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Cultural influences in software development: A study of a Kenyan company

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Abstract

Research and development on information systems development was first carried out in countries with different cultural affiliations from that in Kenya. However, these methodologies assume the cultural influences of the country of origin and therefore may not be suitable in countries with a different cultural setting. This research therefore uses Hofstede's 5 dimension model to study the culture of the Kenyan people with an aim of finding a suitable information system development approach that would be suitable in their cultural set up.

Preface

Continuous improvements and modifications to information system development have been carried out over the years in order to get an approach that is fit for the purpose. One of the significant factors that make the approaches suitable in one environment and not in another is due to the differences in cultural settings. Culture being an integral part of society influences people's approach to work. This is influenced by their philosophies to life, historical background, socio-economic and environmental factors among others. Therefore when adapting systems in diverse cultural set ups, it is useful to study the cultural set up first.

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Maureen Adhiambo Odipo

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

TABLE OF FIGURES

TABLE OF TABLES

Chapter 1: Introduction

Background

Due to the globalisation of world economies, countries all over the world are forced to look beyond their own culture in order to fit well and compete effectively (Ford, 2003). Information systems development (ISD) has been carried out in industrialized countries and the methods used to develop these systems have been adapted in developing countries but with mixed results (Ojo, 1992). This problem has been aggravated in developing countries by inadequate research support from their governments and the relative foreignness of the technology (Odedra, 1992). It has been noted that adapting systems from one country to another is not only about exporting hardware and software but also understanding the culture of the countries (Mursu, 2000). Peoples behaviour is deeply rooted in a given context and is connected to their values and beliefs, therefore if it is ignored it can result in problems such as:

> *"Inability to retain and motivate employees, misreading the potential of cross-border alliances, marketing and advertising blunders, and failure to build sustainable sources of competitive advantage. Mismanaging cultural differences can render otherwise successful managers and organisations ineffective and frustrated when working across cultures." (Pheng 2002, Hoecklin, 1996).*

The study does not however look at the culture of the country, that is national culture, but focuses on the culture in a smaller setting that is a locally based company. Culture is vague, and difficult to isolate and measure; therefore there will be need to identify a model which has been used in this kind of study and adopt it for these purposes.

Accordingly this paper is organized around the following issues:

(1) Model that will be used to study culture in the company

(2) Effects of culture on ISD.

Research motivation

This research has been motivated by my previous research on ISD in developing countries (Odipo, 2003). In this research I found out that developing countries have special ISD needs brought about by their unique characteristics. Some of these characteristics include poor economies whilst others were a result of the culture. It was however relatively easy to study those brought about by the economic situation and subsequently recommend solutions such as provision of cheaper solutions. On the other hand the cultural aspects needed a more in depth study because of their abstract nature. It was not easy to quantify culture into categories hence necessitating more research on how to classify culture into variables that can be studied with an aim of providing recommendations/solutions for ISD in developing countries. Nevertheless, this paper does not study developing countries per se, but focuses on a company in a developing country, that is Kenya, with an aim of determining the culture of its ISD team. This research has also been motivated by researchers who argue that;

> *Information system development teams from different cultures will differ in their values and attitudes affecting the way they develop their information systems (Walsham, 2002)..*

Hofstede has developed this argument further in his studies on national culture (1980, 1991). These characteristics are classified into 5 dimensions discussed at a later chapter. Myers (2002) studies on culture show that an understanding of culture and its impact is important for 'successful IT deployment in a global setting'.

Research Question

The aim of this study is to find out the cultural influences in software development in a locally owned software development company in a developing country, that is Kenya. The research tries to answer the question

How do Cultural influences affect software development in a Kenyan company?

In order to answer the above central research question the research is broken down into a set of immediate objectives:

- To define culture and the models used when studying culture
- To explore the effects of culture on ISD

Definition of terms

Culture

The definition of culture that is most appropriate for this study is by Schein (1984):

> *A pattern of basic assumptions invented or discovered by a given group, that has been developed to cope with its problems of external adaptation and internal integration. It should have worked well enough to be considered valid, and, therefore taught to new members as the correct way to perceive, think and feel in relation to those problems (Schein 1984)*

Hofstede (1980) defines culture as:

> *Collective programming of the mind which distinguishes one group of people from another and he defines 'national culture' as a unique culture that is made up of values, assumptions, expectations, perceptions and behaviour. (Hofstede, 1980).*

Culture is associated with a group of people who then pass it on to new members. In this research a group consists of information system developers and the patterns for external adaptation and internal integration are the activities that are carried out during ISD.

Information system development (ISD)

An information system includes information processing activities, which do not necessarily involve modern information technology (Laudon, 1995). However for the purposes of this research we assume that an information system consists of modern information technology, that is, a software product is the end result. Information system development can thus be defined as the processes that are involved in building a computerised system. An information system development methodology is a collection of procedures, techniques, tools and documentation aids which help the system developers in their efforts to implement a new information system (Avison, 1995).

Research strategy

Literature review

A study of culture, information system development and models used to study culture was carried out with a particular focus on the effects of culture in organisations. The potential contribution of this review was to get a better understanding of how culture can affect the work patterns in an organisation and whether it has an effect on the results of production. The study also aimed at finding out the methods that have been used to study culture because Shore (1995) affirms that culture is vague, difficult to isolate, and difficult to measure. The literature review also served as a basis of finding a suitable data collection methodology.

Thesis organisation

The first chapter is an introduction to the research area, the research strategy, key concepts and the research question. The second chapter describes the processes used in data collection and the justification of the selected method. It also describes the research design, rationale for the research and the interview questions. The interview is explored in detail giving the plan and the source of the interview questions. The third chapter explores culture and methods of classifying culture using Hofstede's 5 Dimensional model. Details of the dimensions and their usefulness in the study are explained. The chapter also looks at how other researchers have used Hofstede's model in their research and the critics of his approach in the study of culture. The fourth chapter illustrates the results of the interview in a case study format. The chapter starts by giving a description of the company under study and then briefly talks about the client company in which the software development takes place. Chapter five is a discussion of the findings from the case study followed by conclusions and recommendation in the subsequent chapter.

Chapter 2: Methodology

Chapter summary:

This chapter begins with an introduction which describes methodologies that have been used in similar researches then it describes the rationale for the research and the research design for this project. The rationale of the research describes the importance of this research to ISD and the research design gives a brief description of how the research was carried out. The data collection strategy is then discussed giving the interview plan and a description of the interview subjects. The sample population is a local company in a developing country, Kenya.

2.1 Introduction

The activities that researchers do in order to produce research results which contribute to the body of knowledge, is known as the research process. (Nachmias,1996). In the current research process a case study approach is adapted in the exploration of culture in ISD in a company located in a developing country. Many of the approaches to date have followed Hofstede's pioneering work using a survey style of research (Hsu, 2002). Some researchers have attempted to refine surveys by focusing on the questionnaire and ensuring that the questions are relevant for the research purposes (Spectre, 1994). Others have suggested that there is a need to complement questionnaires with fieldwork with different researchers involved in specific cases (Galang 1999). Hsu (2002) argues that the case study approach has the potential to draw out and to facilitate an understanding on the part of respondents. Using the case study approach he posed questions to the interviewees to encourage them to look at issues in a way they may not have done if he had not been present nor had the interviews. The case study approach is preferred for this study because this research does not seek to find relationships between variables that are isolated but to have a deeper understanding of one subject area.

2.2 Research design

The research design is about how the elements of the research fit together. It consists of the elements the researcher will use in collecting, analysing and interpreting the findings from the research (Nachmias, 1996). The research begins with a study of culture and a common model that is used to study culture. The model is analysed in depth and a critique on its usefulness is given. The study of culture helps us to appreciate the complexity of studying culture and also it provides us with a model that can be used in this study. The questionnaire used in the case study is developed using

guidelines that have been set by other researchers in the field. The findings are then represented for analysis in a tabular format. A tabular format is selected because it makes it easier to break down the results into more meaningful bits. After analysis of the findings there is a discussion on the same and recommendations as to a suitable approach are given. In figure 2.1 a summary of the results is shown.

