REQUIREMENTS ENGINEERING FOR A SOCIAL INFORMATICS SYSTEM: THE CASE OF NDUMBERI COFFEE GROWERS CO-OPERATIVE SOCIETY LTD

BY

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DECLARATION

This research project mv original work and has not been presented lor a degree in an> other university.

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DEDICATION

! dedicate this research first and foremost to the l.ord Jesus Christ without whose mercy, protection and love. I would not have seen the light ofday secondly to rm beloved husband, my two children and my parents for the support, prayers and understanding

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ABSTRACT

Globalization and increased competition is compelling agricultural cooperative societies to review iheif operations and processes so as to comply with the desired service delivers level to remain relevant In this regard they arc increasingly seeking opportunities Tor improvement

I'his research focused on Ndumbcri ColTec Growers Cooperative Society (NCGCS) a member led organization. I he objective of the study was to understand the NCGCS society member management information system, requirements engineering model and to highlight challenges oi requirements engineering process for u social informatics system.

I he current member and management information system is manual. Members are increasingly becoming more demanding lor better services, coftcc buyers demands arc requiring that they improve on record keeping and general technology trends are compelling them to review how they do business. The management is therefore anxious to explore opportunities on how they can comply with the requirements.

Skill Systems Methodology (SSM) was used as » tool for analyzing the society requirements. C'heckland's Soil Systems Methodology was used since it provides an opportunity to capture stakeholder \ lews and addresses both "hard" and 'soil' aspects of the learning experience.

From the literature review, many critics attribute system failures to focus on hard issues with little attention to soft issues. The methodology addressed this by highlighting the soft issues like attitude ol the management to changc. political issues and organization culture issues and show where improvements can be made. In addition the methodology served as a lirst step towards sensitizing thein of the organization change opportunity.

It is evident that the society management is aware of the opportunity to utilize information technology lo improve service deliver) to the tncinberv Ihey are anxious to use computerization it it can help them access markets lo fetch belter colTcc prices and decision support. Ihey also would embrace computerization if it would seal loopholes where clerks collude with members to falsity producc receipts In addition they would appreciate it if it hastens data processing The challenge is that they lack software to suit their operations and skilled information technology staff.

LIST OF ABBREVIATIONS

Coop	Cooperative
CIS	Cooperative Information System
FAO	Food and Agricultural Organization
K |	Infonnalion Communication and I ethnology
IS	Information Systems
If l I	Institute of Electrical and Electronic* Engineers
IT	Information technology
MoCDM	Ministry ol Cooperative Development and Marketing
MoA	Ministry of Agriculture
NCGCS	Ndumheri ColTec Growers Cooperative Society
RE	Requirements Engineering
SSM	Sort Systems Methodology
HPS	I ninterrupted Power Supply

Chapter I. INTRODUCTION

1,1 Background

Pic Cooperative AtI revised 2004 defines a coperative as a form of business ownership that consist* of n group of people who have joined together to perform a business function more cfllcicntly than each individual could do alone. The purpose of a cooperative is not to make a profit for itself, but to improve each member's situation However, members of certain types ofcooperatives do make a profit by selling their product and'or offering services to customers who aie not coop members. They are therefore formed for social reasons Hie social reasons influence how business is done significantly.

Globalization, trade liberalization, deregulation and changes in political and economic paradigms ha\e led to major changes in the political, social and economic environments within which agricultural cooperatives operate. I he decline of government assistance and growing competition from the private sector are now forcing cooperatives to re-assess their performance and seek ways and means to improve their business efficiency In providing better member services (http;//ww\v.fao.org/sd/dim_in3/in3_030301_en htm. June 2(M)K)

Rai L). (2004) highlighted the main problems faced by agricultural cooperatives in developing countries as weak management, poor training and motivation, lack of participation by members, lack of savings, capital formation and business diversification, lack of professionalism and indifferent decision-making, lack of appropriate policies and legislation in support of agriculture cooperative development, limited information of market trends and price movements. He further noted that the purpose ofcomputerization is not to obtain one-

rime data or information, but to provide a framework for live, interactive collection and dissemination of data such as the provision of market and price information.

The Ministry of Cooperative Development and Marketing in partnership with the Food and Agricultural Organi7.ition of the United Nations (FAO), Kenya National Federation of Agricultural Prtxlucers (KINIAP), and Kenya ICT Federation launched Coopworks in November 2007. Coopworks 2.0 i> a Member and Management information System, which is available to any interested organization without any license. Version 2.0 has been implemented in two dairy cooperatives that are Oloolaiser farmers Cooperative Society, Ngong and Wamunyu Farmers Cooperative Society in Machakos Version I (I is in use in I'ulaga Farmers ('imperative Society Though the system «as to be adopted by any produce marketing society, it needs to be tailor made to suit different producer crops operations, for example, a cottee cooperative society operations and computations will vary from the dairy operations.

It is evident that information management is critical for cooperatives to remain competitive and relevant. I his is necessary to comply with market demands and meet with owners needs. Most cooperatives at the moment use manual systems. As Kai noted above, there is an opportunity to improve on how business is done by adopting technology to improve on information management. Information Management defined by W ilson (2002. 1994) as "the application of management principles to the acquisition, organization, control, dissemination and use of information relevant to the etVectivc operation of organizations of all kinds" It is increasingly being recognized as critical in the context of organizational performance. He defines information as referring to "all types of information of value, whether having their

origin inside or outside the organization" thus alluding to the various sourecs of information that is central to the concept of Information Management (IM).

To manage information effectively there is need to develop information management systems. O'llrien (2000) delmcs an information system as an organized combination of people, hardware, software, communication networks, and data resources that collect, transform, and distribute information through the organization

Wiggins (2000) argues that controlled systems development as typically based on well known development life cycle, should ensure that the operational system satisfies the users real information requirements, is easy to use and to operate and is easy to maintain i.e. to correct problems that occur and is easily modified or enhanced. Focus of most system development methodologies is on objective and quantitative aspects of a problem area often to the detriment ot subjective and qualitative issues.

