rapid application development are some of the various methodologies that have been proposed in system development life cycle.

Despite numerous methodologies having been proposed, Kenyan parastatals still fail to effectively deal with ISs implementation and related challenges. Hackney, R. and Little, S. (1999), observed that, IS implementation in parastatals is significantly influenced by cultural, political and power-behavioural situations within parastatals.

Further studies indicate that the challenges of ISs implementation vary from one organization to another. These include political and socio-economic issues, the top management support and the influence of the group leaders. According to Flynn (1995), project teams require a powerful champion to support the technologically weak organization and to ensure that communication process function as planned. Further, the inadequate resources allocation and the relevance of IT projects to parastatals rank highly on information systems challenges, IS projects are very expensive, the determination of the optimum level of automation and computerization in order for the organization to achieve maximum business value from IS investment is one of the common concerns in state parastatals (Pant et al 2001). Jit (2003) observed that the challenge of appropriate software for automation, human resources aspects, on time and within budget maintenance of ISs facilities are key technical challenges in IS implementation.

1.1.2. Public Sector and State Parastatals in Kenya

Information Systems have become part of state parastatals operations today. Like many businesses, parastatals rely heavily on IT infrastructure to provide services to citizens. Parastatals are part of public sector organizations established and controlled by the government. Parastatals are created by state corporation's acts, to mention a few; the NCPB Act, Cap.338 created the National Cereals and Produce Board, Cap 347 led to the National Irrigation Board, Cap 481 created National Oil Corporation of Kenya under the companies

Today information systems are found in all sections of the public sectors and in all countries. Many parastatals have developed ISs to monitor and control the services they provide. In the USA and UK Social Security agencies developed IS to report on the welfare payments and services they provided (Danziger, 1991; Bellamy & Henderson, 1992,). The British public healthcare invested in ISs to control healthcare costs and to improve service delivery standards (Ballantine & Cunningham, 1999). In Malaysia, government workers had a better understanding of what was going on in their areas due to the introduction of ISs, farmers have access to detailed information on livestock and agricultural product, and this has made them to make better use of available resources (Tottle, 1986). Similarly in the USA, the ISs for statistical analyses gave USA state agencies a better understanding of what was going on in contract bidding (Anthes, 1993). Without ISs, such an understanding would have not been possible. In addition, ISs can improve job satisfaction for civil servants and can reduce the number of paper records that have to be held in the office. ISs are fundamental for parastatals

in order to improve transparency and efficiency in service delivery. Information systems in parastatals comprise of transaction based ISs, public sector administration and regulation information systems and public sector service delivery information systems, just to mention a few.

In Kenya, the government has initiated substantial investments towards installation of ISs infrastructure in state parastatals. Funding for these investments is achieved through partnerships between the government and development partners. The foreign funding component constitutes the largest percentage of this investment in terms of technology. The government contribution is usually in the form of technical, support staff and facilities including buildings. So far, the Government Information Systems Investment and Management Framework are connecting most government agents (parastatals) in the respective ministries to the Internet under the Executive Network (Limo 2003). The government is also connecting the ministries to run integrated information systems for example the Integrated Financial Management Information System (IFMIS) and the Integrated Personnel and Pensions Database (IPPD). While developing countries may have similar characteristics, the Kenyan context presents various challenges that affect the successful implementation of ISs projects (Waema, 2004).

The Kenyan ISs environment is characterised by ISs projects that are initially donor funded with some donations being made without prior consultation or carrying out a needs analysis by the recipient organization. These means that, operational/running costs are met by the government organization while funding (capital and human resource requirements) ends with the project phase. Of major concern is the fact that, the budgets for ISs are inadequate but rising and there is lack of IS implementation policies and master plans to guide implementation of ISs in parastatals, to the extent that, there have been multiple investments for the same product due to lack of coordination. A focus on ISs applications that support traditional administrative rather than on effective information processing is common in many parastatals.

Parastatals like Kenya Revenue Authority, Kenya Ports Authority and Kenya Pipeline just to mention a few are using ISs to provide online services to the public. However many authors report a relative delay in the application of ISs in other parastatals in Kenya. The delay has partially been attributed to ISs implementation challenges. Kashorda, et al (2007) observed that technical issues like slow response time, financial measures, and system quality and user

satisfaction play significant role in the successful implementation of ISs in parastatals. This research will explore the challenges facing state parastatals in IS implementation stage.

1.2. Statement of the Problem

Worldwide attention is directed towards public sector Information Systems projects. In Kenya parastatals heads have signed performance contracts that are cascaded downwards as part of government initiatives to improve service delivery in state corporations. In order to achieve the performance contract initiatives, ISs have been adopted as means for improving operational efficiency, service delivery and satisfaction to citizens. Even though, ISs are meant to enhance service delivery, the introductions of ISs in parastatals have not always produced satisfactory results. Flynn and Arce, 1995 observed that, only 24 per cent of planned ISs applications in public sector were actually developed.

A great deal has been written about the advancements in IT and the proliferation of ISs in state parastatals over the recent years. Waema (1995) evaluated the issues, problems and strategies of Information Systems implementation in developing countries. Waema (2009) studied the implementation of the financial management system in local authorities. Doherty et al (2002) proposed various frameworks for improving the effectiveness of IS implementation. Mentzas (1997) examined strategic ISs planning issues by survey studies; Premkumar and King (1994) evaluated effectiveness of IT planning in ISs implementation; Salmela et al (2000) examined actual ISs planning practices in a turbulent environment. However, much of the research conducted on ISs implementation in the past decade focused on identifying and measuring the organizational characteristics which appear to be particularly conducive to either success or failure of ISs development efforts.

While such research is useful in providing insight about ISs implementation challenges, it provides little guidance for the management of ongoing implementation efforts and they do not address ISs implementation challenges more specifically to state parastatals. ISs implementation is a seamless integration of processes which must be carefully managed. Since system development efforts can be viewed as multi-stage processes, a comprehensive and interactive approach of requirement definition, system design, system development, quality assurance, testing and careful implementation is very crucial.

While most decisions are made during the first stages of problem identification, the definition stage accounts for less than 25% of the resources required for ISs development. The decisions which will have the greatest effect on the users' acceptance or rejection of a system are made during the implementation stage, making implementation stage critical in system development lifecycle (Flynn and Arce, 1995).

Although a number of studies had been done with respect to ISs implementation in public sector, none had been done with respect to parastatals in Kenya. There was need for parastatals heads to know how the practice and the challenges faced by state parastatals in ISs implementation. In view of this the following research questions arose, what were the practices of ISs implementation in state parastatals? What were the challenges faced by Kenyan parastatals in ISs implementation?

1.3. Objectives of study

The specific objectives of the study were;

i.) To establish the practice of information systems implementation by state parastatal in Kenya.

ii.) To determine the challenges faced by Kenyan parastatal in information systems implementation.

1.4. Significance of study

The finding of the study could be valuable to parastatals implementing new ISs in their organizations as it brings out the practise and challenges associated with IS implementation in state parastatals. To the government and donor agencies the study could provide valuable information that could guide them in financing ISs implementation in state parastatals in order ensure that benefits of the systems are realised.

Since ICT sector innovations and inventions depend a lot on survey carried out, this document could be used as a future reference by academicians and student of management science interested in the same areas of study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

There are many stages involved in the successful creation and application of information systems. Successful development of ISs is not guaranteed as failure can occur at various stages of ISs development. Liebowitz (1999) observed that 55% of projects fail during problem scoping and inception; 20% during requirement analysis; 15% during testing, 5% during design; 5% during implementation and none during coding. Once the decision has been made to embark on such a project, a thorough planning at each stage is essential for the success of the overall project. Implementation is the final critical stage, although it constitutes 5% if not properly managed the entire efforts of ISs development may fail and the system will not be delivered.

According to Alexander (1974) a system is "a group of elements either physical or non physical in nature that exhibits a set of interrelations among themselves and interacts together toward one or more goals, objectives, or ends. Bocij (2003) referred a system as a group of interrelated components that work collectively to carry out input, processing, output, storage and control of actions in order to convert data into information products that can be used to support forecasting, planning, control, coordination, decision making and operational activities in an organization.

Senn (1990) suggested that ISs do not need to be computer based; this is because in a manual system where people and procedures perform tasks effectively and efficiently without producing errors, computers may not be needed. However, computers may only be introduced if it is seen that the introduction will improve the current system. In this study the term will be used to refer to ISs which are computer based.

2.2 Information Systems Development

Information systems development involves the entire the process of engineering of ISs to support a business process. The conceptual model of Systems Development Life Cycle (SDLC) is used in project management to describe the stages that are involved in IS project development from an initial feasibility study through maintenance of the completed application.

Information systems development involves various development methodologies. These include; the waterfall model, Rapid Application Development (RAD), Joint Application Development (JAD), the Fountain Model, the Spiral Model, build and fix and the synchronize-and-stabilize. Although there are many models of SDCL, frequently several models are combined into some sort of hybrid methodology, however, some methods work better for specific types of projects (White, 2007).

The initiation of a system (or project) begins when a business need or opportunity is identified. A Project Manager should be appointed to manage the project. This business need is documented in a Concept Proposal. After the Concept Proposal is approved, the System Concept Development Phase begins.

Once a business need is approved, the approaches for accomplishing the concept are reviewed for feasibility and appropriateness. The Systems Boundary Document identifies the scope of the system and requires Senior Official approval and funding before beginning the Planning Phase.

The concept is further developed to describe how the business will operate once the approved system is implemented, and to assess how the system will impact employee and customer privacy. To ensure the products and /or services provide the required capability on-time and within budget, project resources, activities, schedules, tools, and reviews are defined. Additionally, security certification and accreditation activities begin with the identification of system security requirements and the completion of a high level vulnerability assessment (White, 2007).

Functional user requirements are formally defined and delineate the requirements in terms of data, system performance, security, and maintainability requirements for the system. All requirements are defined to a level of detail sufficient for systems design to proceed. All requirements need to be measurable and testable and relate to the business need or opportunity identified in the Initiation Phase.

The physical characteristics of the system are designed during this phase. The operating environment is established, major subsystems and their inputs and outputs are defined, and processes are allocated to resources. Everything requiring user input or approval must be documented and reviewed by the user. The physical characteristics of the system are

specified and a detailed design is prepared. Subsystems identified during design are used to create a detailed structure of the system. Each subsystem is partitioned into one or more design units or modules. Detailed logic specifications are prepared for each software module.

The detailed specifications produced during the design phase are translated into hardware, communications, and executable software. Software shall be unit tested, integrated, and retested in a systematic manner. Hardware is assembled and tested.

The various components of the system are integrated and systematically tested. The user tests the system to ensure that the functional requirements, as defined in the ftmctional requirements document, are satisfied by the developed or modified system. Prior to installing and operating the system in a production environment, the system must undergo certification and accreditation activities, the system must be tested by users by the quality assurance (QA) team. The system or system modifications are installed and made operational in a production environment. Design and QA tools like java, Bugzilla, net beans, subversion, tomcat and jboss are utilized in this activities, based on the platform in which the ISs is running. The phase is initiated after the system has been tested and accepted by the user. This phase continues until the system is operating in production in accordance with the defined user requirements.

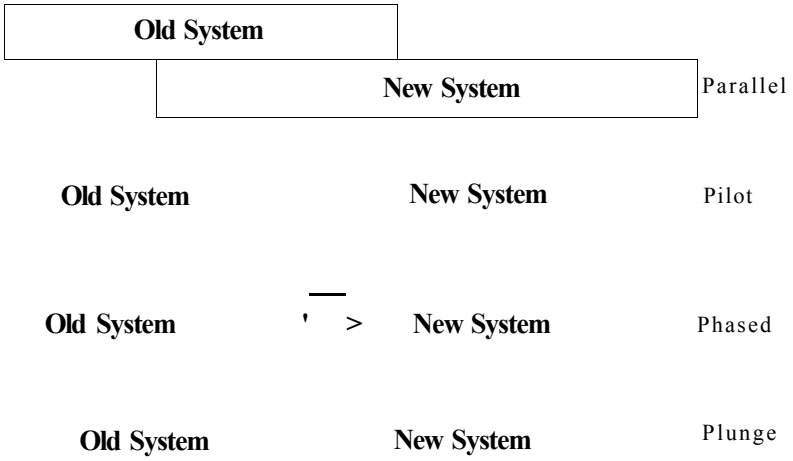
2.3 Information Systems Implementation

According to Bocij (2003) information systems implementation involves the changeover from an old system to new system. Implementation begin with development of a cutover proposal by the project implementation team to the management informing them that its time to implement the new system. Before implementation a few tasks need to be performed these may include the development of manuals and providing training. Manuals will contain information on how to use the new system and should be distributed to all the people who will be using the new system. These manuals should be written in consultation with a sample of users of the new system to ensure that the directions contained in the manuals are easily understood. The people who will be using the new system should be trained. Training should take place very close to the time of actual cutover. It is usually a waste of time to train people on new system more than a week or two before the new system is implemented because most people simply forget what they learned in the training season after some time has passed.