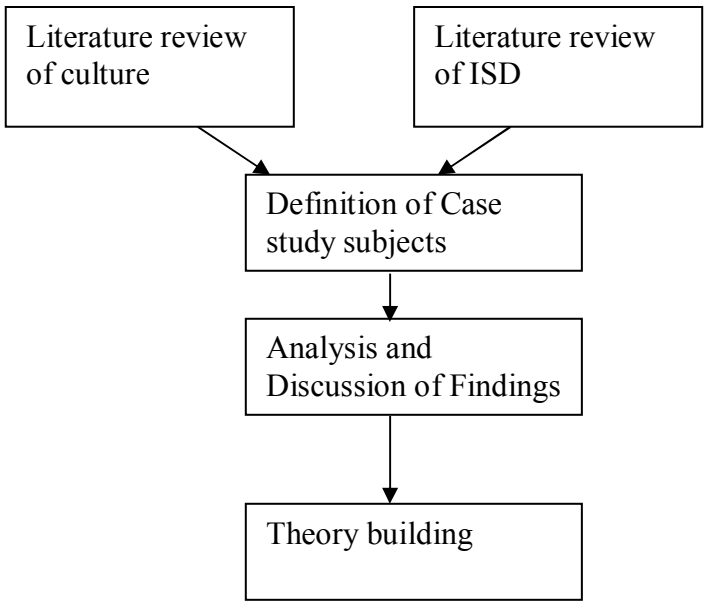

Figure 2.1 Research design

2.3 Rational for research

It has been noted that adapting systems from one country to another is not only about exporting hardware and software but also understanding the culture of the countries (Mursu, 2000). Studying culture helps in understanding why people in a region do things the way they do and from this understanding it is possible to develop methodologies that are suitable for their use. People's behaviour is deeply rooted in a given context and is connected to their values and beliefs (Pheng 2002, Hoecklin, 1996). Therefore the focus of this study will be to investigate the cultural influences

in ISD in a locally owned software development company in a developing country, that is Kenya. This survey is also geared towards the completion of a Masters thesis.

2.4 Data collection strategy

The choice of method for the survey is the informal interview because of the relative simplicity of this method in data collection and also because the survey is collecting qualitative data. It is also fairly accurate given that the results reflect the current situation. Another reason for using interviews is the ability to collect nonverbal cues which can be used to gain extra information for example nervousness can be a sign that the interviewee fears saying something which may jeopardise his future opportunities in the company.

2.4.1 Planning the interview

A request for an interview is sent to the company and a date and time fixed. A confirmation is done by phone a day before the meeting. The interviews will be carried out away from the work environment in order to reduce distractions for example from telephone calls and also for the "comfort of the interviewee. If the interviewee does not feel under pressure he is more likely to answer the questions satisfactorily. The interview begins with a casual chat in order to put the interviewee at ease, during this time the purpose of the interview is explained and any questions are answered. When the interviewee is relaxed, the objectives of the interview are explained and an outline of what will happen next. The interview starts with 'context' questions; these are high level questions which generally require the interviewee to answer in general terms for example:

> *" Can you describe your experience as a programmer, what goes on during a normal working day"?*

After the context questions, 'detailed' questions are asked on the issues that came up during the context question session. The detailed questions are also used to steer the conversations towards the topic the interviewer is interested in, for example,

> *'You mentioned that you work in a project team. How many members are there and how is the work distributed between you?"*

At the end of the interview, a summary of the points discussed is reviewed to check the facts, the next meeting is scheduled and a vote of thanks is given for the interviewee's time. A summary of the interview steps is shown in figure 2.2.

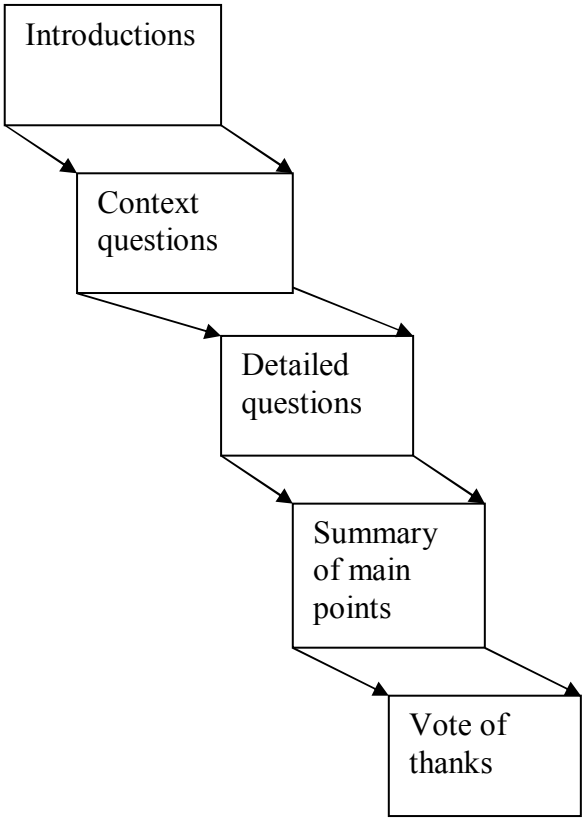

Figure 2.2 Interview steps

2.4.3 Interview subjects

The population for the research consisted of members of staff. Subordinate staff were used for questions concerning power distance because they are better judges of power

distance than their superiors (Hofstede, 1980). Questions on the other dimensions were distributed between the subordinates and superiors.

2.6 Conclusion

In this chapter we have seen that various researchers have explored this area of culture in ISD with different approaches. This research chose the case study approach as the most suitable one because of the advantages it has compared to other approaches. The rationale of the research is the effects of culture on ISD.

Chapter 3:Culture

Chapter summary:

This chapter begins with a brief discussion of Charles Handy and Roger Harrison's model because it is one of the approaches used in studying organisation culture. Hofstede's model is found to be the more suitable one for the purposes of this study because it addresses a wider range of issues. Hofstede's model is thus discussed in detail by defining the meaning of the dimension of culture, their applications and how these dimensions have been used in previous research. Finally a criticism on this model is given so that the reader is aware of its shortcomings and how they will affect this research.

3.1 Introduction

ISD methodologies were originated to improve the structure, management and control of the software development process and to standardize the development process and product by specifying activities to be done and their relationships. (Wynekoop, 1995, Avison, 1995). However these methodologies assume the cultural influences of the country of origin and therefore may not be suitable in countries with a different cultural setting.

> *Indeed, studies undertaken in many different corners of the globe have concluded that IS issues do differ among countries. One approach to understanding this new level of complexity is to introduce culture as a variable in the systems development process (Shore, 1994).*

3.2 Studying culture

A common way of studying culture is based on the work of Charles Handy and Roger Harrison. They study organisations using the degree of formality and centralisation in the way things are done. In 'Autocratic power culture' people rely on those with authority for approval and for decision making. It is commonly found in sole proprietor business. In this type of culture, a project manager should be aware that no significant projects can be approved until they have been authorised by the management. Another type of organisational culture is, 'Bureaucratic role culture' where everyone has a well defined role, job description and formal relations with other members. This is a commonly found in public sector organisations. For a project manager to get information in bureaucratic organisations he should be aware that there is usually a parallel informal set of relationships which are used to get round the system but when dealing with money the formal systems should be complied with. A third type of organisational culture is 'matrix task based culture' the work is divided

into tasks that are carried out in taskforces and problem solving teams. Task based cultures are the easiest to run a project because they have a lot of similarity with project management. The similarities include: devolution of tasks and activities such as planning and control. It also fosters team responsibility which is important for project management. The fourth type of organisational culture is 'Anarchic individualistic culture', which is informal and made up of people in the same profession. There is no central source of power because; in this culture everyone has a distinct voice and everyone's opinion matters. They consider themselves a family. In this situation a project manager needs to win respect as a fellow professional. (Yeates et al 1996). From the examples of Charles Handy and Roger Harrison power manifests itself as an important concept that has to be considered for successful transfer of technology for example in autocratic power culture documents will not get signed unless the person with the 'power' approves and in bureaucratic type of organisations, the source of power is in the informal parallel systems. In task based cultures the project team has a project manager as the source of power and in Anarchic culture the source of power lies at an individual level and for a project manager to be convincing he has to have the power to convince the clients that he is also a professional.