The IHT- (2005) acknowledges that high-quality requirements are at the heart of successful products, in that a product is successful if it effectively satisfies some essential need. I nginccring successful products involves understanding the needs ol users, customers, and other stakeholders, as well as the contexts in which the product will be used. I hat is modeling, and analyzing the stakeholders' requirements; and using these tvquirements to guide design decisions, to define acccptancc criteria for evaluating the UnaI product, and to constrain the product's evolution. Requirements,encompass more than desired functionality Users increasingly demand systems that are usable, reliable, secure, and responsive, while

product developers expeel lo be able to adapt and evolve products rapidly. In response to users' changing needs.

The objective of this study was requirements engineering for a soci.nl informatics system the case of Ndumbcri (offee Growers Cooperative Society. I he study undenook to carefully determine the information systems requirements for the computerization of the society. Soil systems methodology was used to determine the requirements.

During preliminary literature review many of the writers attribute low adoption and assimilation of some information systems to the failure on the p;iri of the developer to capture the soft' issues of the system, which can infiuence utilization of a system significantly,
ibis is why soft systems methodology of formulating user requirements was used to guide software development as it highlights the soft issues that significantly impact on a system like this, which has a large social influenee component

Alter (2006) points out the fact that techno Centric analysis of business and information technology problems is one ot the many causes that contribute lo the pew results in information systems development.

Kcleman (2003) acknowledges that approaches to improve the quality in service organizations have in general been shirting their emphasis away from technical conformance to specifications, towards pleasing the customer by meeting and exceeding hivher expectations.

Carull and Rosson <2007> slate that direct involvement of end users and other stakeholders in design have become a standard design paradigm in Informatics. I hey state that participatory design integrates two radical propositions about design. I he lirst is the moral proposition that the people whose activity and experiences will ultimately be affcctcd most directly by a design outcome ought to have a substantive say in what that outcome is. The moral proposition is that users have a right to be directly included in the process of design. I he second is the pragmatic proposition that the people who will need to adopt and perhaps adapt to an artifact or other outcome of design, should be included in the design process, so that they can offer expert perspectives and preferences regarding the activity that the design will support and most likely transform. The pragmatic proposition is that directly including the users input will increase the chancesol a successful design and outcome

Evidently from the above radical propositions, they challenge conceptions of design as a profession. Ihe designers' role is to faithfully translate, collaborate and respond to the concerns of the other stakeholders.

1.2 Nduinheri Coffee Growers Co-operative Society l.td (NC(.CS)

The primary goal of the cooperative is the economic benefit of the members; Ihere are social and ethical aims as well The members are entitled to special services and the associated benefits pn»duccd by the co-operative. Ihe members arc also allowed to participate in administration and carry the responsibility of the profitability, continuity of operations as well as the responsibility tor society and the environment.

Co-operatives are democratic organizations controlled by their members, who actively participate in setting their policies tinJ nuking decisions. Men and women serving .is elected representatives are accountable to the membership In primary co-operatives members have equal voting rights (one member, one vote). Members contribute equitably to. and democratically control, the capital of their co-operative. At least part ot that capital is usually the common property of the co-operative. Members usually receive limited compensation. If any. on capital subscribed as a condition of membership. Members allocate surpluses for any or all of the following purposes: developing their co-operative, possibly by setting up reserves, part of which at least would be indivisible; benefiting members in proportion to their transactions with the co-operative; and supporting other activities approved by the membership

Ndumbcri (offec Cirowcrs Co-operative Society (NCGCS) is in Kiainhu District A review of tl»e members register shows it has 2.500 registered members however, only 2.000 are active. Over the vcars the active membership has been declining. I he management attributes this to neglect of coffcc growing by the members. I he members have tended to neglect the business due to the low returns realized. I he producers all grow Arahica coffee. The society lias three pulping stations namely Nyaita. Ndumbcri and RiaKii I he society headquarters is located about 35 minutes drive north west of Nairobi on an all weather road.

In 200X, the management expects a bumper harvest. I his is partly because ol the sensitization campaigns promoting increased production and value addition undertaken under the Government of Kenya. World Dunk funded value chain based matching grant fund project in

collaboration with Collar Support Network in 2006/7. The socicty under the project also achieved Utz Kapeh Certification.

lite l/tz Kapch website describes lit/ certification as a worldwide certification program that vols the standard for responsible coft'ec production and sourcing. Utz Kapeh, which means "good coffcc" in a Mayan language, gives the assurance of social and environmental quality in coffee production that coffee drinkers expect, IJtz Kapeh certification provides the answers to where the coftcc cornea from and how it was produced. I he certification program entails requiring the society to achieve certain levels of hygiene standards, environmental pre conditions fulfillment, safety requirements fulfillment production standards fulfillment and member record maintenance. I he certification needs to he renewed annually I hey therefore must endeavor to maintain the standards y ear alter year

This society appointed Socfmaf as their marketing agent, which is the only mill certified with IJtz Kapch chain of custody. Association with these development partners is expected to boost production ot quality coffee, facilitate market access, increase farmer take home package and assist the farmer to adopt good agricultural and processing practices.

I he socicty facilitates hulking ot cotfec. pulping and collective marketing. It receives payment for the produce on behalf of the members and then pays the individual members. It purchases farm inputs where it has a better bargaining power due to the bulk before selling to members at a slight markup. It advances members picking advances and other advances The Utz Certification programme requires that they maintain statistics on each member detailing the number ot trees, acreage and farm inputs application per member.

hollowing the capacity building and financial support under the project, the society purchased j computer and n 3 in I printer. They have an internet connection using a lelkom Wireless connection. The bookkeeper and factory clerk under the project were trained on basic use of the computers and currently use the computer to type correspondences and trial balance. The bookkeeper reckons that consolidation of member data from the various factories would be faster.

Also following the capacity building, the society chairman feels there is an opportunity to utilize Id in marketing of the coffee online lie acknowledges that from the exposure l»e has had of the buyers, he requires real time production statistics on the produce to effectively market the collec. He can also be able to handle queries more efficiently using email and later develop a website. Besides Utz kapeh program information requirements compliance is demanding.