During ISs implementation, management can follow one of the four basic cutover approaches; pilot, immediate, phased and parallel. A pilot cutover is a trial system that is usually implemented in a single location like an office or geographical area. The pilot allows developers to see how the users react to the new system and possibly change some features of the new system if necessary or feasible. If changing of the new system is not feasible pilot will reveal some of the things that might be included in the training sessions and user manuals development. However pilot may take considerable time. Obviously an immediate cutover over will be a lot simpler (Bocij, 2003).

In the immediate change over, the organization simply turns the old system off and the new system on. This might work well for small scale ISs, but, since users have to leam new set of commands it can reduce staff productivity. In this case, it will be advisable to engage parallel cutover, where end users are allowed to work with both systems until they be come accustomed to the features of the new system. Finally a new system can be phased in, meaning that different modules of the system are added at different times or different locations. Phased implementation is popular when an organization is planning on integrating a variety of application that have the potential benefits of sharing data.

Figure 1: Major Forms of Conversion to the New ISs.



Data conversion is one of the most complex and risky activities in ISs implementation. Data from legacy systems must therefore be corrected or further processed to meet the new rules before it can be fed into the system. Further, this activity must be conducted in a compressed time frame to minimize disrupting business during the switch from the legacy to the new

system. Compared to private sector organizations, parastata!, convert significantly larger volumes of data, this is due to the legal and system integration requirements associated with fund accounting. Therefore, the only way to minimize the risks associated with data conversion is to practice repeated testing and checking validity during integration.

Once a new system has been implemented, it enters the maintenance phase. If the new system has been properly planned, analyzed, designed, and implemented, maintenance is usually a simple matter. It may involve some simple debugging of the system or adding minor enhancements. However, if any of the preceding design and development steps have been skipped or been done poorly, maintenance can become a night mare as technicians can spend tremendous amount of time trying to fix the new system in order to do what it was envisioned to do. Unfortunately, possible issues about system maintenance that might arise during design and implementation phases are in most cases overlooked causing headache like system crashes and added cost like hiring additional support personnel to keep the system up and running. However, if the system has been designed properly maintenance is normally a fairly straight forward matter (Senn, 1990).

Sustained success of any ISs implementation is directly dependent on the availability of individuals with the proper process and system knowledge to support it. For most part, the project team gains this knowledge during implementation trough training and during prototyping.

Parastatal are often faced with situation where talented employees step up to the task of working on a project temporarily and then return to their former positions with little or no direct responsibilities for the stabilization and maintenance of the ISs. As a result, much of the critical knowledge transferred to officer during the implementation becomes unavailable to the support team during the production support phase. Parastatal must create incentives to retain the individuals who have made the effort to acquire this knowledge; otherwise, they will become more dependent on external contractors to support their critical administrative systems and processes (Senn, 1990).

2.4 Information Systems implementation challenges

Parastatal are constantly bombarded with many ongoing internal and external pressures that influence the necessity for potential changes within the ISs infrastructure. The organization, therefore, must either take on the challenges of implementing new ISs or accept whatever the consequences that may be limiting ISs development. Whereas businesses sector must continuously grow organically to survive, parastatal must constantly adapt to the changes in the marketplace and diversify to meet the changing global demands. This means that the requirements of the ISs will also change and "utilize the power of technology to meet the ongoing needs of the organization" (Senn, 1990).

With the development of ISs there is always the hope for seamless ISs implementation and the citizens expects that there will be no interruptions of government services. However, there are many opportunities for things to go wrong during ISs implementation and parastatal take a number of risks when embarking on this course of action (Maguire, 2002). The challenges identified are split into four categories. These include; human issues, operational issues, technical issues; and financial issues.

2.4.1 Human issues

Human issues relate to the interpersonal skills of the individuals involved with the project and come into play starting with the pre-planning stage, the approval process, project planning and project implementation through the transition to production status. Burke et al (2001) suggest that human issues have the biggest impact on the processes as they argue that when implementation is successful, it is because a focused attention was paid to the human issues. The following human issues have been identified.

Poor Project Management

Very few organizations have the experience in house to run such a complex project as implementing a large-scale integrated solution. Many parastatals usually engage outside contractors to come and manage the implementation process. Implementation of projects needs involvement of senior executive to ensure that the right participation mix of Business and IT is done and to resolve conflicts (Turbit, 2005).

Lack of user skills and awareness

Burke et al (2001) identified poor skill sets among users as an issue. This view is supported by research by META Group (2004) that indicated that more than 75% of organizations identified lack user awareness as a challenging factor. Furthermore, in the same study, 66% of organizations identified lack of executive awareness as having a similar affect.

Martin Harvey, the director of IT user skills at e-skills UK. states that lack of user skills is "a major problem" which is supported by a recent study showing that '7.6 million employees needed improved IT skills out of the 21.5 million IT-using work forces (Murray, 2007). It is also suggested by Turbit (2005) that when upgrading from old technology, the skills of staff need to be upgraded as well. The upgrade will place significant demands on a team who are geared to maintain an old but stable environment, usually this effort is underestimated.

Most of the users fear ISs due to lack of skills and awareness, they view ISs as a challenge to their profession or career. ICT is an area which keeps on changing therefore staff need to upgrade skills with respect to the new software that comes into use, in order to keep in line with changing environment.

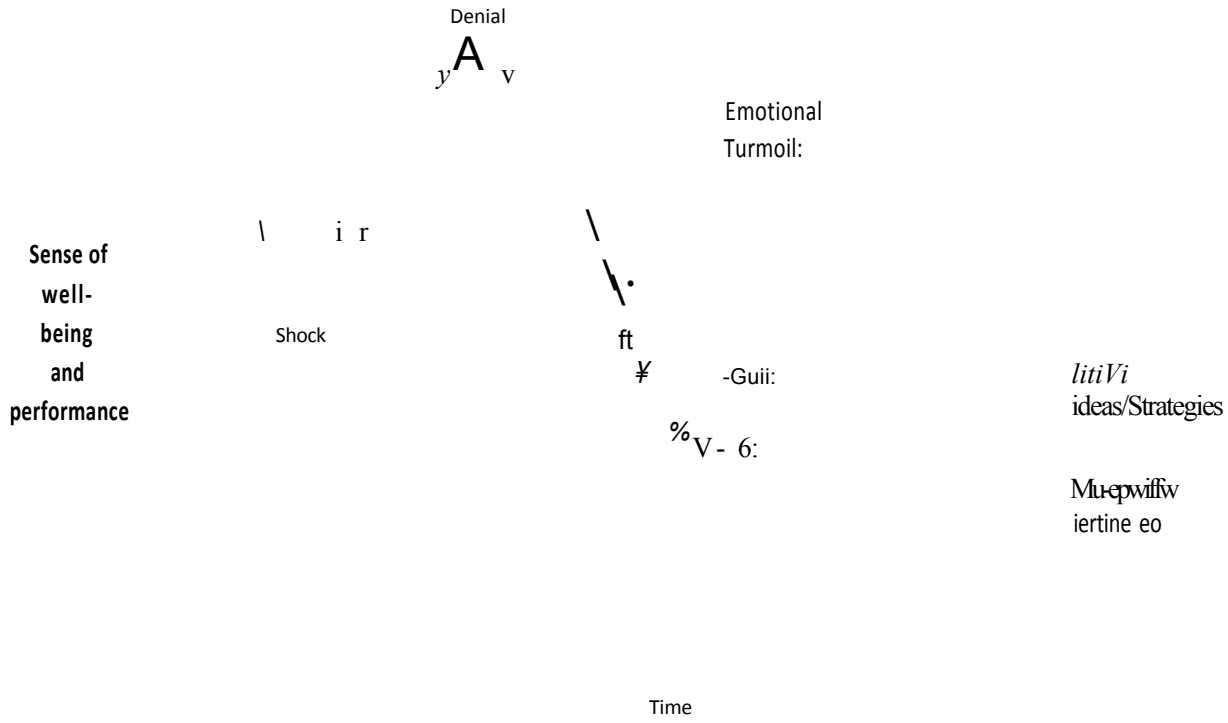
Resistance to change

This is a refusal to see benefits of a new system because of what is known works for an individual (Burke et al, 2001). A case study based on Hayward Gordon Ltd. (HGL) in 2004 revealed that one of their major human issues was that people can become lazy and copy electronic records. A study by Gupta (2000) revealed that the main hurdle faced by most companies was the resistance to change. He expanded on this by explaining that the resistance was due to employees being reluctant to learn new techniques or the IT department was reluctant to change due to its attachment to the product. Employees play an important role as Maguire (2000) identifies that the "vast majority of ISs are used by staff within organizations". Maguire (2000) also notes that there are still too many examples of ISs projects that have failed due to increasing problems of rising costs and the misuse of IS rather than acceptance and use of the system. Even with significant effort to ensure that system implementation is successful, many systems encounter resistance from potential users and others within the organization.

Resistance to change is defined by Alter (1999) as "any action or inaction that obstructs a change process" and has been found to be a major factor in the implementation of ISs, as research has shown that nearly two-thirds of major change programs prove unsuccessful and the primary reason for this is not lack of skill or resources, but resistance (Waddell, 2002). Resistance to change normally follows a defined pattern which Adams et ai. (cited in Chaffey, 2002) describes as a 'transition curve' that describes the reactions from staff first hearing about the system through to acceptance of the change (see Figure 2). Bostrom et al (1977) suggest that ideally the person guiding the business people into ICT should not be an ICT professional. In this way they will appear less threatening and less likely to use unfamiliar jargon or expect the users to acquire knowledge and skills quickly.

During this initiation process users must also be made aware of the realities of learning to use computers, for example it must be pointed out that they are expected to make mistakes and encouraged to learn from this mistakes and not discouraged by them (Saunders, 2003).

Figure 2: Transition Curve Indicating Staff Reactions to Change.



(Adapted from Chaffey, 2002)

Benign Neglect

Ignoring the situation and refusing to stay on track or fulfil responsibilities (Burke et al, 2001) means there is a lack of focus on the project which indicates that the organization is not very determined to make the ISs successful.

Benign neglect is mostly displayed by the users as if they are against the implementation of the ISs. They may refuse to take part in making the system successful. This is also linked with resistance to change. Employee may refuse to stay on track due to a number of reasons these include if they were not consulted at the initial stages.

Inadequate Staffing

Organizations do not always have enough staff available for the successful of implementation of ISs (Burke et al, 2001). Lack of staff will mean that the organization may be unable to perform necessary activities such as testing and may significantly affect the time scale of the project.

Scope Creep

Implementing features outside the original scope and adding features unsystematically ultimately makes ISs harder to use (Burke et al, 2001). Organizations that have specific plans or requirements are most likely to deter from it as they keep adding changes in order to cater to everyone's needs. Most users keep on raising new requirements as they get used to the ISs. The more enhancements to be made into ISs the more the challenges. Managing the scope is very difficult in many parastatals.

Political Battles and perfectionism

Who is responsible for what? Who owns what information? can cause rifts between departments which ultimately will affect the implementation of a system as communication may break down along with lack of departmental cooperation. In public organizations power struggles' and employee relations often occur leading to implementation challenges (Burke et al, 2001)

Perfectionism occur when users refuse to use the ISs because it is not working exactly as specified. In information systems projects implementation, a huge amount of work requires the analysis of data and input from many people, which could have significant consequences

later on in the project, causing even something dramatic as redesign and re-implementation (Burke et al, 2001).