Critiques on this approach

This method of studying culture however is not adequate for this study because it only focuses on one aspect, power. In order to effectively study the culture of ISD developers in a Kenyan company the focus will be on Hofstede's 5 Dimensional model. Two thirds of the studies on culture and software development have been carried out using Hofstede's 5 D model (Myers, 2002). Hofstede ideas on culture were first based on a large research project on national culture differences across

subsidiaries of a multinational corporation (IBM) in 64 countries. Further studies covered students in 23 countries, elites in 19 countries, commercial airline pilots in 23 countries, up-market consumers in 15 countries and civil service managers in 14 countries (Hofstede, 2003). From these studies he was able to identify and validate five independent dimensions of national culture differences. By dimensions, Hofstede means the ability to define how a culture's patterns of behaviour solve a given problem and how this behaviour is compared with that of other cultures (Naumov, 2000).

3.3 Hofstede's 5 dimensional model

This section discusses Hofstede's 5 dimensional model and explores the influence of culture in an organisation.

> *While Hofstede has a good spread of national cultures in his dimensions, there occur in all these dimensions both successful and unsuccessful economies. No positioning reveals that it is better to be in one place than another. High power distance culture like Japan can succeed as low power distance cultures like the USA. 'Feminine' Scandinavia creates wealth, as does Masculine Japan. (Hampden-Turner, 1997).*

- Power distance - The degree of inequality of power distribution between the powerful members of society such as the senior members of staff (project managers) and the less powerful members of staff (Hofstede, 1980). Hofstede states that both the senior and junior members of an organisation accept the level of inequality in a society as the norm. The degrees of inequality differ from country to country with some being greater. In cultures that have high power distance superiors make decisions without consulting the subordinates and these subordinates are fearful of disagreeing with their superiors whereas cultures that

are low in power distance tend have a more participative and egalitarian relationship between the senior and junior members of staff (Ford, 2003). Projects may be successful or otherwise depending on how they are managed.

- Individualism versus collectivism - the extent to which members of the group are willing to act as a unit (Hofstede, 1980). It can also be described as the cohesiveness of group members (project team). Group loyalty is seen as being very important. Individuals in collectivist societies will have less satisfaction for meetings that are geographically dispersed where non-verbal communication cannot be shared (Ford, 2003, Dustabar 1999). However in individualist societies the ties between individuals are loose with an emphasis on looking after oneself (Hofstede, 1980). Individualism has also been defined as the degree to which people have freedom to adapt their own approach to their job. In this culture personal goals take priority even when they conflict with the goals of the group (Oudenhoven, 2001)

- Masculinity versus femininity – The level of importance given to masculine as opposed to feminine roles (Hofstede, 1980). Masculinity is a socially constructed role and thus changes over both time and space. 'Technology that is strongly associated with women is not really considered as 'technology'' for example, word processing is considered more feminine as opposed to hardware maintenance which is seen as more masculine (Wit, 1999). However, according to Ford (2003) masculinity /femininity is the most misunderstood of Hofstede's 5D model. It has been defined in terms of social gender roles where highly masculine cultures have very distinct gender roles and men are seen as being assertive, tough and focussed on material success; women are seen as being modest, tender and

concerned with quality of life. Ford suggests that this dimension should be seen in terms of masculine and feminine 'cultures' and not 'roles', that is, in terms of competitiveness and material success for masculinity and nurturance and quality of life for femininity.

> *"In masculine countries the stress is on pay security and job content; feminine countries stress on relationships and physical conditions" (Ford 2003). The desire to produce results, complete projects, generate exhaustive accounts and control projects and materials of realities (e.g. technology) are characteristics of masculinity as opposed to social and symbolic (abstract) characteristics. Murray (1993).*

Aspects such as competitiveness and material success define a highly masculine society whereas nurturance and quality of life are feminine. If the organisation is "people centred", that is, it is more concerned about the well being of the staff and their welfare as opposed to the work output it would be considered to have a strong affiliation towards femininity.

- Uncertainty avoidance – This is the tolerance for uncertainty and ambiguity. The cultures that avoid uncertainty are those that minimize the possibility of 'surprises' by using rules and laws, safety and security measures (Hofstede, 1980). "Uncertainty avoidance is related to anxiety, need for security and dependence upon experts" (Ford, 2003, Hofstede, 1980). In countries that have higher uncertainty avoidance the top management's role in implementation is decreased and employees responsibilities increased; they may experience higher resistance to applications, higher traditionalism and less long term goals for IS. This countries also have a fetish for detailed plans (Ford, 2003).

- Long term versus short-term orientation – From the studies carried out by Hofstede, long term orientation deals with values associated with prudence and perseverance, on the other hand values associated with short term orientation include fulfilling social obligations and protecting one's 'face' (Hofstede, 1988). Countries with short term orientation are more focussed on short and intermediate term goals.

3.4 IS uses of Hofstede's dimensions

> *By far the majority of studies concerned with various cultural aspects of development, implementation, use and management of IT have relied on Hofstede's model of national culture (Myers, 2002).*

Hofstede's research results have been used for various IS topics. Myers (2002) conducted a research and compiled a list of studies that have used Hofstede's research. Of the list 24 out of 36 were in IS. The topics in IS include how organisations are influenced by the introduction of information systems (Burn, Saxena, Ma, & Chenun, 1993), (Watson & Bracheau, 1991), (Watson, Kelly, Galliers & Brancheau, 1997), (Cummings & Guynes, 1994), (Martinsons & Westwood, 1997), (Png, Tan, & Wee, 2001). Management styles change with the introduction of information systems. Information systems allow for less delegation of tasks since the information can be processed using decision support systems, enabling management to have more control of what is going on and thus less need for middle managers. Issues such as feminine roles versus masculine roles become less obvious since the 'more' masculine roles have been simplified and have become feminine.

Some authors study information systems from a national perspective using Hofstede's dimensions. Different countries have different cultural affiliations; for example the

way the Chinese conduct business may be different from the way the Danes conduct business therefore when introducing information systems in these countries there is a need to consider their culture. Examples of conflicts in information systems development and implementation as a result of different national cultures that have been studied include those brought about by differences in the levels of uncertainty avoidance and power distance (Tan, Wei, Watson, Clapper & Mclean, 1998), (Tan, Wei, Watson, Walczuch 1998), (Walcczuch, Singh & Palmer 1995), (Hasan &Beck, 1999)(Harvey, 1997), (Hofstede, 2000), (Keil, Mixon, Saarinen & Tuunainen, 1994/1995), (Niederman, 1997), (Shore & Venkatachalam, 1994), (Straub, 1994), (Tan et al , 1995).

3.5 Other uses of Hofstede's dimensions

Hofstede's classification has been used in many fields. His book has been cited nearly 1700 times in the Social Science Citation Index (SSCI) and the majority of citations have been within general and international management. Several citations have also been within organizational behaviour and marketing. Psychology and sociology have used his work to further their research (Ford, 2003). For example, studies by Pheng (2002) and Naumov (2000).

3.6 Criticism of Hofstede's model

However, Hofstede's model has been found to be questionable. Myers (2002) suggests that the concept of national culture which assumes that the cultural differences are aligned to geographical boundaries is problematic because it ignores the fact that ethnic and cultural groups can exist in many nations. He also argues that Hofstede ignores the fact that subcultures can exist in a country. Another researcher Hampden-Turner (1997) claims that Hofstede's work uses Aristotelian categories of A and non-A, for example if one is individualist he cannot be collectivist that is, the

categories are mutually exclusive and exhaustive. He goes on to suggest that culture cannot be expressed in mathematical language because no one element in the context dictates meaning to the whole and also we cannot measure culture in terms of independent variables;

> *"Since cultures consist of interdependent, self-organizing values by definition, no truly independent variable exists" (Hampden-Turner, 1997).*

However in this research, Hofstede methodology has been selected despite the criticism on the validity and generalizability of his results. This is because the articles published in the leading journals are proof of its usefulness in theory development and testing and can support its contributions. In addition, a citation analysis shows that Hofstede's work has one of the most significant impacts, of all research in the field of international business studies (Ford, 2003, Myers, 2002). In this research, culture is not divided into Aristotelian categories of A and non-A but descriptive words such as "highly individualistic" are used to show the degree of individuality in the company. Other researchers have used scales of 1 – 10 with a score of 7 and above depicting a highly individualistic culture and a score of less than 5 being a collective culture. In the context of this research we assume that culture is defined by the behaviour of majority of the people.