I he management committee through the Ministry of Cooperative Development & Marketing participated in the launch ol'Coopworks in November 2(M)7. Unfortunately Coopworks has been tailor made for the dairy cooperatives. Requirements tor a collec cooperative society have not been determined. This study will therefore undertake requirements engineering lor a member and management information system for a coffee cooperative society

I he management committee is elected I here is an eminent risk of politicizing issues. I here is need to understand the environment lo avoid politicizing the computerization project.

I J Statement ul the Research Problem

NCCC'S management being members' representatives arc accountable to their members. Oiev are expected to support the members by providing prompt and reliable services as well as provide other partners with relevant data They arc expected to comply with government reculation and guidelines for example they must produce audited accounts. They must safeguard farmers' assets and thus must ensure that they have insured the assets and even the produce in transit. I hey must seek new markets lor example 'Ul/ Kapeh" tlut has its own information demands yet to service this market they must comply with stringent compliance requirements. Hanks require accurate farmer production records ami inputs requirements so as to assess the level of input requirement and expected productivity. Growers also demand timely payment

Further, under protectionist regimes, governments have historically intervened to protect and stabilize prices. \\ ith liberalized markets nnd collapse of marketing hoards, the cooperatives have a high-risk exposure to volatile world prices. I hey require current information to effectively bargain their price and cushion themselves against currency fluctuations.

lite management requires forecasts to meet increased user demands. On the other hand, lor efficient farm management and Increased productivity, cooperatives should have information on member's soil and leaf analysis, other farm details like number of trees for its member- to be able to determine what chemicals and fertilizers are required and forecast productivity.

I he motivation lor the study is on the management indication that they would want to review how the society data is being collected, organized and disseminated and whether they .ire able lo service various user needs. Kathcr establish if things are working the way they should, find out why or why not and explore if there is anything that can be done about it. I hey wish to conlirm it the management uses the information available or is there a way that can facilitate them to use it more ctlcctivcly. I Ind out how they organize and manage information. It is the classic situation of it not being a "problem" but an "opportunity". In addition the study will document the process and challenges for such a system requirements determination

Though Coopworks has been developed targeting agricultural cooperative society's specific requirements for a coffcc cooperative society member and management information system has not been developed. I his is the motivation ol the studv.

1.4 Objectives of the Study

1.4.1 To determine requirements lor a social informatics member management information system for a coffcc cooperative society, the case of NC'GCS,

1.4.2 To establish challenges of the requirements analysis process for a social inlbrmalics syslcm.

Importance «»f the Study

Kcccntly with globalization and liberalization, there is increasing demand and pressure for p*»*lucer societies to utilize technology to improve on service delivery to their members. A

survey of most of the producer societies is that most have manual systems and there little documented evidence as to their Information systems performance.

This i> a requirements engineering study for NCGCS using soft systems methodology so as to capture Kith 'soft' and 'hard' issues that would influence development ofa social informatics svstcm. Iliough the soil issues will he unique for NC'GCS. there are some aspects of the requirements that arc true lor other societies. I his is because other societies have similar settings and are controlled under the same legislation. I he study w ill be useful to scholars who can refer to the conclusions as a guideline for similar studies. The study will enhance understanding of one of the critical phases in the information systems development process This will further enrich the body of knowledge of the Information Management discipline One of the major locus ol the objectives is for instance to ensure that the actual model ol requirements analysis will result in an unambiguous definition of a cooperative IS requirements to ensure successful implementation.

Specifically, the study w ill be of importance to:

(i) Acadcmia and rcscarchcrs as a basis lor future empirical and conceptual research, which will be helpful in refining and validating findings.

(ii) It will be significant to the business community, especially to business managers and Information Systems experts who are involved in developing Members and Management Information Systems

(iii) Policy makers who need to appreciate operations and challenges ot cooperatives lo suggest suitable policy guidelines for the development and management of a Cooperative IS sy stem.

Chapter 2. LITERATURE REV IEW

t | Information Management

jslaijar (2002). Mates that in today's highly technological world, information in an organization is as important, if not more important, than other assets. Ihe systems and resources processing such information arc also of major importance. Secondly. Information Communication technology <UT) Systems have gradually taken over decision-making responsibilities from human beings. Increased volumes, changing technology and widening expertise may lead to risks such as loss of data due 10 accidents, deliberate intervention, loss of confidentiality due to insecure access io information, high cost of recovery in case of breakdowns, inefficient acquisition and development of software applications, inelftcicnt use of ICT systems due to lack of' training, business interruption, loss of information integrity. ICT units are then under a major pressure to ensure the success of (heir systems and processes.

In addition, there is recognition that nil aspects of Information Management as delineated by various authors (Wilson. 1994: Synoti and (iniher. 1981; Schneyman. 19X5; Morton and Pruden. 1988; Choo, IW5; lt> theway, 2004) must I>e grounded in a consideration of the information requirements (oi Information needs); which is die subject matter of requirements engineering.

2.2 Requirements Fn»ineeriiiu

M Kauppinen et al (200-1) define, requirements engineering (Rl) as the science and discipline concerned with analyzing and documenting requirements In other words. Rl process means those requirements for a system arc defined, managed and tested sy stematically I he purpose of RE is to ensure that a product development team builds a system that satisfies customer and user needs. From the perspective of software engineering (SI). RE is the first activity of die software

development process, and u is intended to establish what services arc required Irom the system and ihe constraints on the system's operation and development. User involvement is critical for two reasons. lirst. it helps to develop a process tfiat is useful to the people that have to execute this process. Second, involvement increases the acceptance of the developed process.

for many researchers, particularly those with computing science backgrounds. ISD mainly represents the dual activities of analyzing business systems and designing computerized information systems that support them. I his starts with systems analysis and ends with programming (and may never look outside these tasks). Such technical accounts of IS|) are usually based on linear process models such as ihe systems development lifecyclc (SDI.C) or the waterfall model, which presuppose that development can be organized in a set of time-delineated sieps. which are consequent upon each other. 'Systems development encompasses the complete range oi activities involved in the process ol building (including both analysis and design), implementing and maintaining an information system' (Hirschhcim *etui* 1995).