Lack of Experience

A case study based on Mascot Truck Parts cited in Maguire (2002) revealed that they had problems implementing a new IS because they did not have enough experience with regards to the processes involved and incidentally the system was not setup properly.

In any business the use of personnel with specialized skills enhances the ability of a parastatal to be successful in implementing large, complex, or difficult tasks. It allows for both deeper and stronger skills and the contribution of differing perspectives. Technical people who can be highly effective in approach task from different perspectives are rare, that is why sooner or later organizations bring in specialists.

2.4.2 Operational issues

Operational factors are those that affect the flow of information transactions within the business. The following operational factors have been identified:

Changing Business Processes

Its difficult to draw the line between changing business processes to suit the system or retaining Business Processes and paying the cost, in money and time. Time and cost squeeze the implementation, so the usual path is not to modify the system, but to change the way people work (Turbit, 2005).

Poor Planning is also a critical challenge to successful system implementation. Planning covers several areas such as having a strong Business Case, to the availability of users to make decisions on configuration, to investing in a plan that captures all the issues associated with implementation. A case study based on Pestell Group in cited in Maguire (2002) revealed that they had problems with getting their information system up and running on time due to inefficient planning. Planning is essential in information systems development as the better the plan, the better the result will be.

Process Rework

Process rework Turbit (2005) occurs when processes are not clearly defined at an early stage in a project, meaning that further down the line processes have to be changed which can have an affect on the system requirements. Finding a problem later in the process can be significantly more expensive to fix than one found early on in the process.

Time Constraints may also lead to unexpected problems. Time overruns identified by Gupta (2000) can mainly be due to unexpected problems and poor project management. However, every project has its unexpected delays, those which cannot be foreseen; very important is how the organization is able to deal with the situation that determines the impact.

2.4.3 Technical issues

Technical factors are those that affect the technological side of an organization. The following *technical* factors *have been identified:*

Technology Trials

The effort to build interfaces, change reports, customize software and convert data is normally underestimated. To collect new data and clean the data being converted will also require an effort that is beyond what is normally expected (Turbit, 2005). An organization may employ an individual especially to perform required tasks; however this can present a dilemma. An external individual hired may have little or no knowledge of the organization and its processes therefore timescales may be affected. An internal employee hired may have to fore-go their current responsibilities in order to perform the required tasks, which may have a negative impact on the organization.

Complying with rules and requirements

Aerospace Welding Inc also experienced this as a challenge due to the nature of their business which requires them to comply with strict rules and requirements and this had to be taken into consideration with regards to their information system. Many organizations are ISO certified today and have embraced best practices in IT service management. Following this procedure and guidelines or standards sometimes delays service delivery.

Integration and Specific module of IS not working as expected

A case study based on Multivans cited in Maguire (2002) revealed that they had problems with specific modules within their information system not correctly performing. The problem

was that their currency module was not working, meaning that they were unable to do business with foreign customers. In situations where modules work, Lack of integration is some times experienced.

Mascot Truck Parts and HGL both experienced a lack of integration of their ISs. Many organization have departments which deal with a unique task however, the department share a number of information due to lack of integration, the organization end up with a combination of a working system and manual system at one point.

Automation consists of a range of capabilities from simple system that assists the operation in performing complicated tasks in system to those that are capable of performing complicated tasks. In order achieve maximum efficiency, accuracy, elimination of errors, emission, high quality control, waste reduction; integration of business system is needed for increased productivity and reduction of labour cost.

Customizations Required

The case study based on Pestell Group also revealed that a significant amount of customizations were required which complicated the implementation process. This is similar to the problem experienced by Multivans, as a number of customizations were required in order to enable them to do business with foreign customers.

Secondly, resisting the urge to customize occurs when the users are not willing to customize the system instead they use it the way it is especially ERPs due to fears of future system upgrades. The case study based on Hood Flexible Packaging Corp. also revealed that they found it challenging not to go down the route of customization. This was because they felt that this would create more problems when it is time to upgrade the system. This can be related to the findings of Gupta (2000) who stated that a continuous problem has proven to be the decision whether to customize or not.

Compatibility Issues

Gupta (2000) mentions that in one case during the implementation of an IS project teams tackled a broad spectrum of issues and problems which include personal computer compatibility issues.

Automation involves the functioning of systems, equipments in a desired manner at the proper time under control of mechanical or electrical devises that operate without human intervention. In addition, networking issues affect system availability and operation speed. Gutpa (2000) states that, many common problems with regards to ISs implementation are based around networking issues. These can include problems such as configuring the entire PC's to use the new information system and exchange information. Slow network infrastructure and low band width sometimes pose challenge in the implementation of system as the system operates slowly thus, limiting expected benefit of quick transaction processing.

Appropriate hardware is very essential for automation. Software engineers require continuous process improvement due to aging and obsolescence of the software, the aging is due to advances in software technology. This requires appropriate computer hardware (Gutpa, 2000). The hardware in place should be adequate. Old and outdated hardware to run new software can be of challenge. If the hardware in place are old they should be upgraded in order to meet the appropriate level of operations.

2.4.4 Financial issues

Financial issues are those that affect the finance side of an organization. The Following financial issues have been identified:

Cost overruns

Cost overruns can be linked to poor planning and can be due to the underestimation of resources (Turbit, 2005) in relation to budgets, consulting fees, hardware costs and software costs. The disadvantages of automation are high initial costs and increased dependence on maintenance.

The level of automation should be at the required level to achieve maximum efficiency of operations (Lynn, 2002). Many parastatal faces a chronic shortage of resources including funding. The management should be aware that automation is part of the complex and general economic structure and success of the automation depend on that structure, as well as the optimum allocation of resources on time.

2.5 Change Management

Change Management is defined as "managing process, structural, technical, staff and culture change within an organization" (Chaffey, 2002) and is also seen as setting expectations that lessen the pain of change (Turbit, 2005). People involved in a change expect to go from A to B. Perhaps where they are actually going is C. Change Management can be used to combat resistance to change as it is about getting them used to the idea that C is the real destination (Alter, 1999).

2.6 Literature Review Conclusion

After reviewing the literature it is clear that there are many challenges faced by organizations in the implementation of information systems not the least of which can be attributed to human issues. The primary conclusion, however, is that although implementation methods, scope and costs can vary from organization to organization the underlying challenges experienced by each are fundamentally consistent.

The need for effective information systems development and implementation is inescapable for parastatal and constitute an integral factor in the ongoing development of the business processes. Therefore, despite the many challenges involved, organizations today are literally being forced into the implementation of information systems for their very survival. This study will investigate the issues raised by the literature and explore the practise and challenges faced by parastatal in Kenya which can then be used to draw comparisons with the existing literature.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research Design

This study adopted a survey research design. The survey design was preferred because the researcher intended to collect cross sectional data on the practice and challenges of information systems implementation in Kenyan state parastatals. In addition, it allowed large amounts of data to be collected from a substantial population in an efficient manner. Although survey design was time consuming, the method was useful as it allowed comparisons to be made easily from the results, (Saunders, 2003).

3.2. Population

The study population comprised of IT officers from state parastatals in Kenya targeting 50% of the total population (see appendix 2). This is because out of the 123 gazetted parastatals some of the parastatal were new and a number of them had not acquired substantial ISs hence, their responses could not have given the actual practices and challenges of ISs implementation. To avoid this category of parastatals whose responses could have distorted the results, a sample of 50% i.e. (65 parastatals) was selected. Only IT officers or managers who had implemented ISs in state parastatals were given the questionnaires to respond. Due to large sample size, only one respondent was be targeted to provide responses to the questionnaires. In addition, it was deemed that the views may not vary much even if more than one respondent could have been interviewed from the same organization. The sampling method was judgmental.

3.3. Data Collection

The study relied heavily on primary data which was collected by use of structured questionnaire. The questionnaire was appropriate since the researcher did not need to be present to collect the data (Chisnall, 2005), since the study covered samples from a wide area of parastatals across the country.

The questionnaires were distributed through 'drop and pick' method and in some cases by email. There was follow-up by to ensure that questionnaires were collected on time as well as to assist respondents who had difficulty in completing the questionnaires. The questionnaire

was divided into three sections, Section A; captured biodata of the respondents, Section B: captured information on the practice of IS implementation in parastatai while Section C: captured respondent's perception on the challenges of IS implementation in state parastatai. The practice was measured by yes or no questions, while the challenges were measured by questionnaire with a scale ranging from strongly disagree, disagree, neutral, agree and strongly agree.

3.4. Data Analysis

Data collected from the respondents in state parastatals countrywide were coded, edited for completeness, labeled, and keyed into the computer for analysis with the aid of Statistical Package for Social Sciences (SPSS).

Data from section A and B were analyzed using descriptive statistics and presented as percentages, tables, and graphs. Descriptive statistics enabled meaningful description of the distribution of scores or measurements using a few indices or statistics.

In order to determine the challenges of ISs implementation, factor analysis was used to extract factors that measured study variables. Principal component analysis and virimax rotation methods were used in the extraction of factors with eigen values greater than 1. which constituted 82.7% of total variance of ISs implementation challenges using Kaiser Rule. The factors were then presented in a tabular form. A total of 53 questionnaire collected were adequate for factor analysis Field, (2005). Only values with rotated component values of more than 0.4 were selected.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND FINDINGS

4.1 Overview

This Chapter presents the analysis and findings of the study. It provides general information of the study sample (IT officers in Kenyan state parastatal) on the practice and challenges of information systems implementation.

A sample of 65 IT officers constituting 50% of the total population of 123 state parastatal in Kenya was selected through judgmental sampling technique. An overall response rate of about 82% percent of the targeted sample was realized. The analysis was done using the 53 filled and returned questionnaires out of the 65 questionnaires distributed. Since the number of questionnaire collected was more than 50, this was deemed adequate and sufficient for purposes of data analysis especially for factor analysis as suggested by Field, (2005).

The respondents were quite cooperative and the data provided was taken to be a true representation of the respondents' views due to the independence of the study carried out. However, some of the parastatals did not have established information systems (ISs) in their operations; hence the respondents were not able to fill the questionnaires provided. This therefore reduced the response rate by 18%. The analysis of the data was used to establish the practice and to identify the challenges of ISs implementation in state parastatal. Further more the data was also used to relate back the experiences of respondents (IT officers from state parastatal in Kenya) to the findings of the literature.

4.2 Demographics

The respondents were asked to profile their details in the questionnaire provided, '['he results were analyzed as percentage of the number of respondents in the respective parastatals. The findings indicate that the respondents represented a broad range of employees profile in terms of gender, age, education level, designation, and duration they have worked in the current organization. All the respondents were employees who run, manage and maintain IT projects in state parastatal.

Table 1: Respondent's Gender

Gender	Percent	Cumulative Percent
Male	62	62
Female	38	100
Total	100	

Source: Research Data (2009)

From Table 1, male respondents constituted 62% while the female respondents comprised of 38%. It was noted that, different parastatal use different title for various designations, however their title were categorised into the five designations shown in the Figure 3.