3.7 Conclusion

From the findings in the chapter it can be seen that other researchers have tried to classify culture but Hofstede's classification was most appropriate for this work. Hofstede classified culture into five dimensions which include; Power distance, Individualism versus collectivism, Masculinity versus femininity, Uncertainty avoidance and Long term versus short-term orientation. Despite the criticism on

Hofstede's model, this model has been widely used in the study of information systems. His dimensions have also been used in other subject areas such as management, psychology and the social sciences.

Chapter 4: Case Description

Chapter summary

In this chapter, the necessary empirical data for a study of the company's culture is given in the form of a case study. The chapter starts by giving a description of the company under study and then talks about the client company in which the software development takes place

4.1 Background

Culture has been found to have an influence on information system development to the extent that projects have been known to fail because the cultural elements were ignored. From the definitions of culture in the first chapter it is obvious that culture influences the way we perceive the world around us and thus it directly, or indirectly, influences the way we carry out our work activities. From the studies carried out by Hofstede we can conclude that nations exhibit different cultural affiliations. In this case study, we seek to find out how a company situated in a developing country develops software from the requisition to the implementation stage.

4.2 Case outline

In the first section of the case study a brief history of the company is given and a general description of its operations. In the next section a description of the client company is given and its information system needs. Then the software development stages are described in detail.

4.3 Company description

The case concerns a Kenyan software engineering company, called LocalSoft*, which is a sole proprietor type of company but registered as a limited liability company. LocalSoft was incorporated in 1999 with five employees and now has a workforce of over 20 employees some of who are graduates form the national university. It is located in the capital city, Nairobi, which is the heart of trade and commerce in the country. As a service industry, the IT industry in Kenya has been limited to providing for the needs of big and small business in Kenya. The big companies in Kenya, with the exception of the Telecommunication operators, the Utility companies and the

* Name has been changed to protect the company's identity.

large government parastatals, such as the Kenya Ports Authority, would be comparable to small to medium sized corporations in western markets. The skills required to implement billing systems for the large utility companies, for example, have to be sourced externally from the software houses in the European and US markets. Local skills are then utilised in the maintenance of these systems and in their back-end support. In spite of this, LocalSoft, focuses on developing it's own software for large to medium sized companies in Kenya. Some of the software developed for its clients include billing systems, tracking systems, payroll and financial accounting systems. Most of the development is carried out at the client site, which is the company's IT strategy to ensure the development team remain focused on the project and the client can follow the progress of system development. The organisation chart is relatively flat as shown in figure 4.1.

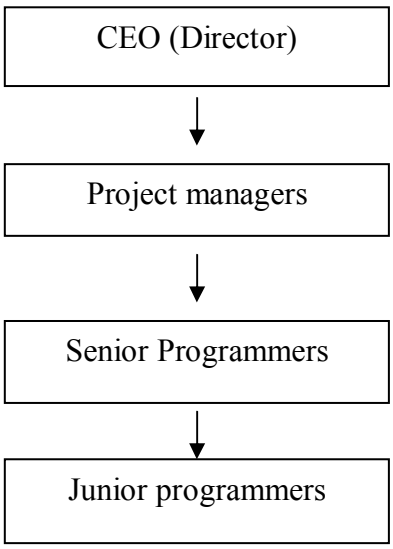

Figure 4.1 Organisation chart

The CEO forms the soul and the spirit of the company; he is also a director of the company. He started LocalSoft as a sole proprietorship and continues to run the company in the same way despite it being registered as a private limited liability

company. He previously had been the IT manager at one of the largest auditing firms in the country. After that he formed a company as a minority shareholder of a computer distribution company that is famous for reshaping the way computers were sold in Kenya. It managed to literally reduce prices of hardware overnight by a fifth through the massive importation of cheaper computers into the Kenyan market. Disagreement within the board got out of hand forcing him to leave the company and begin his own. Thus LocalSoft came into existence.

LocalSoft is predominantly a software development company. This means it designs, develops and deploys software for its clients. The company's "big" clients have been within the top one hundred companies in the country in terms of sales revenue which is a show of confidence in the work LocalSoft does. It focuses on providing affordable business automation and this has worked both to its advantage (getting the big clients) and to its disadvantage (extended project times and affected cash flow).

The project managers are usually programmers with outstanding performance who have been promoted over time. Occasionally however, the company hires project managers from outside the company. Their duties include overseeing that the projects are running according to the CEO's expectations. The CEO runs the company as if it were a sole proprietor as discussed in a previous section. In essence, he does not fully delegate to his project managers. A project manager vividly describes this as:

> *"You feel like his shadow is always hovering over you"* He describes job delegation as, *"He has to be present in meetings when I am delegating tasks to the programmers."*
>
> Programmer, interview, 7 October 2003

The company is run as a "one man show". The project managers therefore do not have sufficient authority to make decisions on the projects they are handling and have to rely on him for decision making. He is present at both high level and low level meetings, that is, meetings involving the directors of the client company and those at the project level respectively. A project manager described his contribution to meetings as more of supervisory.

> *"I get instructions from Henry[*] and then pass it on to the programmers." If there is anything that is not clear, the programmers ask me and I refer it back to Henry for a solution.* On what happens when Henry is not in the country. *" We write him an email and wait for his decisions. And when asked what happens if Henry is handling another project, he replied. " He will make time to come to the meeting even if it means we postpone it."*

Project manager, interview, 15 September 2003

The planning is usually done on a short term basis. Once the director has discussed the project with the client he quickly embarks on it. Unfortunately, this is sometimes costly to the company.

> *As soon as he senses an agreement with the client he embarks on the project. One of the clients refused to pay for the project because they claim they did not make a formal requisition. They said they were simply discussing possibilities of having such a project but did not have the finances to pay for it.*

Project manager, interview, 15 September 2003

The company generally does not insist on formal documents as has been discussed in the previous paragraph. The project manager describes the documentation as:

[*] Names have been changed to protect identity

"Documentation is minimal and not binding, for example payment may not be agreed before hand. Shyness to ask for money.. Afraid to lose customers".

Project manager, interview, 15 September 2003

The director is very good at sourcing projects. We are always busy though sometimes it can be overwhelming. We have too many projects going on and you can be transferred from one to another anytime.

I begun by working in an engineering company and as soon as I got the hang of it, there was a crisis at another project and they needed an expert programmer in databases so I was transferred there. Then the engineering project begun having problems and I had to go back. Sometimes it is frustrating since no sooner do you understand the specs than Henry recalls you.

Programmer, interview, 7 October 2003

The programmer's are divided into senior programmers and entry level programmers. The senior programmers are those who have better programming skills usually due to work experience. They receive higher benefits than the entry level programmers and also have a higher chance of becoming project managers. The programmers work in groups and the size of the group is influenced by the size and complexity of the project. Usually they start as a large team and with time some of the members are deployed to other projects and others quit. The turnover of programmers is usually very high. A project manager describes the situation as:

"Entry level programmers have a dreamy look in their eyes, they see huge prospects in the company and when the reality hits them they quit.."

Senior programmer, interview, 9 October 2003

However the high turnover can also be explained by the high demand for skilled programmers in IT who move to more lucrative places including overseas. A project team consists of a set of independent members who are working on different tasks with the aim of completing a common project. In other words one person per task and many people per project. This definition is derived after evaluating how the team members work. Some authors describe team work as two or more people carrying out the same task. For example, in extreme programming, two members of a team work together on a task (Beck, 1999). When the project manager put forward to the CEO, the quesion as to why two or more team members are not allowed to carry out one task was dismissed as being

> *"too expensive and a waste of resources. Some of those programmers could be deployed to other projects."*
>
> Project manager 15 September 2003

For the project specification an informal meeting is held with the client in which the director of LocalSoft and the director of the client company have a tête-à-tête on software development for the company. An informal agreement on the tentative price and type of software to be developed is reached. The director of the company then relays this information to the project manager and subsequent meetings are arranged between the project manager and the IT manager of the client company. The meetings are highly formal in the beginning and get less formal when the specifications have been defined.