Lyytincn (19X7) observes that ii is here taken as axiomatic that analysis and design cannot be separated from their social contexts for the purpose ol study, and that all social factors that impinge on development are worthy of study, with appropriate research methods. Systems development should be taken to lie a 'multidimensional social change'. It follows that ISI) includes 'cultural, social, political and moral aspects that pertain to the choice, development, implementation and evaluation of computerized information systems[1].

O 'Brien (1993) defines requirements engineering as an in-depth study of end user information needs which produces functional requirements that arc used as a basis for the design tit a new *><«cm I unctional requirements are end user information requirements that arc not tied to the hardware, software and people resources that users use, User interface requirements arc input/output

need* ofend users including sources, formats, content, volume, frequency. Processing requirements arc activities required to convert input into output. It includes calculations, decision rules, and other processing activities. Storage requirements determine the organization content and size of database*, types and frequency of updating inquiries, length and rationale of record retention. Control requirements check accuracy, validity, safety, security, adaptability requirements for system input, processing, output and storage functions.

the Standish Group (1995) considers incomplete user requirements as one 01 the top factors for Information Systems Project failure. However, it may not be sufficient lo conclude that the above four dimensions are reflective of all the user requirements.

A successful requirements definition proccss as Koltzblan and lleycr (1995) concluded are alxwit people talking effectively to each other. I he process ol requirement gathering has more lo do with people's ability lo cooperate and modify how they work than any other factor. Chcckland I l')XI) states thai because of involvement and necessity of mutual control of the proccss by all the players, requirements dictation is a difficult and imprecise process.

Brooks (1987) say* thai research has concluded that no part of the information system development proccss so cripples the resulting system if done wrong and that no part is more difficult lo rectify later as requirements determination. This implies that close interaction between the developer and users makes the developer familiar with the business and users familiar with technology Transfer of users' understanding and insight of business will translate Into a working computer. Research on the role of user developer communication has revealed that the transfer of users understanding anil msighi to business practice to developers who will translate into an effective working computer system which is the key to eflective communication benefiting both parties. Bottom < 1 *~8<> argues that participants bring different frames of reference to the situation and the ability to integrate these

g views into a shared, accurate and complete model of the desired system Is essential to ,slul projects. I he analyst has a complex problem of meeting customer and designer needs

Most observer* agree that many errors in developed systems arc directly identified to poor requirements definition. Industry statistics suggest that 56% of systems problems are based on poor requirements definition as opposed to 7% caused by poor coding, In the maintenance arena 82% ol the efforts are due to poor requirements as opposed to 1% for poor coding. Many information s\ stems failure have been attributed to incomplete and inaccurate information requirements I hat means to develop effective information systems today we must take the lime to integrate the technical aspects of information technology and the social aspects of the organization. Further, conventional systems analysis has largely focused on defining information processing requirements rather than looking at information technology from a wider perspective that is social technical approach in which the system is viewed as a whole placing it within a broad operation* environment with the user as an integral part of the system. Requirements cannot be fully separated from their social organization context.

I he debate as witnessed not only in industry but also in academia firmly recognizes that requirements analysis, as an activity within the Information Systems Development is a complex issue, requiring new ways of solving the problems associated with it. The proposition then, according to authors such as AckofT (1981, 1999) with regard to complex issues is the need to develop "resilient systems" with the emphasis that the traditional thinking about problem solutions to be avoided. I here are also assertions that in the requirements analy sis process, the problems encountered arc not only structured, but also includes unstructured elements. Mitroft (I99«)j therefore suggests a sy stemic inquiry, basically designed to assist in unambiguously understanding of the "messes" inherent in the requirements analysis process within the turbulent environment of cooperative.

Debate* on requirements analysis that have been raging over the decades recognize the problems associated with the process liaccarini ct al, (2004). It is therefore not difficult to depict this process a complex issue and therefore a problem, which still remains unresolved. A systemic approach ought to be adopted in an attempt to resolve this problem system in a "holistic" manner. Keating ct al <2(H) I) suggest that there are two critical points to be considered concerning complex problem solving: Problems cannot be isolated from the system that is producing the problematic behavior and the problem system cannot be understiKtd independently from the context within which it is embedded

Iherefore the focus ot this study is to understand the requirements engineering process, as a problem system, within the context of a Co operative. It is in this context that the concept of Cooperative Information Systems (CIS) has been considered as fundamentally different type of information system, clearly influenced by the turbulence within the cooperative domain.

I he processes of information systems development, especially the domain of requirements management is still subject to contention and a lot ot debate m the information management community Gladden. (1«>82); Itrooks, (1987). An understating of the debate from the Systems Development Life Cycle (SDLC) may suffice, simply because many of the other ISI) methodologies (planning approaches, participative approaches, prototyping, and e I.e.), more or less follow the triidition.il waterfall model to ISI). In many cases, requirements, as determined in the SDLC, act as the unalterable blueprint of the new system Walters ct al. (1994). Requirements of a system are a deliverable of the requirements analysis process. Once defined or specified, the user S'gns them off. before the process of design can begin. It is these requirements and their definition that arc at the heart ni the problems with the traditional SDLC and other ISI) methodologies * alters et al. (1994); W ilson. (1994); Kirk. (1909).

2j Soft Sy*len»s Methodology

IHis study will use soft systems methodology lor requirements engineering which is an action research approach Action research is u research methodology that combines theory and practice through change and reflection. (Rapoport, 1970. Ilult and I cnnung, 1978. Susman and I \cred. I<)7#) It helps in practical problem solving, expands scientific knowledge enhances actor competencies. Uses data feedback in a cyclical process, aims at an increased understanding of a given social situation. It is used to empower users and improve developer's skills. Action learning simultaneously assists in practical problem solving and expands scientific knowledge through direct involvement in organization change that can also result in better future decision* and actions Action research is concerned to enlarge the stock of know ledge of the social science community . It is this aspect of action research that distinguishes it from applied social scicncc.

SSM provides a window through which the complexity of human interaction can be investigated, described and hopefully understood. Once an understanding of the situation under study has been achieved then the methodology allows the identification of changes that are Kith systcmically desirable (in thai it will alleviate some ot ihe problems and issues) and culturally feasible (in that actors within the system will be inclined to engage with the changes proposed and Ihe change process itself)- SSM encourages learning and understanding, which will hopefully lead to agreed change and the resolution of problems.