Figure 3: Designations of the Respondents

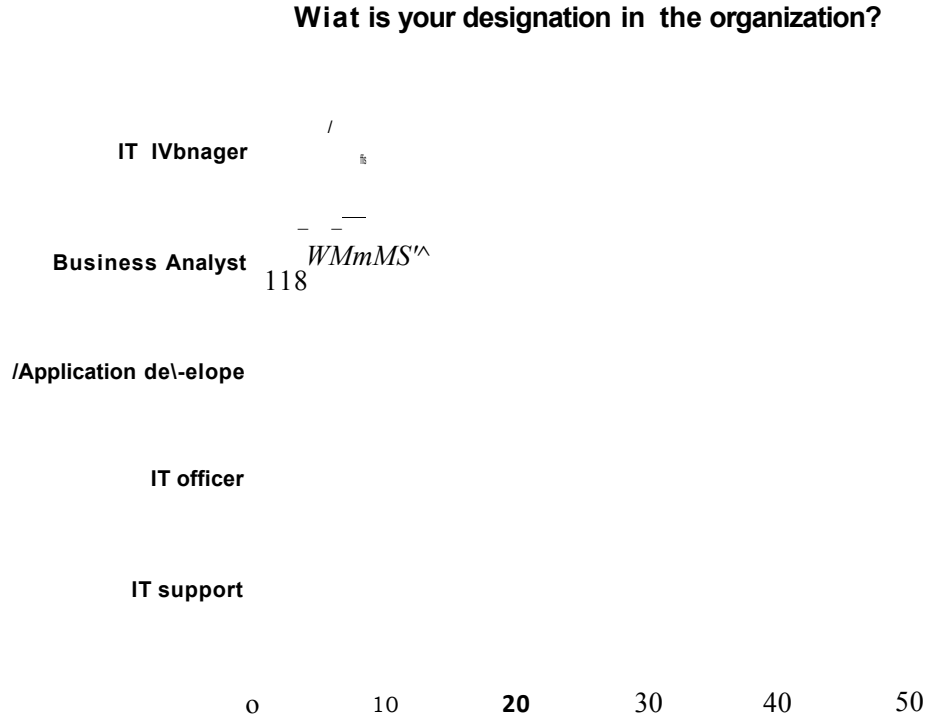


Figure 3 shows that, the respondents held a wide range of job types. About 42% held the position of IT officer, 23% Business Analyst, 21% IT manager, 5% programmer/Application Developer and 9% Support Analysts. On average majority about 48% of the respondent had held their current position for less than five years, 33% between 5-10 years and the remaining about 19% held their position for more than 10 years, meaning that more than 50% of the respondents were experienced professional, who understood ISs practise and challenges.

Figure 4: Current Educational Level of the Respondents.

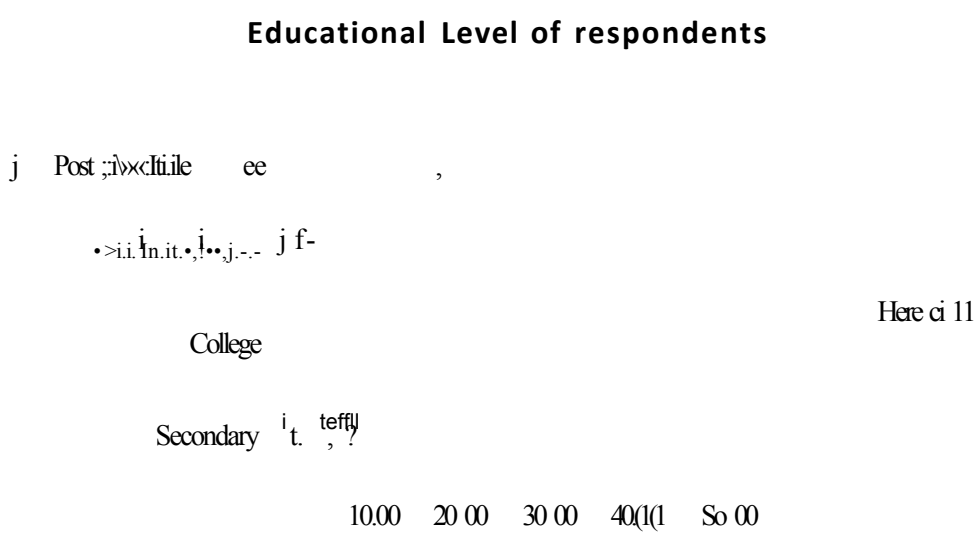


Figure 4 shows that, about 42% of the participants had a graduate degree from the university, 28% postgraduate university degree, 25% had college certificate and a further 6 % had only high school qualification.

Table 2: Respondents Age

Respondent Age	Percent	Cumulative Percent
21 - 25 yrs	5.7	5.7
26 - 30 yrs	30.2	35.8
31 -35 yrs	35.8	71.7
36 - 40 yrs	13.2	84.9
41 -45 yrs	-11.3	96.2
46 - 50 yrs	3.8	100.0
Total	100	

Source: Research Data (2009)

From Table 2, about 66% of the respondents were aged between 26-35 years, meaning that majority of respondent were young people, while a small percent 28% were aged above 37 years and the rest 6% were aged below 26 years.

4.3 The Practice of Information Systems Implementation in Parastatal

The first objective of the study sought to establish the practice of ISs implementation in state parastatals. The questionnaire had three questions that addressed this objective. From the respondents who filled the questionnaire the results were presented using percentages and

tables. The respondents were asked to state the reasons for implementing ISs in their organizations. The scores were tabulated and ranked as follows

Table 3: Reasons for Implementing Information Systems

Reasons	% of positive responses	Rank
Need for system integration	67	1
Need to streamline business process operations	67	2
Limitations of the current systems	26	3
Need to share information	24	4
Executive of orders	23	5

Source: Research Data (2009)

Table 3 shows that, about 67% of the respondents agreed that the primary reason for implementing ISs in state parastatal is to integrate ISs and streamline business processes operations in their organization. Other reasons included, limitations of the current system, need to share information and orders from the government.

The initiation of ISs begins with identification of business need or opportunity. About 72% of the participants agreed that ISs requirements relate to identified needs or opportunity for the organization, ISs projects are cost centre which require justification of the huge expenditure involved, primarily to meet the organizational needs in terms of service delivery and efficiency. About 55% of the respondent agreed that, ISs are initiated by functional department, 53% by IT department, 34% by top management, 25% by the government, while 2% are initiated by donors. Meaning it is the business departments (i.e. finance, Human resource etc) that drive automations in state parastatal, hence there is a high degree of ownership of the ISs. The method of conversion from legacy to the new system affects the implementation of ISs. The respondents were asked to state the preferred conversion method of ISs implementation in their organization.

Figure 5: Information Systems Conversion Method

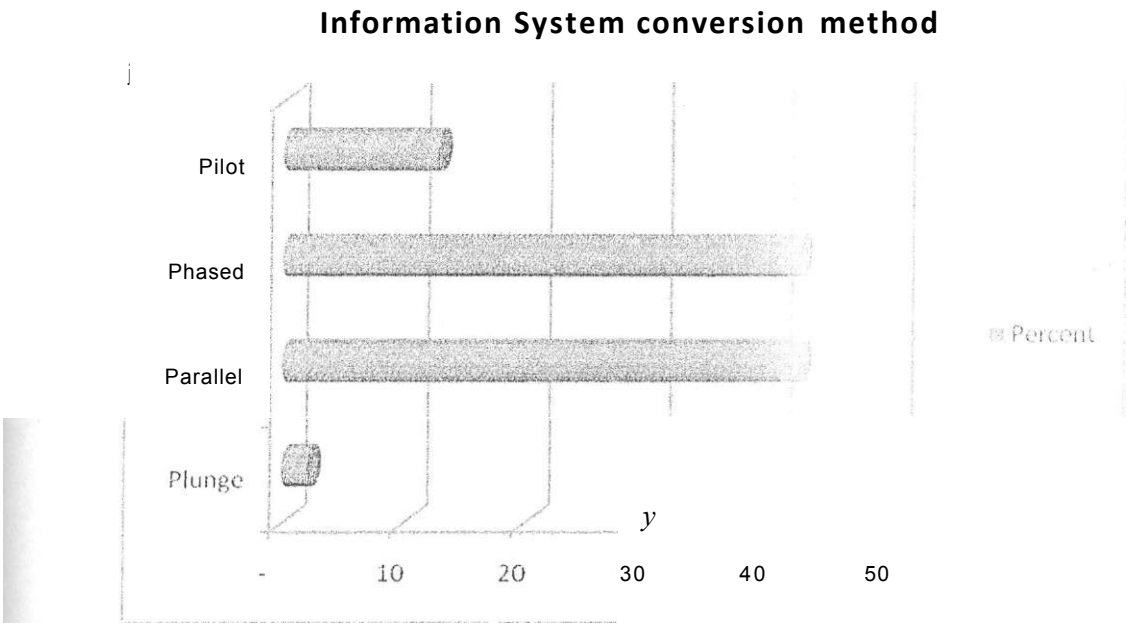


Figure 5 shows that phased and parallel conversion were the mostly used methods to change from legacy to the new system. This allows the organization enough time to prepare for changeover without disrupting normal operations. About 45% use in-house development in the acquisition of ISs, 45% use outsourcing, 35% customization and another 17% use off-self.

The respondents were asked to state the stages of ISs development where their organization experience challenges most. The results were presented as shown in Table 4.

Table 4: Information Systems Development Stage Where Challenges are Experienced

Implementation Stage	Percent	Cumulative Percent
System Investigation	8	8
System implementation	40	48
System analysis	12	60
System maintenance	35	94
System Design	6	100
Total	100	

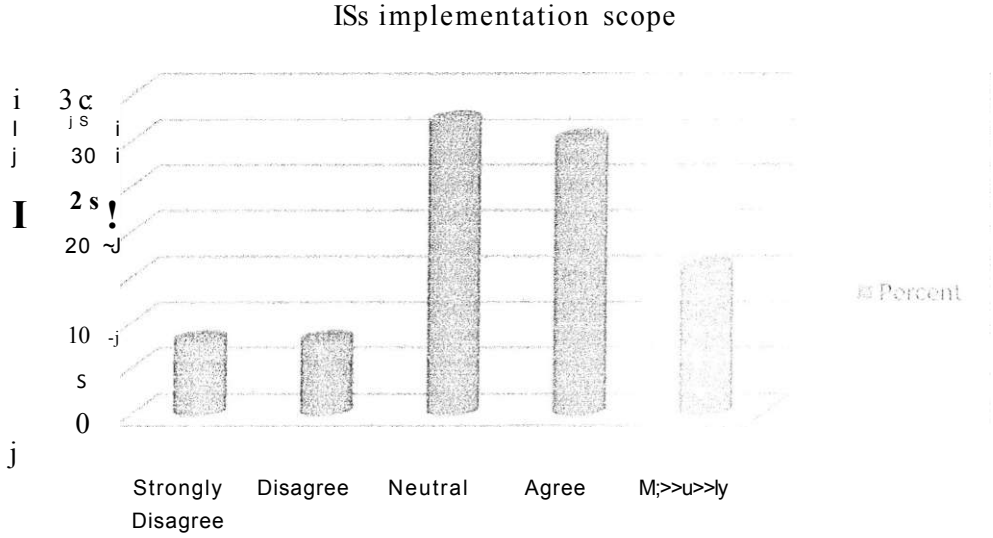
Source: Research Data (2009)

From Table 4, about 40% of the respondents experience challenges most during ISs implementation, 35% during system maintenance and 12% during analysis.

4.4 Information Systems Development Practice

The respondents were asked the extent to which they agree or disagree on a number of issues as a practice of ISs development. The results were analysed by use of percentage based on the number of the responses received. From the analysis, 66% of the respondents agreed that ISs requirements are defined by users, meaning there is user involvement in the definition of the user requirements. The remaining substantial number of respondents 35% implies that some parastatal do not involve users in requirement definition, which may lead to resistance of users to the system (Senn, 1990).

Figure 6: Information Systems Implementation Scope



From Figure 6, about 30% of the respondents agreed that the implementation scope is defined before ISs implementation, however, 32% had neutral views on the same, meaning, although a substantial number of respondents 53% are not in agreement on the same. Lack of clear scope can lead to scope creep thus, affecting ISs implementation. In addition a decrease in the scope reduces the benefits of the system while widening the scope too much dramatically increases the risk of schedule delays and cost overruns. The finding is in agreement with the literature (Turbit, 2005).

Parastatal implementing information systems in their organizations should select an achievable scope to build confidence of the organizations ability to succeed in information system solution (Bocij, 2003). About 60% agreed that there is justification for every ISs envisioned by the organization and about 58% develops a detailed work plans, meaning the ISs initiatives are justified and well planned before implementation, however about 42%, a

substantial population disagreed that work plans are developed in their organizations. Lack of a work plan implies that ISs implementation may continue indefinitely. In addition, state parastatal in Kenya risk the problems of getting the systems up and running on time (Maguire, 2002).