4.4 Client Company

This study is on development of software by Local Soft for an audit firm called K E Auditors*. K. E Auditors has a small IT department made up of five people, the manager, two programmers and a lady who does most of the secretarial duties. Initially K E Auditors had a large IT department of over 30 members of staff. They had programmers and project managers who developed software in-house using the COBOL programming language. The IT department was a very costly venture because the programmers were many and had large pay packages. For this reason, K E Auditors decided to downsize the department and outsource its IT services. The current team in the IT department mainly maintain the old system and offer help desk services. This firm has decided to computerise its operations in order to enhance efficiency and to reduce cases of fraud. The overall aim of the project is to create an intranet system, that

> *"can automate as many processes as possible, that is, store requisitions, telephone billing, printing jobs and taxi requisitions".*
>
> Project manager 15 September 2003

The systems are developed using a piecemeal approach whereby the system is developed on a department by department basis and each project is signed off before the next can begin. The first project was the store requisitions system. The primary aim of this system was to ensure that there was online and real-time information on the goods available in the store. This was necessary in order to ensure the store did not run out of items. It was also used to trace the movement of goods once they left the store so that an evaluation can be done on the consumption. The next system developed was the telephone billing system. The telephone bills were causing concern

* Names of company has been changed to protect the identity.

in the organisation because they were abnormally high and callers were not directly accountable for the calls they made. The aim of the new system was to capture the telephone number of the recipient, the source of the telephone call for example accounts department, the duration of the phone call, the cost of the call and the name of the caller. The names are entered manually at the switchboard because some extensions have more than one person. The calls are divided into official and personal and billed accordingly. A printing system was necessary because of delays caused by queuing for the printer and also for accountability purposes. The new system was supposed to ensure that some departments had priority over the printers and the number of copies printed per user could be accounted for. The system that is currently being developed is the taxi requisition system. Usually the staff who work late are provided with transport to their homes. The current practice had been for a member of staff to dial for a taxi and charge the company. Unfortunately this system did not work very well because it was open to abuse. Some of the staff members would dial a taxi and not be available when the taxi arrives. The taxi driver was then forced to wait for long periods as the staff member got ready. The taxi would not only charge mileage but also include a penalty for the time spent waiting. Another abuse was misuse of taxi for personal business. Staff members would go for shopping or other personal endeavours at the cost of the company. The new system therefore is meant to capture the mileage to everyone's home and this is the only amount a person can claim. The difference is charged to a staff member's personal account.

4.5 Software development process of intranet project

The software development process is described stage by stage that is, from the requirements planning stage to the implementation stage.

4.5.1 Requirements Planning

The IT department in the client company initiated the project. The director of the company had frequent meetings with the director of the client company. The meetings were mainly informal and it was at this point that the pricing and the project completion time agreed.

> *Henry spoke to the guy of K E Auditors and they came up with the budget for the project. The K E Auditors guy was quite impressed with the offer we gave him, because he said that he had contacted some international firms and they wanted to do the same project for almost ten times the price. Unfortunately, we realized that the project was going to eat up a large chunk of the budget because he had failed to consider that we were going to require specialized software. He did not renegotiate but just went ahead with the project even if it was going to bring in very little money.*

Project manager, interview, 15 September 2003

The requirements were revised during several sessions. At first, the meetings involved high-level deliberation, that is between the two directors and when a consensus had been agreed then deliberations between the project manager and the affected departments begun.

> *The director of K E Auditors gave us an outline of the departments he wanted to computerise and he stressed on the importance of having tight controls.*

Project manager, interview, 15 September 2003

After getting the general specification of the areas to be computerised and the expectations, a meeting was held with the head of department. The system was developed piecemeal, that is department by department. All the functions had to be accessed using the intranet but with limited access to authorised users.

We had several intense meetings with the heads of departments so that we could be sure we have captured all the information. It was particularly hard for the phone billing section because it was the first time we had done such a project.

Project manager, interview, 15 September 2003

Getting the requirements was not an easy process as the staff in some departments were uncooperative.

The lady in the printing department was not open with the information. Sometimes she would pretend that she did not understand the question or did not have the information. We sometimes had to report her or get the information from somewhere else.

Project manager, interview, 15 September 2003

The requirements were eventually collected despite the struggles, and the system design and development could begin.

4.5.2 Development stage

As mentioned in the previous section development was usually done at the client's site. The client provided most of the platform tools for development such as the computers and the software. A project manager and the programmers were assigned to a site. The project managers prefered this kind of project because they felt they had more control. Henry was not always present so they has more leeway in controlling the project.

I feel so happy the moment I can get away from head office. At least I have more control over the project. He is like a headmaster, when you are in the head office; you feel suffocated. He always wants to know what you are doing.

Project manager, interview, 7 October, 2003

The project manager gives us the modules we will develop. He is usually careful to give as much detail as possible so that he can be sure we have communicated. It is usually a question and answer session, so at this point you are supposed to clarify what you have not understood. He will come around from time to time to check on the progress of the project and to make sure we are developing it according to specifications. We are not allowed to alter the modules or the design of the program unless the project manager has specified. Of course we fear the project manager and it is usually very tense when he is around. We are happy working when he is not there. Not only do you feel suffocated by Henry but also by the management.

Programmer, interview, 7 October 2003

LocalSoft programmers faced a lot of resistance in the initial stages of development.

"The staff at K E Auditors were not cooperative in giving information, very unfriendly", narrates the project manager.

Project manager, interview, 7 October, 2003

He describes the situation as being hostile especially dealing with the staff at the IT department which he attributed to job insecurity.

He said, "they feared that K E Auditors would eventually outsource everything " and this was compounded by the fact that the staff at started confiding in LocalSoft for troubleshooting instead of their internal IT department"

Project manager, interview, 7 October, 2003

Eventually K E Auditors I.T staff resorted to sabotaging the work of LocalSoft by introducing bugs in the system and making it look like the new system is not working satisfactorily.

"The IT manager made some adjustments which interfered with some programs".

Project manager, interview, 7 October, 2003

The problems got worse and it was becoming impossible to work until the project manager in LocalSoft had to consult with his director. The director then consulted with the director of K E Auditors and after consultations and assurances of job security the staff became cooperative. The project then proceeded as planned. During the project, the LocalSoft director organised meetings with the project manager to discuss the project specifications. In these meetings, the director gave his input on how he felt the project should proceed, that is, the duration and clarification of specification. The project manager's input was minimal despite the fact that he had frequent meetings with the client. During development the project manager delegates modules to his team of developers.

"The project manager gives us work according to our strengths, for example, I am normally given website design and Pato gets to do the database".

Programmer, interview, 7 October 2003

The project manager then instructed the team on what to do and clarifications were done at this stage. Usually the project manager's word was final and the team carry out instructions as directed. The team had frequent discussions among themselves and 'on the spot' meetings with the project manager for any clarifications. The members in the team viewed themselves as individuals and not as a tight community.

> *We sometimes work until midnight and during this time we all go to eat together. On other days everyone takes care of themselves. It is not usual to see team members relating after work. Pato does not even know my home. When he came late to work I did not cover up for him. Why should I?*

Programmer, interview, 7 October 2003

The team members discussed the project among themselves and sometimes consulted with each other. The consultations however were only to do with the project and they considered it absurd that they should talk about personal matters even during a lunch break.

> *I have no idea what Charlie is up to in his personal life. We just don't discuss those things. Me I live my life as best as I can. My only concern is my mother. I have seen so many programmers and project managers, why should I be concerned about their personal stuff. We only discuss the project. During break we take time to do personal stuff, for example, smoking or reading email.*

Senior programmer, interview, 9 October 2003

4.5.3 Implementation stage

After the system had been tested and the project manager gave his approval, the system was ready to 'go live'. At first dummy data had been used to test the system and later on the real data was input and tested. However, the staff at K E Auditors

rejected the new system and continued to use the old one claiming that the new system had lots of errors and did not have some functions.