Khosrow-Pour. (201)7). article argues that the reason for failures of previous attempts of system designs are because the existing situation of concern was not captured well through a well-delincd and acceptable human activity system that look into consideration the major issues identified by the Stakeholders llencc. there was no starting point to begin thinking about better implementation of formation systems to serve the production process

Mingcrs 41995. p 19), along with other researchers, argues that related types of failures can ultimately be seen as failures in expectation, that is. the final information system docs not in some wav meet the legitimate expectations of the stakeholders. Mingcrx further states that

Information system failures ultimately occur as a result of the limitations in conventional (hard) information system analysis and design methodologies. Traditional approaches to information systems design have been attracting a considerable amount ol criticism recently bccausc of their lack of attention to sociul. political, and cultural issues. SSM provides lor consideration of these factors.

According to Checkland (1991) and Ngwcnyama (1991). the most unique aspect of SSM is in its iterative process ol problem diagnosis, action intervention, and rcflcctivc learning by the researcher ami participants Within an IS context, Checkland (IWI) suggests the need to include an intellectual framework (thus the theoretical basis below) to guide the effort, and to clarify such methodological details as the role of the researcher, the process of problem diagnosis, the nature of the intervention, the extent of reflection and learning intended, and whether there is new know ledge to he gained.

In addiion. Checkland (1991) also proposes a structure that should be adopted when undertaking SSM based on a number ofcriteria I ike there should he a real-world problem relevant to research themes ot interest to the researcher. Within the purview of this study, this shall l»e a specific case study currently intending to develop a cooperative information system.

I he respective roles of the researcher and participants are defined in the problem situation. I his shall he clarified during the research process, since it is part of the learning process inclusion ol an intellectual framework, by means of which the nature of research lessons can be defined and the

method in which the framework is embodied. Rcscarchcr involvement in unfolding the situation with a view to help bring about changes deemed improvements. I he experience of the rcscarchcr mil only as an academic within the IS Held but also as a consultant in the particular research problem will be invaluable. Rethinking of earlier stages by making sense of the accumulating experience through the declared framework and method, and revising changcs: and point of exit lor the rcscarchcr in order to review the cxpcricnce and to extract lessons for learning in relation to the research themes and or definition ot new themes.

While use of SSM offers important opportunities for exploration and learning it unfortunately leads to a number of pitfalls Baskcrville and Wood-Harper (1996) have summarized these as: lack ol impartiality of the rcscarchcr. lack of discipline, mistaken tor consulting; and context-dependent) leading to difficulty ol generalizing findings.

Hard problems are problems characterized by the fact that they can he well defined. You assume that then.' is u definite solution and you can define a number of specific goals that must he accomplished. In essence, with a hard problem you can define what success will look like prior lo embarking on implementing the solution The "WHAT" and the "HOW" of a hard problem can be determined early on in the methodology.

Soft problems, on lite other hand, are difficult to define. 'Ihey will have a large social and political component When we think of soft problems, we don't think of problems but of problem situations. Wc know that things are not working the way we want them to and we want to find out why and \ec 'I there is anything we can do about it. It is the classic situation ot n not being a "problem" but an I "opportunity".

Keating et al (2001) recognizes that for organizations to be effective it needs to develop for complex issues, especially il the environment is turbulent. I he turbulence in lite co-operative context is undeniable with its characteristic environmental turbulence seen in scarcity of resources, rapid and costly technology advances, continuous shifts in customer expectations and very dynamic workforce (Bolman and Deal. 1997). There arc all indications that organizations operating within this environment will continue to face increasing turbulence with the attendant challenge that organizational leaders' need to be adequately prepared to solve problems posed by the env ironment.

SSM is divided into seven distinct stages.

Ihcsc are:

Stage I: finding out about the problem situation I his is basic research into the problem area. Who arc the key players? How does the process work now'.'

Stage 2: Expressing the problem situation through rich pictures. As with any type ol diagram, more knowledge can be communicated visually. A picturc is worth a 1.000 words.

The problem owner's help is the input of the process. The problem solver will perform analysis on the soft system and end up with a rich picture as output of this transformation process. The analyst will use the rich picture to aid their communication with the problem owner. In addition, he or she will notify the conflict he observes on personnel or function I he rich picture is used to identily problems and inform the problem owner of the situation rather than provide possible soluti«H>.

Stage 3: Root definitions - Naming of the Relevant Systems Selecting how to view the situation and producing root definitions. Fa»m what different perspectives can we look at this problem situation'.' It is necessary to pay closc attention to the formulation of names of relevant systems, and k> write them in a way such that a model could be built based on these names. Iliese names arc known as Root Definitions. I he purpose of the root definition is to express the core purjnisc ol some purposeful activity system. It is important that attention is paid into the development of root

definitions. Properly written root definitions provide a much simpler insight into building system models. Root definition names:

Customer everyone who stands to gain from a system is considered as a customer of the system. If the system involves sacrifices such as lay oil's, then those victims must also be counted as customers.

Actor: I lie actors perform the activities defined in the system.

transformation process: I his is shown as the conversion of input to output.

Weltanschauung: The German expression for worldvicw. This worldview- makes the transformation process meaningful in context.

Owner I very system has some proprietor, who has the power to start up and shut down the system

Environmental constraints: Lxtcmal elements exist outside the system which ii takes as given. These constraint* include organizational policies as well as legal and ethical matters.

Stage 4 liuilding conceptual models of what the system must do for each root definitions. You have basic "W hats" from the root delinilions. Now begin to define "Mows".

During this stage formal system thinking is applied to the development of the conceptual model. Hie formal System Model serves as a guideline for checking the conceptual model we draw. Let S represent a human activity system. Under the Formal System model. S is a formal system if and only if ii meets the following criteria:

S must have some mission,

s must have a measure of performance

S must have a decision making process

S must have components, which interact with each other such that the effects and actions are transmitted through the system.

S must He part ol a wider system with which it interacts.

S must be bounded from the wider system, based on the area where its decision making process has power to enforce an action.

S must have resources at the disposal of its decision making process.

S must either have long-term stability, or the ability to recover in event ol a disturbance.