Figure 7: User Acceptance and System Testing

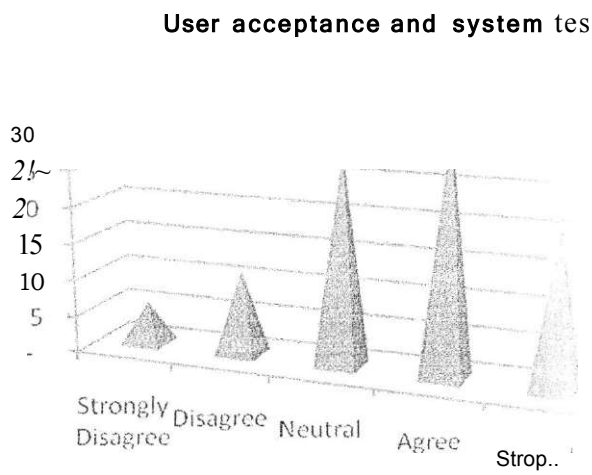


Figure 7 shows that, about 54% of the respondents agreed that there is user acceptance and system testing prior to ISs implementation, 29% were neutral, the remaining 17% disagreed. Lack of user acceptance and system testing can lead resistance and lack of ownership of ISs in parastatal, thus leading to challenges during ISs implementation. Users should sign acceptance certificate agreeing that all the envisioned functionalities are working as per their need as a formal sign off certificate to reinforce ownership, the result show that 46% of the respondents agreed that the practice is not implemented in their organizations.

Detailed design specification of the physical characteristics of the ISs should be specified before system design or customization. About 67% of the respondents agreed that there is a detailed logical system specification for ISs developed in their organizations. The logical specifications defines the input and output functionalities of the envisioned ISs, however a substantial number of respondents (33%) disagreed that the same is done in their organizations, meaning users are likely to reject system that is not developed as per their preference.

4.5 The Practice Information Systems Implementation

To establish the practice of ISs implementation is state parastatal, respondents were asked to state if they agree or disagree with a number of issues in ISs implementation. The results were analysed using frequencies and presented in percentages based on the number of responses received. Information systems should not only be installed but, they should be monitored for continued performance until they reach a steady operational state.

Figure 8: Information System Monitoring for Continued Performance.

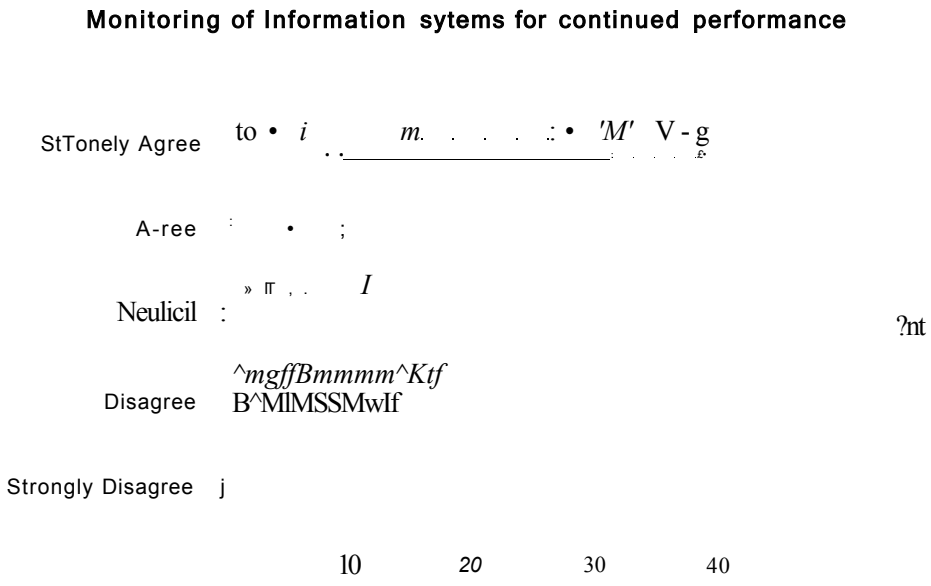


Figure 8 shows that, about 70% of the respondents agreed that ISs are installed and monitored for continuous performance, while 11% were neutral and 19% disagreed. Tack of monitoring will lead to users rejecting the ISs especially if they experience difficulties in using the system. About 90% of the respondents agreed that, desktop facilities, including hardware, software and other equipments are identified prior to ISs implementations, meaning state parastatal give attention to hardware supporting the proposed ISs. Further, 75% agreed that a checklist of all modules and functionality to be developed is prepared. However, only about 51% agreed that version control is done in their organizations, implying that, there is a possibility of a wrong version being deployed to the live environment. Everything requiring user input or approval must be documented and reviewed by the user

Table 5: Development of System Documentations

Response	Percent	Cumulative Percent
Yes	53	53
No	43	96
Don't Know	4	100
Total	100	

Source: Research Data (2009)

Table 5 shows that, about 53% of the respondents agreed that necessary documentation of ISs are developed. However, 43% of the respondents agreed that documentation is not developed at all. Only 51% agreed that the documentation developed are reviewed regularly, meaning that, any changes made to the existing system are not be documented as agreed by 49% of the respondents, implying that the documentation may be ineffective to the intended users. Lack of documentation may lead to difficulties for developers to maintain the system thus making the system rigid to the organization.

Definition of user roles is very important to ensure that, responsibility is clearly defined during ISs implementation process (Bocij, 2003). About 80% of respondents agreed that user roles are defined in their organizations prior to system implementation; another 58% agreed that the cut off date of current operation from the legacy system to the new system is communicated. Only about 36% of the respondents agreed that stress testing is done in their organization, an indication that there is possibility of system crush or down time if the system is stretched beyond normal operation, in addition, the organization may not be able to determine the maximum load for the ISs. A comprehensive go live plan is important in ISs implementation to ensure that all implementation activities and required resources are identified on time and anticipated risks are foreseen.

Table 6: Go Live Plan

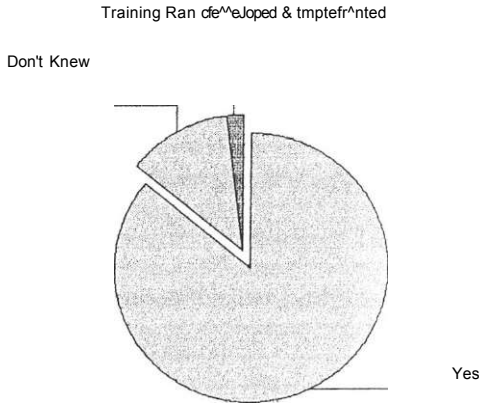
Responses	Percent	Cumulative Percent
Yes	64.6	64.6
No	22.9	87.5
Don't Know	12.5	100.0
Total	100.0	

Source: Research Data (2009)

From Table 6, about 64% of the respondents agreed that a go live plan is developed by their organization, while 23% do not. The accuracy of the system depends on the data input into the system whereas 68% of the respondents agreed that there is data cleanup before migration to the new system, 32% of the respondents were not sure of the same. Lack of data clean up

will affect the reliability and accuracy of the system, hence making users to lose confidence on the ISs.

Figure 9: Training Plan Development and Implementation



From figure 9, about 84% of the respondents agreed that a training plan is developed and implemented, thus reinforcing user acceptance and productivity in the use of the ISs. About 74% agreed that stakeholders are notified about the new ISs. It is important that communication plan is developed for ISs implementation. During implementation there will be many overlapping activities if appropriate structure is not developed users will have problems in channelling issue arising from the system during this critical stage of ISs buy in. About 66% of the respondents agreed that the reporting structures are developed and communicated in their organizations. Another 66% agreed that service desk location is identified and communicated to users. However, substantial percentage 34% agreed that they do not have go live structures and identified service desk location.

During the ISs implementation process, the learning curve of the users about the new system is low; lack of identified and communicated service desk location will lead to frustration of users especially if they get problems in using the system, thus prompting resistance. The changes to the ISs should be managed through clearly defined and communicated structures (Gupta, 2000). About 54% of the respondents agreed that the procedures for handling changes during the go live are documented and communicated.

Only 32% of the respondents agreed that they develop a detailed risk log and risk alleviation procedures. The purpose of risk log is to document all information about significant potential risk, their source, analysis and mitigation measures, in order to reduce the impact of the risk,

the findings show that, more than 51% of the respondents agreed that ISs risks in their organizations are not anticipated hence, making them vulnerable to potential challenges.

4.6 Information Systems Planning

About 78% of the respondents agreed that ISs implementation in state parastatal focuses on supporting functional departments, only 52% agreed that there is inadequate budget for ISs implementation. About 61% of the respondent's agreed that ISs projects are not initially donor funded. Nearly 60% disagreed that funding from donors on ISs comes when the project has started, meaning ISs implementation budget is planned for and availed on time in 60% of the parastatal, however, 40% do not.

Figure 10: Succession Training, Skills and Knowledge Transfer Systems.

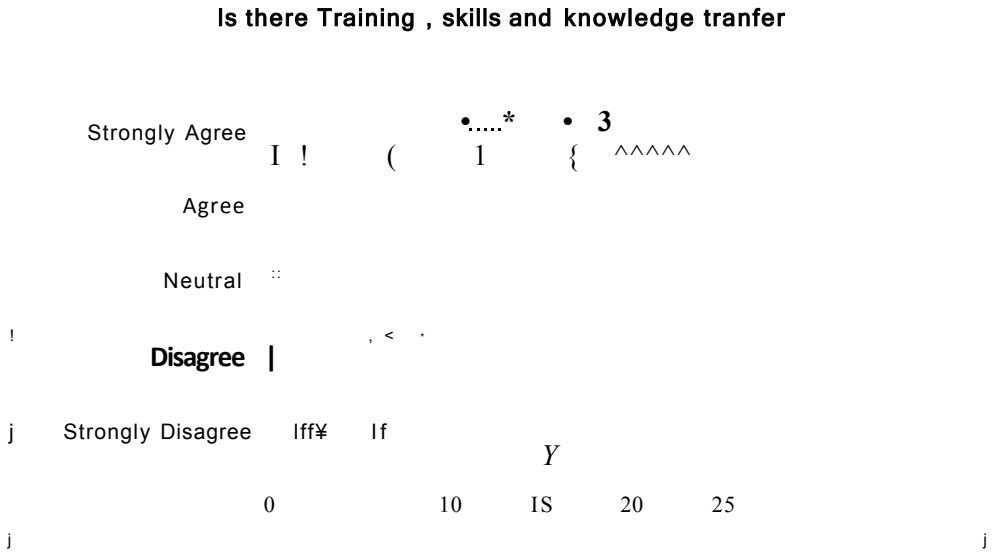


Figure 10 show that, only 17% strongly agreed that contracts for consultants include training, skills and knowledge transfer systems and another 29% agreed. Majority 33% were neutral while 20% disagreed. Lack of training, skills and knowledge transfer systems in contracts means that, consultants may implement ISs which cannot be supported in-house, thus exploding ISs cost, reducing user morale and productivity to the ISs.

Table 7: There is Established IT Department to Spearhead Information System Implementation.

Responses	Percent	Cumulative Percent
Strongly Disagree	8.0	8.0
Disagree	10.0	18.0
Neutral	12.0	30.0
Agree	20.0	50.0
Strongly Agree	50.0	100.0
Total	100.0	

Source: Research Data (2009)

From Table 7, about 50% strongly agreed that they had an established IT department to spearhead ISs implementation programmes, 20% agreed, with 12% neutral, 10% disagreeing and 8% strongly disagreed. Lack of IT department in state parastatal implies that appropriate policies, strategies and procedures on ISs implementation may be difficult to develop and enforce. In addition, lack of ISs development unit as agreed by majority of respondents 64% means the organizations will depend on the services of the consultants. Further, 78% agreed that they don't have an independent quality assurance unit to certify changes and system test. Further, majority of state parastatal may lack appropriate structures and tools necessary for ISs testing before deployment to the live environment.

From the above practice it is evident that majority of respondent agree that planning of ISs projects in state parastatal lack important components that are essential for smooth implementation of information system. Further comparison with literature indicates that some of the practices are likely cause of the challenges that face parastatal in ISs implementation. The findings agree with the rationale of the objective one of study that some of the practices may be the cause of the challenges faced in ISs implementation in state parastatal.

4.7 Information Systems Implementation Challenges

The second objective of the study sought to determine the challenges of ISs implementation in Kenyan state parastatal. From the literature review the researcher identified 40 variables that could be used to assess the challenges of ISs implementation in state parastatal. The variables were listed as follows.