> *They had all sorts of complaints about the new system. They were reluctant to learn how the operations worked and just rejected the system in totality.*
>
> Project manager 10 October 2003

The staff had to be trained on how to use the new system. They were very uncooperative and did not ask questions during the training period. It was difficult to know whether they had fully understood the functionality.

> *We just did our job anyway whether they wanted to learn or not. They did not ask questions and did not seem to be paying attention*
>
> Project manager 30 September 2003

The management of K E Auditors were adamant that the new system should work and therefore a memo was sent to the IT department and to the staff of the affected departments. The memo said that the staff were required to offer assistance to the company developing the new system and it stressed that the new system was here to stay.

> *We spent the whole day and most of the night at the site and the system worked very well. The new data was tried and the output was correct. We then left knowing that the system was functioning ok.*
>
> Project manager 30 September 2003

The staff cooperated but this was not the end of the problems: Some of the members of staff, particularly the IT department, began to sabotage the system. It was reported that they deliberately put a bug in the new system. The director of LocalSoft was

informed less than a month later that the new system had crushed and that it was giving a lot of problems. The IT department had tried their best to rectify the problems but it had not helped. The directors of the company were getting weary of the complaints.

> *We backed up all the data and tested the system. There was something very strange this time. It was hanging all the time. This did not happen when we first tested the system. We went through the entire code and finally we discovered that the code had been altered. This could only have been done by the IT department because they were the only ones who were knowledgeable in this area.*

Project manager 30 September 2003

A decision was then taken to prevent alterations to the code and a report was written to management about the findings. LocalSoft was then recalled to offer fresh training on the use of system and this time the staff were more cooperative.

> *They asked lots more questions and showed a keen interest in learning how to operate the new system.*

Project manager, interview, 30 September 2003

The system was accepted and did not have any major issues after that. LocalSoft continued to maintain it as stated in the contract and the users seemed more comfortable with it as time went on.

> *From then on we carried out the usual maintenance and the IT department only called us for genuine problems.*

Project manager, interview, 30 September 2003

4.6 Conclusion

This chapter has given an overview of a software development company that developed software for a local client. The software company and the client company have been described and then the software development process has been reviewed.

Chapter 5: Analysis

Chapter summary

This chapter is an analysis of the findings from the case study. The results are presented in a tabular format in order to make it easier for the reader to analyse the results at a glance.

5.1 Introduction

In chapter 3, we saw that culture can be studied using Hofstede's dimensions. From the findings of the case study it is possible to classify the culture of LocalSoft ISD into Hofstede's five dimensions.

5.2 Power distance

Table 5.1 provides summary results of the findings regarding power distance. Overall the respondents indicated that the company had a high power distance. From the above statements we can deduce that the power distance between the management and subordinate is high.

Results of power distance

Criteria	**Findings**
Decision making is mainly done without consultations.	Henry makes all the decisions and the project managers do not have authority to make decisions without consultations. The company is run as a 'one man show'
Non managerial employees fear disagreeing with their managers	The programmers do not alter the modules or the design of the program unless the project manager has specified. They fear the project manager and are usually very tense when he is around. They are happy working when he is not there

Subordinates do not have an idea of the company's activities other than what they have been assigned.	The director is in charge of decision making and he does not involve the subordinates. The subordinates therefore are not always aware of what is going on in the company. Project manager was unable to answer questions on some issues concerning the company.
Have a good working relationship with your project manager.	There is a lot of tension at the work place. They also claim to be suffocated by Henry and by the management.

Table 5.1 Power distance results

The subordinates generally do not play an active role in decision making and their relationship with their superiors is described as 'fearful', 'stressful' and 'suffocating'.

5.3 Uncertainty avoidance versus uncertainty acceptance

The summary results of the findings of uncertainty avoidance versus uncertainty acceptance are presented in table 5.2. The respondents indicated that the company tends towards uncertainty avoidance. The staff are not given allowance to exercise their creativity; they work in a supervised way to reduce the probability of things going wrong.

Results of uncertainty avoidance

Criteria	**Findings**
Well kept documentation	There is little documentation especially when making the contract, to the extent that some companies have pulled out of contracts without legal implications.
Work in a well-defined job situation where the requirements are clear.	There is an organisation chart that spells out the hierarchy of the staff. Each staff member is assigned duties according to their rank and specialisation. For example, there are senior programmers, junior programmers and project managers. Among the programmers there are some who are assigned database design while others website design.
The organisation rules are hardly obvious: employees work autonomously	There is little autonomy. The employees wait for tasks to be delegated to them. The project manager does spot checks to make sure the project is being developed as planned.

Company rules cannot be broken even when it is obvious they will go against the company's best interests.	Some of the programs have been developed even after realizing that they are under budgeted.

Table 5.2 Uncertainty avoidance results

The case study results show that there seems to be very low tolerance for unplanned for or surprise situations except when securing the contract. The employees are closely supervised and they are given detailed instructions on how to develop their projects. The employees do not have the freedom to make alterations unless they have been approved or suggested by management. They are stressed most of the time for fear that they may make a mistake which will most likely jeopardize their job.

5.4 Individualism versus collectivism

Individualism versus collectivism evaluates the level of participation in a group. The results in table 5.3 indicate that the staff are individualistic. However, there are incidences where collectivism is implied.

Results showing individualism versus collectivism

Criteria	**Findings**
Two or more programmers work on a task together.	This is considered a waste of resources.
Work with people who cooperate well with one another	Members of a project team do not know much about each other and do not relate on a personal level. Everyone works on the task assigned individually.

Have an opportunity for helping other people	Members of a team do not cover up for each other when a team member does not come to work. They are also not interested in the personal life of their workmates thus denying themselves opportunities of being helpful. Do not have a strong welfare.
Have challenging tasks to do, from which you can get a personal sense of accomplishment.	Work is assigned according to an individual's strengths; this gives a person a sense of personal accomplishment.
Fully use your skills and abilities on the job	It is not possible for the programmers to adapt their own approach because of the close supervision.
Have considerable freedom to adopt your own approach to the job.	There is limited freedom to adopt your own approach. The employees wait for tasks to be delegated to them. The project manager does spot checks to make sure the project is being developed as planned.

Table 5.3 Individualism results

From the results it can be deduced that the programmers do not consider themselves as a 'family', they see themselves as individuals and the other programmers as co-workers. They do not know much about each other's personal life and do not cover up

for each other. There is individual regulation of behaviour, self-sufficiency, unrelated personal and in-group goals and there is no sense of common fate (Triandis, 1998). They do not trust each other's work enough to give them the freedom and autonomy to adopt their own approach to the job. Additionally, having more than two programmers on one module is considered a waste of resources and when they discuss programming it is in terms of an individual achievement. For example, during the interview the programmers did not refer to other members. They continuously used the words "I" even when more than one programmer did the project. Furthermore, the work is divided and given to individuals instead of to a group and each one is individually accountable for their work.

5.4 Masculinity versus femininity

Table 5.4 shows the results of the findings of masculinity versus femininity. The results tend towards masculinity, as there is very little evidence of nurturance or personal interest in the staff welfare.

Results showing Masculinity versus femininity

Criteria	**Findings**
Employees are very career-oriented; good relationships with co-workers are less important.	When the programmers are employed they have a 'dreamy look' thinking of career prospects and the financial gains they hope to make. Subordinates do not cover up for each other when one does not come to work. They report absenteeism to management without fear that it could strain their relationship.

Have good physical working conditions (good ventilation and lighting, adequate work space etc)	LocalSoft has other business activities in the same vicinity which compete for space with the software company therefore the work space is small.
Have an opportunity for advancement to high-level jobs	There is opportunity for advancement to high level jobs as can be seen in the organisation chart. A junior level programmer can be promoted to a senior level and finally a project manager. The turnover is also very high therefore creating room for vacancies.
Get the recognition you deserve when you do a good job	Recognition is by way of promotions.
Make a real contribution to the success of your company	The contribution the staff make to the company is by virtue of the software they produce. Otherwise they do not make any other direct contribution to the success of the company because they are not involved in decision making.
Have good fringe benefits	Did not mention any extra ordinary fringe benefits.