Stage 5. Comparison of the conceptual models with the real world. Compare the results from steps I and *2* and see where they differ and arc similar.

Stage 6- Identify feasible and desirable changes. Are there ways ot improving the situation?

Stage 7: Recommendations tor taking action to improve the problem situation. How would you implement the changes from step 6?

SSM has been under criticism for lack of theoretical rigor and practical value since its inception Compared with classic ISI) methodology. SSM is less tangible and more difficult to explain and use I his inevitably limits its opportunity to be adopted in practice. Moreover, the >up|K«ters ol SSM often object to applying explicit, measurable evaluative criteria to assess the success of SSM.

I he following comments by C heckland best represent their views on attempts to evaluate the success of SSM If someone says to me. I have tried the methodology and it works, I have to reply on the lines: Mow do you know that better results might not have been obtained by an ad hoc approach ' If. on the other hand, the assertion is: Vour methodology does not work. I may reply, ungraciously but with logic. How do you know the poor results were not due simply to your incompetence in using it? W hile these arguments make perfect sense logically, following such logic nttt) lead SSM into a dead end.

Unfortunately, many SSM advocators have chosen to stick to this path. I hey cicatc a public image of SSM as an amorphous philosophy concept by presenting the soft sy stem methodology in an ambiguous manner. I hey always elaborate on why SSM makes sense but seldom discuss the barriers to implementing SSM in system analysis practice I hey attack traditional system analysis methodologies as narrow-minded and near-sighted and claim SSM as the best system analysis approach based on their belief, without giving sufficient empirical evidence to support their conclusions.

The value of SSM lies in its recognition of the importance of human'soll factors in organizational and social systems, the multifaceted nature of system rationality, and the role of incremental learning. I he objective of SSM should be to provide mechanisms to better capture and explicitly incorporate these elusive elements in the system analysis process rather than to dismantle the process structure oll'ered by other system analysis methodologies. It Is a rigorous tool to use in "messy" problems. Two unspoken assumptions of structured methods that come under fire from these challenges are that there is a well-defined problem to be solved and that social, political and cultural factors are inconsequential.

SSM can play a useful pait in problemati/ation clarifying and prioritizing unclear situations. Social theory might play a useful part in sensitizing information system development to social, political and cultural issues. I he main SSM pitfalls are that it requires from participants to adapt to the overall approach. I here is a risk of narrowing the scope of the investigation too early li i> difficult to assemble the richest picture, without imposing a particular structure and solution on problem situation. People have difficulties to interpret the world in the loose way. I hey often show an over-urgent desire for action.

Assumptions ol the Sot) Systems Methodology arc that it assumes thai most management ami Ofguni/aliomil problems cannot be seen as pure "systems problems" us the system is far loo complex to analyze. Nevertheless applying a systemic approach in a non-systemic situation is valuable.

["he mode of analysis will IK: through use of hermeneutics. I lie basic question in hermeneutics is: what is the meaning of this text? Kadnit/ky (1970). I ay lor (l«J76) says that interpretation, in the sense relevant to hermeneutics, is an attempt to make clear, to make sense ol an object of study. This object must, therefore, he a text, or a text-analogue, which in some way is confused, incomplete, cloudy, and seemingly contradictory - in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense.

I he users and issues to be addressed during cooperative information system development are ill delined This study will use sol) systems methodology lo define the system and its requirement. Hermeneutics approach will be the mode of analysis so as to refine the users' perception to derive a requirements for a co-operative information system.

2.4 Social Infoi unities

Klinp (2001a) say s that SI includes studies and other analyses that arc labeled as social impacts of computing, social analysis of computing, studies of computer-mediate communication (CMC). information policy, 'computers and society." organizational informatics, interpretive inlormatics. and so OIL SI sets agendas for all the technical work in two ways, first by drawing attention to functionalities that people value, thus setting priorities for design and implementation; and second by articulating those analytical categories that have been found useful in describing social reality . anj that which therefore should also define technical work.

Carroll. J M and Rosson. M B. (2006) observe thai participatory design integrates two radical propositions about design. I he first is the *moral* proposition that the people whose activity and experiences will ultimately be affcctcd most directly by a design outcome ought to have a substantive say in what that outcome is. Hie moral proposition is that users have a right to be directly included in the process of design. Ihe second is the *pragma/ic* proposition that the people who will need to adopt, and perhaps to adapt to an artifact or other outcome ol design, should he included in the design process, so thai they can offer expert perspectives and preferences regarding the activity thai the design w ill support, and most likely transform.

The pragmatic proposition is that dircctly including the users' input will increase the chances ot a successful design outcome. Ihesc propositions are radical because they fundamentally challenge conceptions ol design as a profession and of what il means to IK a designer. I bus, it might seem purely definitional that the people who shape designed artifacts and systems arc the designers. But in participatory design, the designer's role is more nuanced and more complcx. Ideally, all the relevant stakeholders participate in even the inner loop of design conception, and all continue to participate meaningfully as the design is specified, implemented, delivered, installed, and used.

I hey further slate that participatory design process becomes a social negotiation among partners, and the designer's responsibility in this process is to faithfully translate, collaborate, and respond to the concerns ot the other stakeholders. Some designers might not want this job description?

However, community groups need to have more control of their own information technology because the technology represents their group to the larger community , bccausc il shapes what the group can accomplish within the larger community, and because they actually do know a lot about what they need and are able to participate effectively in designing it.

Bc> oitti the moral requirement for direct participation, the complex requirements of community computing reinforce a pragmatic argument for participatory methods Carroll ami Rosson, (2001, 2003). The user population is diverse, ranging from young children playing educational games at a museum to elderly shut-in citizens sending email to loved ones. This makes it very difficult for outsiders to anticipate the needs of the target users. I he technical infrastructure tor community computing is also diverse and difficult to assess without direct involvement ol households, community buildings and other locals for community interaction, When task-oriented activities are involved (e.g.. organizing for u blood drive), it is often difficult to predict just who will *how up and for how long, what expertise will he present, and what tasks will even he possible at all. Often the same individual plays multiple roles across the community <e.g. a mother is also manager ot a bank, (i member of a church, an otlicer in the historical society), and may even leverage interactions across these gioups in subtle but ini|>oil4iit ways.