1. Inadequate cost benefits analysis.
2. Lack of detailed installation plan.
3. Transfer of ICT champions.

4. Incompatibility of Files formats.
5. Difficulty in Data conversion.
6. Lack of appropriate tools for quality assurance.
7. Inadequate system testing.
8. Inappropriate design environment and tools.
9. Project managers lack project management skills.
10. Users lack the requisite skills.
11. Resistance to change.
12. Lack of funds.
13. Scope creep (uncontrolled changes in a project's).
14. Lack of consensus between senior managers.
15. Inadequate training.
16. Insufficient software evaluation.
17. Lack of expertise.
18. Use of inappropriate changeover process.
19. Poor planning and coordination.
20. Processes are not well defined.
21. Unrealistic project timelines.
22. Poor information systems interface.
23. Complying with too many rules.
24. Inadequate understanding of system capabilities.
25. Fear of customization.
26. Technical compatibility hardware/software.
27. Poor infrastructure/networks.
28. Cost overruns.
29. Inadequate communication.
30. Corruption.

31. High cost of licenses.

32. Slow procurement process.

33. Inadequate software specifications.

34. Inability to retain technical staff (turnover).

35. Limited support from user departments.

36. Lack of top management support.

37. Information systems security issues.

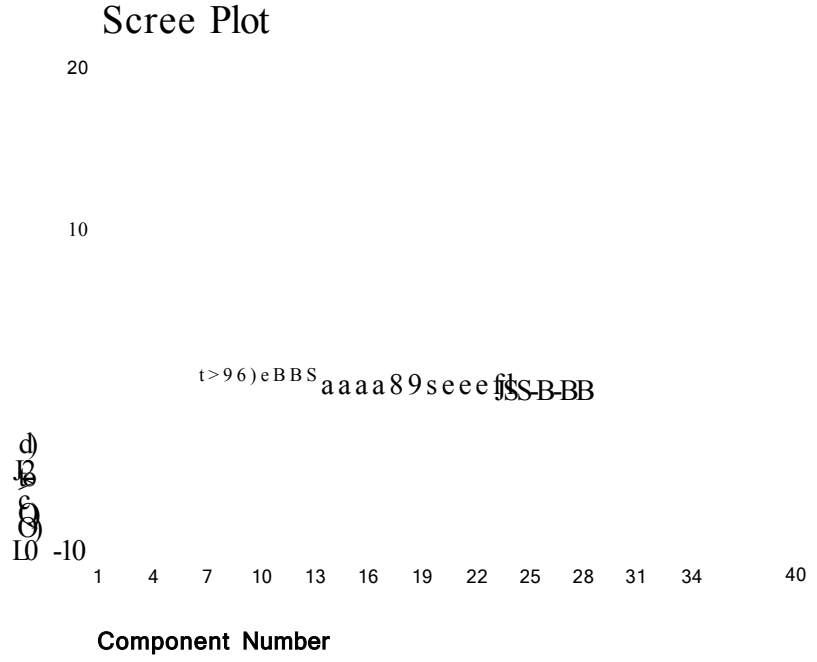
38. Bureaucracies in government projects.

39. Poor Leadership styles and attitude.

40. Lack of IT standards.

The variables were included in the questionnaire and the respondents were asked to state the extent to which they agreed with the statements in a Likert scale with; 5=Strongly Agree, 4= Agree 3=Neutral 2=Disagree l=Strongly Disagree. From factor analysis a total of 11 components with Eigen values greater than 1 accounted for 82.7% of the factor variance. The components were extracted and tabulated as shown in Appendix 4. The scree plot analysis, show that 11 components were retained as shown in Figure 11 with the steep slope supporting the findings in Appendix 4.

Figure 11: Scree Plot



Factor analysis, Principal Component Analysis (Appendix 4 and 5) was used to extract the key implementation challenges. This required Varimax with Kaiser Normalization which gave a rotation that converged in 14 iterations. The results were displayed in Table 8. From the component transformational matrix (Appendix 6), all the factors showed a positive correlation with each other. The correlation is significant at 0.01 level (2-tailed) and also significant at the 0.05 level (2-tailed). The analysis confirms that no single factor can summarize the challenges of ISs implementation in parastatal.

Table 8: Factor Analysis- Rotated Component Matrix

Challenges of ISs implementation	**Factor Component**
Processes are not well defined	**Process and Structural Challenges**
Poor planning and coordination	
Use of inappropriate changeover process	
Limited support from user departments.	
Lack of top management support.	
No suitable structure to support automation	
Poor leadership styles and attitude.	
Lack of IT standards	
Slow procurement process	**Procurement and Communication Challenges**
Complying with too many rules	
Transfer of ICT champions	
Inadequate understanding of system capabilities	
Fear of customization	
Lack of funds	
Inadequate communication	
Cost overruns	
Scope creep (uncontrolled changes in a project's)	**Information Systems Design and People Management Challenges**
Inadequate training	
Lack of consensus between senior managers	
Poor information systems interface	
Project Managers lack project management skills	
Incompatibility of files formats	**Database Design and**

Difficulty in Data conversion	**Conversion Challenges**
Lack of detailed installation plan	
User lacking the requisite skills	**Skills and Information Systems Security Challenges**
Resistance to change	
High cost of licences	
Information system security issues.	
Lack of appropriate tools for quality assurance	**Regulatory and Tools Challenges**
Bureaucracies in Government projects.	
Inappropriate Design environment and tools	
Corruption	**Corruption**
Inability to retain technical staff (turnover).	**Technical and Systems Tuning Challenges**
Unrealistic project timelines	
Inadequate system testing	
Poor infrastructure/network	
Technical compatibility hardware and software	**Hardware and Software Compatibility issues**
Inadequate software specifications	
Insufficient software evaluation	**Expertise in Software Evaluation**
Lack of expertise	
Inadequate cost benefits analysis	**Cost Benefit Analysis**

Source: Research Data (2009)

The factor extraction gave eleven components for analysis (Appendix 4 and 5). The variable components were the challenges faced by state parastatal in ISs implementation. From Table 8, Group factor 1 was composed of processes and structural challenges. These included; processes not well defined, poor planning and coordination, use of inappropriate changeover process, limited support from user departments, lack of top management support, no suitable structure to support automation, poor leadership styles/attitude and lack of IT standards.

Group factor 2 comprised of procurement and communication challenges which include; slow procurement process, complying with too many rules, transfer of ICT champions, inadequate understanding of system capabilities, fear of customization, lack of funds, inadequate communication and cost overruns.

Group factor 3 comprised of ISs Design and People Management Challenges, from the analysis; scope creep (uncontrolled changes in a project's), inadequate training, and lack of consensus between senior managers, poor information systems interface and lack of project management skills by project managers were the identified challenges.

Group factor 4 comprised of database design and conversion challenges. These included; incompatibility of files formats, difficulty in data conversion, and lack of detailed installation plan. Group factor 5 comprised of skills and IS security challenges. These challenges included; users lacking the requisite skills, resistance to change, high cost of licences and information system security issues.

Group factor 6 comprised of regulatory and tools challenges. These included; lack of appropriate tools for quality assurance, bureaucracies in government projects, inappropriate design environment and tools. Group factor 7 comprised of corruption and lack of transparency. While, Group factor 8 comprised of technical and system tuning issue. The group included; the inability to retain technical staff (turnover), unrealistic project timelines, inadequate system testing and poor infrastructure or networks.

Finally, Group factor 9 comprised of hardware and software compatibility issues; including; technical compatibility of hardware and software and inadequate software specifications. Group factor 10 comprised of expertise in software evaluation that listed; insufficient software evaluation and lack of expertise and Group factor 11 with only the challenge of cost benefit analysis.

It is clear that most of the factors listed in the questionnaire were grouped together by their correlation with each other, which brought down to a total of 11 main group factors. The most number of factors elements were in groups 1 to 3 with 7 and 11 having on iy one factor.

CHAPTER FIVE

SUMMARY AND CONCLUSION

5.1 Summary

This chapter summarizes and makes conclusions on the findings of the study in relation to the objectives as indicated in Chapter One. It also discusses the limitations of the study and recommendations for further research.

5.1.2 Demographic Information

The respondents were IT officers working in state parastatal. On average about 48% of the respondent had held their current position for less than five years, 33% between 5-10 years and the remaining 19% held their position for more than 10 years, meaning that more than 50% of the respondents were experienced professional, who understood ISs practise and challenges. About 42% of the participants had a graduate degree from the university, 28% postgraduate university degree, 25% had college certificate and a further 6 % had only high school qualification, meaning they were highly educated to provide ncccsssrv information for the study. About 66% of the respondents were aged between 26-35 years, meaning that majority of respondent were young, while a small percent 28% were aged above 37 years and the rest 6% were aged below 26 years.

5.1.3 The Practice of ISs Implementation

The general purpose of the study was to establish the practice of ISs implementation in state parastatals. Descriptive statistics was used to analyse the data, the results were presented in graphs and tables. The findings of the practice of ISs implementation in Kenyan state parastatals indicate that most state parastatals have adopted several practices in their ISS implementation. Although the approaches adopted have assisted parastatals to implement ISs, there is lack of; detailed ISs implementation work plan, user acceptance, system testing, version control, regular review of system documentation, stress testing and established IT department to spearhead ISs implementations. Further, parastatals lack appropriate policies, IT standards and procedures for handling changes to the ISs. In addition, the findings show that lack of detailed risk log and risk management procedures which are fundamental for successful ISs implementation.

5.1.4 The Challenges of ISs Implementation

The second objective sought to determine the challenges faced by state parastatals in ISs implementation. Factor analysis was used to group related challenges. The study found that Kenyan state parastatals experience the following challenges during ISs implementation. These include the challenge of; process and structure, procurement and communication, information systems design and people management, database design and conversion, skills and information systems security, regulatory and implementation tools, corruption, technical and systems tuning, software and hardware compatibility, expertise in software evaluation and the challenge of cost benefit analysis.

5.2 Conclusion

The findings established that a number of challenges affect ISs implementation. As observed in the literature the challenges tend tends to fall heavily on process and people management.

The parastatal have adopted a number of practices in ISs implementation at various stages of IS development, the good practices include; involving users in requirement definition, user departments initiating ISs projects thus increasing ownership, acquiring the required Hardware and infrastructure before ISs implementation. The study also noted that some practices are the cause of the observed challenges. The findings show that, parastatal experience the difficult in drawing the line between changing business process to suit the ISs. Instead of changing the way people work, they work towards modifying the system which end up squeezing time and implementation costs. In addition, ISs ends up documenting inefficiencies and redundancies because of poor process definition. Bureaucracies and corruption were evident in procurement process and awarding of contracts.

The study noted that, lack of consensus between senior managers and user departments in parastatals delays ISs implementations. The respondents identified file compatibility and data conversion issues from the legacy system to the new ISs was as a challenge that is limiting the benefit of quick transaction processing in their organization.

The respondents also identified lack of awareness among the managers as an area that can be improved for the successful implementation of ISs in state parastatal. The findings was in agreement with the study by burke et al (2001). The study established that implementing features outside the scope was common in parastatals as most users gets excited with the new

technology and desire to have everything automated. Managing the scope was established as major challenge to parastatals in IS implementation. As more features are added to the system the more the ISs become difficult to use.

Poor planning is a critical challenge to successful ISs implementation. As noted by Maguire, (2002), the respondents revealed that, they had a problem in having their ISs up and running on time due to inefficient planning, lack of expertise, lack of mechanisms to retain qualified professional leading to poor software evaluations. About 42% of the respondents agreed that communication is not adequately done. Most parastatal experience a number issues and problems related to desktop computers, and installed software on compatibility issues.

5.3 Recommendations

To improve the success of information systems implementation in state parastatals, the study recommends; improving planning and coordination of ISs projects, capacity building through user training, knowledge and skills transfer, transparency in procurement of information systems, reducing bureaucracies during ISs implementation, involvement of users in system analysis and requirement definition. The study also recommends embracing best practises, ISs monitoring, adoption of new tools and technologies for quality assurance to improve system testing. Human resource is a major driver for successful ISs, the study further recommends employing qualified managers to spearhead ISs implementation and empowering them through training. Parastatals should hire and retain qualified IT professional to implement ISs envisioned by the organization. Parastatals intending to implement ISs should establish and equip IT department which will spearhead automation, development of IT strategy and enterprise architecture.