Table 5.4 Masculinity results

The results are inclined towards masculinity as opposed to femininity. Recognition is by way of financial rewards as opposed to non-financial rewards. They do not have acknowledgements such as announcing it in the company magazine, email or during staff meetings. There are no 'special benefits' they get such as extra holidays, off days and family fun days. The benefits are in terms of competitive pay packages, which include house allowances and overtime payments. Additionally, the employees are very career oriented and talk of work in terms of financial gains as opposed to personal fulfilment.

5.6 Short term versus long term planning

Long term planning demonstrates the ability to foresee into the future and make decisions accordingly. From the results shown in table 5.5 it can be seen that the company is oriented towards long term planning.

Results showing short term versus long term planning

Criteria	**Findings**
It is very important to produce software according to specifications even when it exceeds the budget	The director will not turn down an offer even when it is too costly to produce.
Work in large projects of more than six months from start to completion	The project described in the case study was longer than six months though it was subdivided into manageable portions. There are also arrangements for maintaining the system.

Reuse resources whenever possible	Documentation of the code is kept and it is reused whenever possible.
Ensuring continuity	Contingencies were placed to prevent a recurrence of sabotage.

Table 5.5 Long/short term results

Long term planning is demonstrated by keeping documentation of code for future purposes. Undertaking projects that are large and take more than one year to complete also proves that the company is not interested in immediate gains which would be a characteristic of short term planning. The inability to turn down projects even when they have proved too costly to develop may be a strategy to get established in the market and therefore attract future projects/clients. Long term planning is demonstrated by virtue of the fact that they have arrangements for maintaining the system, the staff were trained to handle the system and contingencies were placed in order to prevent a recurrence of sabotage. Long term planning is also depicted by proper documentation which enabled LocalSoft recover the system after the sabotage attempt. They were able to identity and isolate the errors.

5.7 Conclusion

From the results it can be observed that LocalSoft has the characteristics shown in table 5.6 below.

Summary of results

Power distance	High
Uncertainty avoidance versus uncertainty acceptance	Uncertainty avoidance
Masculinity versus femininity	Masculinity
Individualism versus collectivism	Individualism
Short term versus long term planning	Long term planning

Table 5.6 Summary of results

Chapter 6: How culture influences ISD in LocalSoft

Chapter summary:

The chapter describes how the culture of the organisation has affected the way they develop their information systems and the conflicts that may occur because of adapting an approach that is not suitable for their cultural set up.

6.1 Requirements planning

Requirements planning is a very important stage in the systems development life cycle and if inadequate information is gathered at this stage the chances of the project being successful are minimal (Sommerville, 2001). From the findings of the research it can be seen that LocalSoft has high power distance which suggests that participation during the requirements planning stage will not be widespread and will only involve individuals from top management (Venkatachalam, 1995), for example, in the case study, the directors of the company are the only ones involved in deciding the new project's costs and areas to be computerised. In some instances they may not be the most appropriate people for such negotiations because they may not have the necessary skills. Instructions from the director are passed down to the project manager and in case of doubt they refer back to him. Waweru (1984) argues that:

> *In Kenya, great care must be taken to avoid arousing feelings of jealousy and resentment on the superior, who may feel that his authority is being eroded.*

LocalSoft also has a high degree of uncertainty avoidance which is depicted during information gathering. The lady in the printing room is unwilling to part with information for fear of how this information will be used. According to Ford (2003) uncertainty avoidance makes the staff experience higher resistance to new applications because the staff are more comfortable working with methods that have worked well over the years. They want to avoid surprises that are characteristic of new methods of working.

6.2 Analysis and design

The analysis and design stage is the stage where the requirements definition is transformed into a working program, therefore if the requirements are wrongly collected then a wrong program will be developed (Yeates, 1994).

From the findings of the research it can be seen that LocalSoft has a culture of individualism. The programmers work on individual models and the project manager reviews it. In such a situation every member of a team would like to be recognized for his personal effort and not as a team. During peer to peer reviews members of a project team are supposed to evaluate each others work which may become difficult in the case of LocalSoft because each person views the work he has done as an individual effort and not as team work. Therefore corrections may be interpreted as undercutting and may cause rivalry making it difficult to have walkthroughs and team member reviews. Integration testing may also become difficult because of lack of synchronisation during programming.

In addition to being individualistic, LocalSoft is characterised by high power distance between management and subordinates. Teams will therefore include management, information systems professionals and end users who do not view each other as professionals because of the high power distance between them, therefore hindering the flow of feedback in the team (Venkatachalam, 1995).

Uncertainty avoidance cultures ensure that work is done according to rules and regulations. LocalSoft has characteristics of high uncertainty avoidance which is demonstrated by the supervisor checking the project from time to time, the programmers are nervous when the project manager is around and there is also lack of initiative on the part of programmer to make suggestions. Lack of initiative can stifle innovation because the programmers will not feel free to try out other ways of solving

problems. It can also be expensive given that newer cost saving approaches may not be utilized.

6.3 Implementation

Implementation includes data changeover, user training, going live and maintenance (Yeates, 1994). This is a very important stage in this project because it involves a lot of human interaction and thus the cultural complications become very obvious. The research findings suggest that uncertainty avoidance is very high, which makes end users hesitant to adapt new methods which are not guaranteed to work as effectively as the old methods (Venkatachalam, 1995). According to Hofstede (1980), the cultures that avoid uncertainty are those that minimize the possibility of 'surprises'. Furthermore the organisation is characterised by high power distance hence, decision making is left to management and the staff have very little or no role in decision making. The organisation also depicts a high level of masculinity making them prefer to have a working system as opposed to finding out the new system would affect the staff, for example their morale. The satisfaction felt by end-users is not as important as the technical success of the system (Nelson, 1992).

Chapter 7: Summary Conclusions and future work

7.1 Summary

The first chapter is an introduction to the thesis and it highlights the main areas that are discussed in the thesis which are:

- To define culture and the models used when studying culture
- To explore the effects of culture on ISD

The second chapter is the research methodology. The research question is:

How do Cultural influences affect software development in a Kenyan company?

The case study has been chosen as the most suitable approach for this research. In the third chapter, Hofstede's five dimensions of culture are identified and discussed. They include: Power distance, Individualism versus collectivism, Masculinity versus femininity, Uncertainty avoidance and Long term versus short-term orientation. The fourth chapter, is a description of the company under study using a case study. The sixth chapter then analyses the culture of the company from the results of the case study. A summary of the results are shown in table 7.2.

Culture of LocalSoft

Hofstede's dimensions	**Results**
Power distance	High
Uncertainty avoidance versus uncertainty acceptance	Uncertainty avoidance
Masculinity versus femininity	Masculinity
Short term versus long term planning	Long term planning
Individualism versus collectivism	Individualism

Table 7.2 showing the culture of LocalSoft

Chapter 7 is a discussion of the findings. This chapter shows the influence culture has on ISD in LocalSoft.

Requirement planning	High power distance makes participation during the requirements planning stage involve only individuals from top management High degree of uncertainty avoidance which makes them want to avoid surprises that are characteristic of new methods of working.
Analysis and design	The programmers work on individual models and having more than two programmers on one module is viewed as a waste of resources. Because of the high power distance teams will include management, information systems professionals and end users who do not view

	each other as professionals, therefore hindering the flow of feedback in the team
Implementation	Uncertainty avoidance makes end users hesitant to adapt new methods.
	Because of the high power distance culture a new system is imposed on the staff without finding out how they feel about it.
	The high level of masculinity makes the company emphasize on getting a working system as opposed to finding out the influence of the new system to the users.
	Long term planning enables the company to have arrangements for maintaining the system and train the staff and contingencies were put in place in order to prevent a recurrence of sabotage.

7.2 Conclusions and Recommendations

- In order to effectively collect requirements LocalSoft should use methods that do not require brainstorming sessions or informal meetings because the top management are not receptive to ideas or decisions from their subordinates. It would be advisable to use formal meetings so that there is an opportunity for all participants to air their opinions.