Community groups rely on volunteer effort and intrinsic motivation, the supporting technology must be as cost-free as possible so that individuals can get on with their real goals of helping one another.

Irom the pragmatic perspective, an important contrast between workplace and community informatics is the absence of *us' and "them" No one is 'boss' in n community. most initiative Ik«>WN boiu>m-up Success and failure in community informatics initiatives typically depend on individual initiative taking. Yet the conscqucnccs are more immediately tangible than business plans and stock trajectories.

Ihe community experiences technology initiative outcomes directly through the needs of its constituents In this paradigm, a successful outcome is akin to self-actuali/ation the community

inhabits, owns and controls its technology or it tails to. Hut if it fails, there is no manager to redress the failure: instead the community simply exists at a lower le\cl of collcctivc human development

Community organizations vary along many dimensions: goals, si/c. structure, leadership, knowledge, financial and other physical resources, visibility w ithin the community, and so on. Ihus it is impossible to develop a generic solution for their 11 needs: each ease is different and requires its own analysis process. When an external agent makes this analysis, important pieces of the organizational context may be missed. For instance, one of our partners worked through a difficult episode with a web designer who had ereatcd a modern and attractive website for the group: in the process he had also taken responsibility for the organization's web information content Unfortunately the designer had misconstrued the group's mission, leading to considerable discontent within the group about their web identity. I he group was helped to articulate the source of their frustration and to commit to taking over control of their web site's design and content.

Participatory design in community informatics. Carroll ct al (2tM»7) conclude by noting ilnit participatory design has become a key tool in enabling such ambitious goals: The 'users" that is. the people who stand to have their activity and experience transformed, ought to have a direct say and a meaningful role in how ili.it comes to pass at the very least because they know a lot about what is precious and what is annoying in their current activity and experience, but equally because they are morally entitled to have a say in anything that might change everything.

Kohen Solow (1987) wrote, "you can see the computer age everywhere bin in the productivity statistics. Solow's assertion counters common assumption that computerization would directly and dramatieall) improve productivity. The explanations lor the productivity paradox. Many organizations develop sy stems in ways that lead to a large fraction of implementation failures. I cw

I plantations design systems that effectively facilitate people's work. We significantly underestimate how much skilled work is required to extract value from computerized systems.

Resolving the productivity paradox lies in the future. The productivity paradox gives us reason to believe that current strategics of computerization do not readily produce expected economic and social benefit in vast number of eases. In particular technology alone even good technology is not sufficient to create social and economic value. I his implies thai effective computerization depends upon close attention to workplace organization and practices As a design practice, u socio technical approach required discovery process that helps designers to effectively understand the relevant life worlds and work worlds of the people who will use their systems It is therefore important that information system design be looked at from a wide perspective, be seen as a continuous process Willi no distinction between requirements and design and above all social technical issues be taken into account.

2.5 Agricultural Marketing Societies

W ith the introduction of market liberalization reforms in the early 1980s, the government began lo realize that primary agricultural co-operative societies would have lo be given more business decision-making autonomy to compete in these markets. The Cooperative Societies Act of 1997 was an effort lo creatc a more favorable legal environment that would accomplish this by reducing government's role in regulating, financing and managing these co-operatives.

findings from a 1997 studv on member capital formation in live large coffee and dairy co-operatives m Kenya confirm these trends. In the surveyed co-operatives neither managers nor nicmbers showed great interest in mobilizing additional member equity capital to finance business growth ciiher through the accumulation of retained earnings or through additional member equity capital contributions. One reason cited was that both co-op managers and members lack access to

jhc kunl of detailed and timely information on member transactions, co-op financial position and profitability needed to implement such member capitalization schemes

Surprisingly, all the surveyed co-operatives still operated using manual bookkeeping systems. I his led to long delays in member transaction and financial reporting, lack of information sharing ami transparency between management and members as to the financial state and profitability ol the co-operative. weak member participation, and consequently a low level of member capital contributions to finance co-operative business activities, (httpy.'www coopworks or^; June 20<)X>

T)W introduction of modem information and communications technologies tIC'Ts) in cooperatives can significantly improve results. I hey can facilitate the collection, analysis, storage and reporting of information much taster and more accurately than could be accomplished using manual systems. Computerization also can help cooperative managers streamline opeiations, cut operating costs, enlarge their networks of members and affiliated institutions, increase sales and respond to signals from far away markets. Connecting lo the global network of the Internet also has its advantages, allowing taster communication with members, panncrs and clients at a fraction ot the cost.

A coffee cooperative s»iciety therefore consists of coffee growers who have joined together to bulk, process, collectively transport for milling and marketing and thereafter be paid net of costs Being a member of the cooperative is beneficial since the primary processing is too expensive and uneconomical tor each individual to do alone.

The Ministry of Co-operative Development A Marketing Strategic Plan, (2004-21MH) revised 2IHI6. recognizes that the Cooperative movement plays a major role in the democratization ot capital It quotes that the cooperative movement contributes over .11 percent of the country 's national savings •he sector has mobilized over kslis. 110 billion in domestic savings, lip lo 63% of the country's

population also derive their livelihood, in one way or another from the movement. In view ol .ill these. the importance of the movement in the goal of sustained economic growth for employment jnj wealth creation cannot be over emphasized However, the above capacity of the movement. ^Specially the cooperators savings, has over the years been susceptible to corrupt deals by crooked movement leaders and managers. This had led to a systematic decline in the activities and overall performance of cooperatives.

Kydd (2tM)2) notes that commercialization of the agricultural sector requires producers to luve access to the necessary tools to assess competitiveness between different enterprises and technological options for the various fanning systems, in order to make informed decisions. Successful and sustainable increased production of the small-scale farming sector also depends on systematic decision support services and a widespread information system on market opportunities, l ack of information has often led to market failure and exclusion of smallholders from the opportunities presented by globalization.