5.4 Limitation of Study

Whereas there are many stages of ISs development, the study was limited to implementation stage of the SDLC. The limitation of the resources, made it difficult to obtain responses of all the parastatals in the country, in addition some of the parastatals did not have an established ISs hence, they had a problem in responding to the questionnaires provided thus limiting the response rate. The study therefore targeted only IT officers in state parastatals, the study did not interview other stakeholders like consultants providing services to the parastatals and

other key personnel from business departments like finance and HR who could have given more insights on ISs implementations challenges.

5.5 Recommendations for Further Study

Based on the above findings, the study recommends the following as areas of further research;

a) The impact of standards and best practises in ISs implementations in state parastatals.
b) IT structure and ISs implementation success in public sector.
c) ISs security issues in state parastatals.

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APPENDIXES

Appendix I: Questionnaire

This questionnaire has been designed to assist the researcher collect data concerning Information Systems Implementation Challenges in State Parastatal. You have been identified as one of the respondents in this study. Part A: contains questions on profiling, Part B: The current practice of ISs implementation and Part C: The challenges faced by parastatal in IS implementation. The information collected will be used for academic purpose only and confidentiality is highly assured.

Section A: Respondent Profile

Please provide information by ticking in the appropriate boxes [j.

1. What is your gender? Male [ ] Female [ ]
2. Your age bracket?

   Below 20 yrs [ ] 31-35 yrs [ ] 46-50 yrs [j
   21-25 yrs [ ] 36- 40 yrs [ ] Over 50 yrs [ ]
   26-30 yrs [] 41-45 yrs []
3. Kindly indicate you current level of education?

   Secondaiy [ ] College [ ] Graduate degree [ ]
   Post graduate degree [ ] Others (Please specify
4. What is your designation in the organization?

   IT Manager [ ] Business Analyst [ ] Application developer [J
   IT officer [ ] Others (please specify.....)
5. For how long have you worked in your organization?

   Less than 5 yrs [ ] 16-20yrs [ ] Over 30 yrs [ ]
   5-10 yrs [ ] 21-25 yrs [ ]
   11-15 yrs [] 26-30 yrs []

Section B: The practice of Information Systems Implementation

Please provide information about information systems implementation in your organization by ticking in the appropriate box after the choice

6. What are the reasons for implementing information systems in your organization (you may tick more than one choice)?

   Limitations of the current system [ ] Need to streamline processes and operations [ ]
   Need for system integration [ ] Need to share information [ ]
   Executive orders [ ] Others, please specify

7. Which are the target areas of information systems in your organization (you may tick more than one choice)? Interna! efficiency [ ] Externa! service delivery [ ]
Others, please specify

8. Who initiates information systems projects in your organization (you may tick more than one choice) Donors [ ] Functional departments [ ] IT department [ ]
Customer pressure [ ] Top management [ ] Government [ ]
Others, please specify

9. Which IS implementation method is preferred by your organization?
Plunge [ ] Parallel [ ] Phased [ ] Pilot [ ] Others, please specify

10. How is procurement of information systems done by organization(you may tick more than one choice) Off self [] customization [] In-house development [ ] Outsourcing [ ]
Others, please specify

11. In which of the following stages of information systems development does your organization experience challenges most (tick one)?
System Investigation [ ] System implementation [ ] System Analysis [ ]
System Maintenance [ ] System Design [ ] Others, please specify

12. Indicate by ticking in the appropriate boxes the degree to which you agree with each of the following statement as applicable to Information Systems Implementation in your organization *(where 5"=Strongly Agree, 4~ Agree 3-Neutral 2=Disagree l=Strongfy BiIs agree)*

	Attribute	5	4	3	2	1
a)	Information systems requirements are defined by users	[ ]	[ ]	[ ]	[ ]	[ ]
b)	Information Systems implementation scope is clearly defined	[ ]	[ ]	[ ]	[ ]	[ ]
c)	Information systems functionalities are developed based on user needs analysis.	[ ]	[ ]	[ ]	[ ]	[ ]
d)	There is a justification for every information system concept envisioned by the organization.	[ ]	[ ]	[ ]	[ ]	[ ]
e)	A detailed work plan is developed to guide information system implementation.	[ ]	[ ]	[ ]	[ ]	[ ]
f)	There is user acceptance and certification of information systems prior to implementation.	[ ]	[ ]	[ ]	[ ]	[ ]
8)	Systems requirements relate to identified need or opportunity.	[ ]	[ ]	[ ]	[ ]	[ ]
h)	Every module of information systems has detailed logic specifications.	[ ]	[ ]	[ ]	[ ]	[ ]
i)	Information systems are integrated in a systematic manner.	[ ]	[ ]	[ ]	[ ]	[ ]
j)	Installed information systems are monitored for continued performance.	[ ]	[ ]	[ ]	[ ]	[ ]
k)	Others, please specify	[ ]	[ ]	[ ]	[ ]	[ ]

13. During systems development and implementation which of the following practices is implemented by your organization?(tick one as applicable)

	Attribute	Yes	No
a)	Identification of essential desktop facilities including hi rare siicl sny software.	J	
b)	a checklist of all functionalities/modules developed	[ ]	
c)	version control	[I	
d)	Development of system documentations.	[ ]	
e)	Regular review of system documentations.	[1	
f)	Defining of user roles.	[ ]	
g)	Stress testing(testing for operational stability when operations are above norma!)	[ ]	
h)	Cut of dates are decided and communicated.	f1	
i)	Comprehensive Go live plan.	[1	
j)	Data clean up before migration to the new system	[ ]	
k)	Clear roles on how the information systems will be monitoring until it stabilizes	[ ]	
1)	Stakeholders are informed about the new information system.	[ ]	
m)	Development of a training plan and executing it.	[ ]	
n)	Go live structures are developed and communicated to stakeholders	[1	
o)	IT support frame work is created before information system is implemented.	[i	
p)	Service desk location is created and communicated to users.	[ ]	
q)	The Procedure for handling changes during go live is documented and communicated,	[j	
r)	Detailed risk log and risk alleviation procedures		
s)	Others, please specify	[i	

14. Please tick as appropriate the degree to which you agree with each of the following statements in regard to the practices of information system implementation in your organization .*(where 5—Strongly Agree, 4= Agree 3=Neuiral 2=I>isagree 1=Strongly Disagree)*

	Attribute	5	4	3	2	1
a)	Information system focuses on supporting departmental functions.	[ ]	[i	[i LJ	[ ]	[1
b)	Budget for information systems implementation is inadequate	[ ]	[ ]	[J	[ ]	[ ]
c)	Information system implementation lack appropriate policies.	[ ]	[i	[ ]	[J	[I
d)	Most information system projects are initially donor funded.	[ ]	[ ]	[J	[ ]	[ ]
e)	In some cases, donations for information system projects are made	[ ]	[i	[i	[1	[1

	Attribute	5	4	3	2	1
	without prior consultation					
f)	Donor funding on information system projects comes when the project has started.	[ ]	[ ]	[ ]	[ ]	[ ]
g)	Contract for consultants includes succession training and knowledge transfer systems.	[ ]	[ ]	[ ]	[]	[]
h)	There is an established software development unit in the organization.	[ ]	[ ]	[ ]	[ ]	[ ]
i)	There is an established IT department to spearhead information system implementation.	[ ]	[ ]	\ j	[ ]	[ ]
j)	There is established Quality Assurance unit to certify changes and system tests.	[ ]	[ ]	[ ]	[ ]	[ ]

Section C: Information Systems Implementation Challenges

15. For each of the following statement indicate the extent to which your organization face the challenge with respect to their information systems implementation, by ticking in the appropriate box. ***(Where 5—Very Large extent 4— Large extent 3~ Moderate extent 2=Smal 1-No extent***

	Attribute	5	4	3		1
a)	Inadequate cost benefits analysis.	[1	[1	[1	[	[I
b>	Lack of detailed installation plan	[ ]	[ ]	[ ]	[	[ ]
c)	Transfer of ICT champions.	[j	[i	[1	[	[^
d)	Incompatibility of Files formats	[3	[J	[ ]	[	[ ]
e)	Difficulty in Data conversion.	[ ]	[1	[1	[	[ ]
0	Lack of appropriate tools for quality assurance	[ ]	[ ]	I J	[	[1
g)	Inadequate system testing	[1	[I	[1	[	[i
h)	Inappropriate design environment and tools.	[ ]	[ ]	[ ]	[	[ ]
i)	Project managers lack project management skills.	[i	[1	[1	[	[ ]
j)	User of the information systems lack of the requisite skills.	[ ]	[ ]	1]	[	[ ]
k)	Resistance to change	[1	[1	[1	[	[i
1)	Lack of funds	[ ]	[1	[ ]	[	[ ]
m)	Scope creep (uncontrolled changes in a project's).	[i	[1	[ ]	[	[1
n)	Lack of consensus between senior managers	[ ]	[ ]	[ ]	[	[ ]
o)	Inadequate training.	[1	[1	[ ]	[	[ ]
P)	Insufficient software evaluation.	[ ]	1]	[ ]	[	[ ]
q)	Lack of expertise.	[1	[1	[1	[	[ ]
r)	Use of inappropriate changeover process.	[ ]	[ ]	[ ]	[	[ ]

Attribute

s) Poor planning and coordination,

t) Processes are not well defined,

u) Unrealistic project timelines,

v) Poor information systems interface,

w) Complying with too many rules,

x) Inadequate understanding of system capabilities,

y) Fear of customization,

z) Technical compatibility hardware/software

aa) Poor infrastructure/networks,

bb) Cost overruns,

cc) Inadequate communication,

dd) Corruption,

ee) High cost of licences,

ff) Slow procurement process,

gg) Inadequate software specifications,

hh) Inability to retain technical staff (turnover),

ii) Limited support from user departments,

jj) Lack of top management support,

kk) Information systems security issues.

ll) Bureaucracies in government projects.

mm Poor Leadership styles and attitude,

nn) Lack of **IT** standards,

oo) No suitable structure to support automation

Others, please specify

16. What steps can be taken to ensure a 'smooth' implementation of informa on system in state parastatals

17. In your opinion, how can information systems implementation challenges be reduced in state parastatals?

Thank you for filling this questionnaire.

Appendix 2: List of parastatal in Kenya

The population sample will be selected from the following 123 gazetted pursstatsl s, source: (http ://communi cati on .go.ke/ parastatals)

1. Agricultural Development Corporation
2. Agricultural Finance Corporation
3. Agro-Chemical & Food Company Ltd
4. Athi Water Services Board
5. Bomas of Kenya Ltd
6. Capital Markets Authority
7. Catering Tourism and Training Development Levy Trustees
8. Central Water Services Board
9. Chemili! Sugar Company Limited
10. Coast Development Authority
11. Coast Water Services Board
12. Coffee Board Of Kenya
13. Coffee Research Foundation
14. Commission for Higher Education
15. Communication Commission of Kenya
16. Consolidated Bank of Kenya
17. Cooperative College of Kenya
18. Council tor Legal Hducation
19. Deposit Protection Fund Board
20. East African Portland Cement Co.
21. Hgerton University
22. Ewaso Ng'iro South Development Authority
23. Export Processing Zone Authority
24. Export Promotion Council »
25. Gilgil Telecommunications industries
26. Higher Education Loans Board
27. Horticultural Crops Development Authority
28. Industrial and Commercial Development Corporation
29. Industrial Development Bank
30. Investment Promotion Centre
31. Jorno Kenyatta University of Agriculture and Technology
32. KASNEB
33. Kenya Agricultural Research Institute
34. Kenya Airports Authority
35. Kenya Anti-Corruption Commission
36. Kenya Broadcasting Corporation
37. Kenya Bureau of Standards (KEBS)
38. Kenya Civil Aviation Authority
39. Kenya College of Communication & Technology
40. Kenya College of Communications Technology