- Unclear or wrong requirements may be collected because the project managers are not present during the requirements definition, in this case, it would be advisable to use ISD approaches such as the evolutionary approach. An evolutionary approach involves carrying out the same activities over a number of cycles in order to clarify the requirements (Yeates,1996). Figure 7.3 shows the SDLC (system development lifecycle) with information evolving at the requirements stage.

- LocalSoft has an individualistic and high power distance culture making it difficult for the team members to cooperate and collaborate and in spite of the fact that it is important for programmers to constantly review each other's work in order to prevent errors commonly found during integration testing. Ford (2003) suggests that participative ISD is not appropriate in countries with high power distance because they emphasize professionalism and expertise instead of emphasizing on abilities to enhance client participation. ISD methods that can counter this problem include using CASE tools where affordable or methodologies that ensure programmers review each other's work such as Fagan inspections. A Fagan inspection is a formal walkthrough where the author of a piece of work reports to the project manager that his work is complete and ready,

then his work goes through a six stage review process (Planning, overview, preparation, meeting, rework and follow up). The advantage of this method for LocalSoft is that it does not require team members to work together and it is suitable for high power distance cultures because the subordinates (programmers) report to the superiors (inspectors).

- Another possibility in getting feedback among team members is by encouraging peer to peer review so that programmers have a chance to see what their peers are doing. The peer to peer reviews can be done with the assistance and coordination of the project manager or other facilitator in order to ensure the programmers do not feel like a peer is deliberately undercutting them.

- The client company is characterised by high uncertainty making it difficult to change over to the new system. In order to address this problem the staff should be introduced into the new system in phases instead of all at once. The first phase of the system should be in non-core areas and other non-essential areas until the staff see the benefits of the new system. Figure 7.3 shows the system being implemented in phases.

- Another option would be to allow both systems to run in parallel though this would be very costly eventually phasing out the old system. This way the old members of staff will gradually be incorporated into the new system and redundancies can be dealt with gradually therefore easing the tensions that are characteristic of mass staff layoffs.

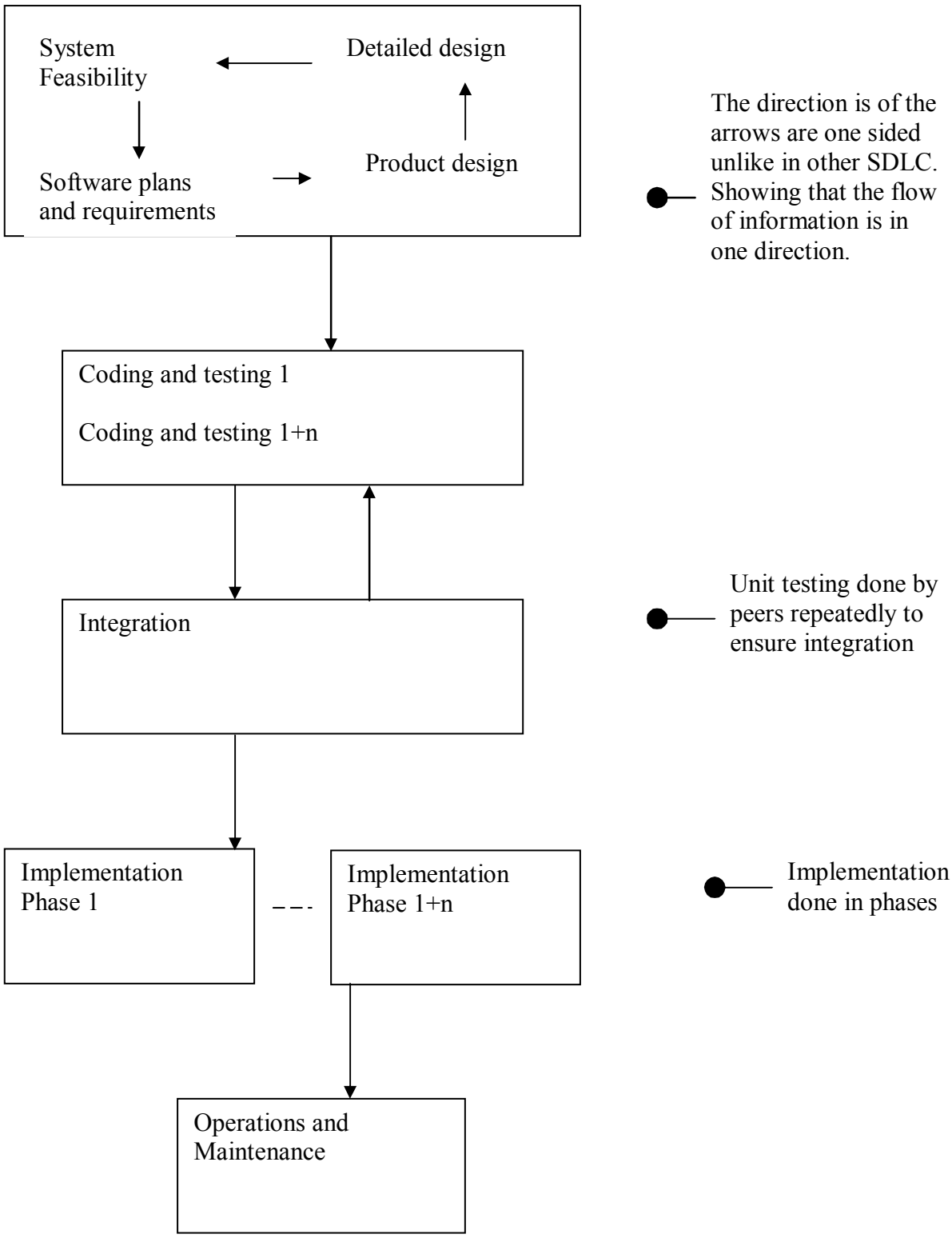

Figure 7.3 Recommended model

7.3 Limitations of the study

- Some of the programmers who worked in the project left the country
- Some of the meetings did not yield much information because the programmers were too scared to give vital information. It required several sessions to make them comfortable enough to answer the questions.

7.4 Future work

To compare and contrast using Hofstede's dimensions the culture of ISD development in a developing country and that of an industrialized country.

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Appendix

Interview questions

The interview questions are based on Hofstede's model and on research done by Oudenhoven 2001, Venkatachalam 1995, Evaristo, 2003, Meister, 2003, Hsu 2002)

Power distance: To find out the degree of power distance in the company the interview questions were based on the following traits:

- Decision making is mainly done without consultations.
- Non managerial employees fear disagreeing with their managers
- Subordinates do not have an idea of the company's activities other than what they have been assigned. Usually because they are not involved in the decision making.
- Have a good working relationship with your project manager.

Uncertainty avoidance: To find out the degree of Uncertainty avoidance in the company the following traits are used: -

- Company rules cannot be broken even when it is obvious they will go against the company's best interests.
- Work in a well-defined job situation where the requirements are clear
- The organisation rules are hardly obvious: employees work autonomously
- Employees feel nervous or tense at work
- Well kept documentation

Masculinity versus Femininity: To find out the degree of uncertainty avoidance in the company the following traits are used: -

- Employees are very career-oriented; good relationships with co-workers are less important.
- Have good physical working conditions (good ventilation and lighting, adequate work space etc)
- Have an opportunity for advancement to high-level jobs
- Get the recognition you deserve when you do a good job
- Make a real contribution to the success of your company
- Have good fringe benefits

Individualism versus collectivism: To find out the degree of individualism or collectivism in a company the following traits are used: -

- Work with people who cooperate well with one another
- Fully use your skills and abilities on the job
- Have an opportunity for helping other people
- Have considerable freedom to adopt your own approach to the job.
- Have challenging tasks to do, from which you can get a personal sense of accomplishment
- Two or more programmers work on a task together.

Long term versus short term orientation: To find out the company's orientation to work we use the following traits.

- It is very important to produce software according to specifications even when it exceeds the budget

- Work in large projects of more than six months from start to completion
- Reuse resources whenever possible