41. Kenya Dairy Board
42. Kenya Electricity Generating Company
43. Kenya Kerry Services Limited
44. Kenya Forestry Research Institute
45. Kenya Industrial Estates
46. Kenya Industrial Property Institute
47. Kenya Industrial Research & Development Institute
48. Kenya Institute Of Administration
49. Kenya Institute of Public Policy Research and Analysis
50. Kenya Literature Bureau
51. Kenya Marine & Fisheries Research Institute
52. Kenya Maritime Authority
53. Kenya Meat Commission
54. Kenya National Assurance Company
55. Kenya National Examination Council
56. Kenya National Library Service
57. Kenya National Shipping Line
58. Kenya National Trading Corporation Limited
59. Kenya Ordinance Factories Corporation
60. Kenya Pipeline Company Ltd
61. Kenya Plant Health Inspectorate Services
62. Kenya Ports Authority
63. Kenya Post Office Savings Bank
64. Kenya Power and lightening company
65. Kenya Railways Corporation
66. Kenya Re-insurance Corporation
67. Kenya Revenue Authority
68. Kenya Roads Board
69. Kenya Safari Lodges & Hotels
70. Kenya Seed Company Ltd
71. Kenya Sisal Board
72. Kenya Sugar Board
73. Kenya Sugar Research Foundation
74. Kenya Tourist Board
75. Kenya Tourist Development Corporation
76. Kenya Utalii College
77. Kenya Water Institute
78. Kenya Wildlife Service
79. Kenya Wine Agencies Limited
80. Kenyatta International Conference Centre
81. Kenyatta University
82. Kerio Valley Development Authority
83. Lake Basin Development Authority
84. Lake Victoria South Water Service Board
85. Local Authority Provident Fund

86. Maseno university
87. Moi University
88. National Aids Control Council
89. National Bank of Kenya
90. National Cereals and Produce Board
91. Nations] Council for Law Reporting
92. National Environmental Management Authority
93. National Hospital Insurance Fund
94. National Housing Corporation
95. National Irrigation Board
96. National Museums of Kenya
97. National Oil Corporation of Kenya Ltd
98. National Social Security Fund(NSSF)
99. National Water Conservation and Pipeline Corporation
100. Natonal Co-ordinating Agency for Population and Development
101. NewK.C.C
102. NGO's Co-ordination Bureau
103. Numerical Machining Complex
104. Nyayo lea Zones Development Corporation
105. Nzoia Sugar Company
106. Pest Control Products Board
107. Postal Corporation of Kenya
108. Prethrum Board of Kenya
109. Retirement Benefits Authority
110. Kill Valley Water Services Board
111. School Equipment Production Unit
112. South Nyanza Sugar Company
113. Sports Stadia Management Board
114. Tana and Athi Rivers Development Authority
115. Tea Board Of Kenya
116. Tea Research Fountation Of Kenya
117. Teachers Service Commission
118. Telkom (k)Ltd
119. University of Nairobi
120. University of Nairobi Enterprises & Services Ltd
121. Water Resources Management Authority
122. Water Services Regulatory Board
123 Western University College of Science and Technology

Appendix 3: University Letter

UNIVERSHY OF NAIROBI

SCHOOL OF BUSINESS

^BA PROGRAM - LOWER KABETE CAMPUS

Telephone: *020-2059* I 62
Telegrams: "Varsity", Nnimhi
I elex: 22095 Vsnsilv

P.O. Bon 30197
Nairobi, Kenya

DATE... 3.9../ ° Cf J

TO WHOM IT MAY CONCERN

The bearer of this letter. . . . .C I<fA ;S AH v Jh o.Pr^f&A

Registration No:. . . . . .0 &:.{ I P | I PS

is a Master of Business Administration (MBA) student of the University of Nairobi.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their piojects on real problems affecting firms in Kenya. We would, therefore, appreciate if you assist him/her by allowing him/her to collect data in your organization for the research.

I'he results of the report will be used solely for academic purposes and a copy of the same will bo availed to the interviewed organizations on request.

Than£y?u- UM!VFRS:TYGF NAIROBI
, SRMOO- OF BUSINESS
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.DR. W.N. IRAKI :•«A1RO01
CO-ORDINATOR, MBA PROGRAM

Appendix 4: Total Variance Explained- Challenges of ISs Implementation

Total Variance Explained									
	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative%
1.0	16.6	40.5	40.5	16.6	40.5	40.5	5.5	13.3	13.3
2.0	3.0	7.2	47.7	3.0	7.2	47.7	4.8	11.6	24.9
3.0	2.4	5.8	53.6	2.4	5.8	53.6	4.4	10.7	35.6
4.0	2.3	5.5	59.1	2.3	5.5	59.1	3.0	7.3	43.0
5.0	1.9	4.6	63.6	1.9	4.6	63.6	2.9	7.0	50.0
6.0	1.7	4.1	67.7	1.7	4.1	67.7	2.8	6.8	56.8
7.0	1.4	3.5	71.2	1.4	3.5	71.2	2.5	6.1	62.8
8.0	1.3	3.2	74.3	1.3	3.2	74.3	2.3	5.5	68.3
9.0	1.3	3.1	77.4	1.3	3.1	77.4	2.2	5.4	73.8
10.0	1.1	2.8	80.2	1.1	2.8	80.2	2.2	5.3	79.1
11.0	1.0	2.5	82.7	1.0	2.5	82.7	1.5	3.6	82.7
12.0	1.0	2.4	85.0						
13.0	0.9	2.1	87.2						
14.0	0.7	1.8	89.0						
15.0	0.6	1.5	90.5						
16.0	0.5	1.3	91.8						
17.0	0.5	1.2	93.0						
18.0	0.4	1.0	94.0						
19.0	0.4	0.9	95.0						
20.0	0.3	0.8	95.7						
21.0	0.3	0.7	96.5						
22.0	0.3	0.6	97.1						
23.0	0.2	0.5	97.6						
24.0	0.2	0.4	98.0						
25.0	0.1	0.3	98.4						

26.0	0.1	0.3	98.7						
27.0	0.1	0.3	99.0						
28.0	0.1	0.2	99.2						
29.0	0.1	0.2	99.4						
30.0	0.1	0.2	99.6						
31.0	0.1	0.2	99.8						
32.0	0.0	0.1	99.8						
33.0	0.0	0.1	99.9						
34.0	0.0	0.0	99.9						
35.0	0.0	0.0	100.0						
36.0	0.0	0.0	100.0						
37.0	0.0	0.0	100.0						
38.0	0.0	0.0	100.0						
39.0	(0.0)	(0.0)	100.0						
40.0	(0.0)	(0.0)	100.0						
41.0	(0.0)	(0.0)	100.0						

Extraction Method: Principal Component Analysis.

Source: Research data (2009)

Appendix 5: Rotated Component Matrix- Challenges of ISs Implementation

Factor	Component										
	1	2	3	4	5	6	7	8	9	10	11
Processes are not well defined	845	.085	.013	.014	.153	-.014	-.129	.057	.147	.117	.144
Poor planning and coordination	743	.336	.163	.124	.057	.133	.150	.117	.194	.025	.053
Use of in appropriate changeover process	713	.145	.379	.174	.145	.211	-.155	.032	.146	.158	-.051
Limited support from user departments.	676	.042	.290	•8.995E-05	.099	.068	.179	.510	.129	.007	.033
Lack of top management support.	664	.241	-.028	.062	.188	.351	.353	.055	.025	.117	.108
No suitable structure to support automation	639	.068	.086	.149	.206	.219	.459	.207	-.084	.126	.052
Poor leadership styles and attitude.	505	.222	.265	.149	.088	.419	.355	-.018	.141	.323	-.148
Lack of IT standards	444	.341	.343	.172	.429	.265	.227	.084	.053	.001	-.207
Slow Procurement process	.263	790	.128	.097	.191	.035	.021	-.103	.163	.035	.227
Complying with too many rules	.251	762	.124	.101	.245	.093	.111	.179	-.079	-.084	.028
Transfer of ICT champions	-.117	673	.027	.358	.087	.013	-.138	.355	-.056	.303	.021
Inadequate understanding of system capabilities	.346	667	.322	-.102	.066	-.006	.163	.075	.233	.079	.131
Fear of customization	.134	568	.031	-.079	.338	.073	.258	.209	.482	.030	-.227
Lack of funds	.031	546	.416	.147	-.011	.021	.290	.187	.025	.077	.202
Inadequate communication	.306	514	.347	-.060	.084	.470	.087	.033	.423	.010	-.030
Cost overruns	.069	427	.372	.063	.275	.420	.188	.319	.261	-.134	.086
Scope creep (uncontrolled changes in a project's)	.200	.164	794	.031	.068	.011	.124	.188	.038	.153	.162
Inadequate training	.099	.046	773	.053	.291	.189	.222	.022	.007	.360	.007
Lack of consensus between senior managers	.014	.327	745	-.069	.263	.054	.033	.048	.083	.236	.152
poor information systems interface	.377	.100	S04	.232	.081	.144	.042	.279	.093	.074	.292
Project Managers lack project management skills	.357	.396	143	.437	.070	.273	.124	.058	.151	.147	.136
Incompatibility of files formats	.059	096	-042	.874	086	-044	.132	026	094	.195	.025

Difficulty in Data conversion	.109	.026	.164	.803	.143	.352	-.003	-.003	.108	-.096	.118
Lack of detailed installation plan	.357	.364	.002	.450	.104	.154	.105	.039	.082	.444	.273
User of the information systems lack of the requisite skills	.287	.239	.061	.149	**828**	.005	.213	.047	-.004	.124	.123
Resistance to change	.166	.268	.291	.235	**620**	.253	-.024	.178	.153	-.010	.136
High cost of licences	.394	.151	.495	.022	**529**	-.064	.354	.135	.022	.005	-.001
Information System security issues.	.272	.320	.170	.344	**402**	.077	.281	.244	.037	.297	-.293
Lack of appropriate tools for quality assurance	.186	-.196	.122	.318	-.163	**737**	.111	.108	-.205	.088	.134
Bureaucracies in Government projects.	.268	.358	.035	-.013	.250	**695**	-.124	-.101	-.182	.212	.056
Inappropriate Design environment and tools	.132	.023	.198	.252	.340	**478**	.040	.290	.217	.385	-.027
Corruption	.047	.123	.196	.095	.209	-.017	**807**	.110	.149	.130	.054
Inability to retain technical staff (turnover).	.248	.219	.212	-.031	.071	.006	.261	**744**	.021	.169	.019
Unrealistic project timelines	.441	.144	.253	.256	.265	.125	-.090	**473**	-.156	-.058	-.181
Inadequate system testing	.164	.153	-.085	.408	.128	.417	-.243	**456**	.191	.096	.221
Poor infrastructure/network	.058	.302	.216	-.054	.393	.046	.387	**451**	.364	.144	.217
Technical compatibility hardware/software	.184	.061	.033	.221	.029	.137	.059	.004	**891**	.083	.069
Inadequate software specifications	•41?	.288	.222	.120	.008	.067	.495	.082	**541**	.036	.064
insufficient software evaluation	.117	.023	.402	.034	.012	.193	.106	.098	.100	**808**	.072
Lack of expertise	.296	.063	.406	.376	.122	.037	.175	.112	.019	**583**	.081
Inadequate cost benefits analysis	.128	.234	.127	.133	.110	.117	.086	.041	.050	.097	**810**

Source: Research data (2009)

Appendix 6: Component Transformation Matrix

Component	I	2	3	4	5	6	7	8	9	10	11
1	.478	.424	.404	.244	.310	.261	.243	.242	.191	.212	.077
2	.185	-.417	-.140	.576	-.119	.460	-.278	-.032	-.289	.213	.088
3	.064	.500	-.676	.255	.085	.045	-.219	-.018	.221	-.311	.142
4	-.790	.302	.214	.372	.072	-.002	-.082	.042	-.029	.268	.116
5	.008	-.333	-.200	.380	-.132	-.389	.454	.018	.523	.215	.099
6	.102	.153	.282	-.119	-.644	.090	-.293	-.257	.356	.055	.409
7	.033	-.141	.149	.093	-.077	-.300	-.229	.747	-.104	-.327	.353
8	.134	.196	-.220	-.125	-.046	-.245	.282	-.115	-.550	.340	.553
9	-.279	-.132	-.181	-.283	-.073	.639	.436	.262	.124	-.134	.293
10	-.033	-.217	.265	.158	.433	-.024	.069	-.477	.018	-.494	.439
11	-.011	-.220	-.144	-.343	.494	-.002	-.435	.069	.317	.456	.258

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Source: Research data (2009)