Minae (2001) observes that currently farm data systems in sub-Suharan Africa comprise fragmented and disjointed multi-source systems that display serious data gaps and poor co-ordination in data collection, analysis, utilization and dissemination. I he array of institutions involved in farm data tends to maintain individual data sets and there are very limited efforts to set up common data frames or to harmonize data sets. Held methodologies and analysis or data storage facilities, 'there is poor synthesis and presentation of data in formats that could be easily accessed and utilized by small-scalc farmers.

The immediate advantage that computerization brings is the enhanced ability to handle large amounts of information. The introduction of modern information and communications technologies (KTs) in cooperatives can significantly improve results: they can facilitate the collection, analy sis.

storage and reporting of information much faster and more accurately than could be accomplished using manual systems. Computerization also can help cooperative managers streamline operations, cut operating costs, enlarge their networks of members and affiliated institutions, increase sales and respond to signals from far away markets Connecting to the global network of the Internet also has its advantages, allowing faster communication with members, partners and clients at a fraction of the cost.

Further http coopw.irks.oru.' June 2008) website observes that tlie United Nations, the International l abour Organization and the European Union ha\e taken a positive attitude towards co-operation I his is because they see a co operative as an entrepreneurial model offering additional options to society compared to other forms of entreprcneurship. Co-operation shares common values and resulting features, which arc reflected in business activities in practice. On the other hand, responsible co-operation also means keeping up viability and profitability, why co-opcratives. from ihc operational side, have begun to resemble other companies. Adaptation to various market situations has shown that the co-operatives arc able to operate using competitive means similar to those used by limited companies. It is considered to promote economic success, occupational well-being. lair globali/ation. economic competitiveness and rural development

I he I \ Secretary•< icueral Han ki-moon who refers to CoopWorks in his report to General Assembly where he submitted the report Cooperatives in social development lo sixty-second session of ihc General Assembly focusing on the role of cooperatives in promoting full and productive employment. I he report refers to I-AO activities on computerization of agricultural cooperatives and specilkaIly lo the CoopWorks project, stating in the paragraph 75 that within the framework of its recent work with cooperatives. I AO has placed |>articular emphasis on the Computerization of agricultural cooperatives. Computerization is seen as a way to improve cooperative business management, administration and governance.

However cooperatives have many constraints including comply ing w ith guidelines or circulars from the Commissioner of Cooperatives. At the board level the cooperatives elected board members ate frequently non-professional volunteers, yet the) assume highly technical responsibilities such as loan analysis and disbursement, budgeting and financial expenditure control. At the member level tlicy may force the board to implement issues in a manner that abuses the spirit of good governance. At the stall level, due to members* unwillingness to offer competitive salaries they are not able to attract and retain professional staff.

Ii is paramount therefore that the IS system design and implementation takes cognizance of this and build consensus among all the stakeholders for success, l or example members should be empowered on the usefulness and benefits of the system otherwise the investment may not be fully utilized.

Social informatics emphasizes that technology alone even good technology is not sufficient to create social or economic value Ibis implies that effective computerization depends upon close attention to workplace organization and practices.

In the NCGCS case, there are very many interested parties hence the need to rigorously go through the requirements determination process. Besides this being a relatively new area of computerization the requirements may not be easily defined

Chapter 3. RESEARCH METHODOLOGY

j l The Research Design

I his was a requirements engineering study tor a member and management information system for a coffee cooperative the case of NCGCS. In addition the study documented challenges in the requirements analysis pioccss for a social Infonnatics system. I lie research methodology adopted was soft systems methodology (SSM). SSM is considered appropriate when the problem is ill defined and complex. However the researcher in addiiion reviewed the society existing member management information system and conducted follow up interviews with stakeholders to appreciate the society situation better Therefore besides organizing two stakeholder workshops, she conducted follow up interviews and studied the existing member management information system.

SSM was thought useful in propositions of how to address complex problems that are vaguel) defined. It is appropriate especially on linking research with practical scenarios since it involves participation in clients' projects and academic rellection in order to analyze and learn from the participation. I his methodology also provides an opportunity lor the system designer to be responsive to the user needs as well as lake into account soil issues like the political environment, social and organization structure, cultural factors and system environment.

As detailed in the literature review, many system failures and low utilization issues emanate from focus on the technological solution other than provision lor support of user participation. Low user participation and little consideration of other factors allecting the use of the system like the cultural, vocial and political issues. Participatory design where one needs to include users in the design is Accessary so that they can give their expert perspective, preferences and own the sy stem

3.2 Data Collection

I be study commenced with the rcscarchcr writing to the society chairman seeking an appointment. The appointment was granted. During the meeting, they were given a brief on the project and the specific support required from them. Specifically they were to assist in organizing the stakeholder workshop. They advised it would be better to make the stakeholder workshop coincidc with the scheduled management committee meeting. 1 his is because each time the management committee is summoned Ihey must be paid allowances. The researcher was informed that the next scheduled management committee meeting was in two weeks.

Stakeholder workshops were the primary data collection methods Follow up inters iews. and review ol the existing system was to validate the findings from the stakeholder workshops and obtain a belter understanding ot the cooperative member management information system. The researcher observed the manual system interaction with users to appreciate the system environment, observe lasks performed, and tools employed, interaction between people/systems, users capability and attitude to change

Establishing rapport was easy as the researcher had a working the relationship with ihe \(ti(s members. Ihey were therefore very supportive and cooperative in providing the necessary information. Ihe researcher also had a good understanding of the society and its operations.

I he Cooperative Act was reviewed to appreciate the socictv legal environment Ihe Ministry ot Cooperatives Development and Marketing strategic plan was reviewed to appreciate the government position and strategy for cooperative societies.

The first stakeholder workshop was with representatives from the management committee and the Uu representative: the next was with the chairman, secretary- manager and bookkeeper. Contact was a|y> made with the Ministry of Cooperative Development & Marketing District Cooperative Officer to provide the government guideline on member information management.

While SSM promotes ownership and highlights the "soli' issues it is largely critiqued due to the luck ot impartiality of the rescarchcr. While the researcher's role was to guide lite discussions, influence on the stakeholders cannot be ruled out. This may the raise the question of whether the recommendations are 'owned' by the society or arc they the researcher's ideas pushed on them. I he voeietv also seemed to mistake the exercise tor consulting especially becausc ol the relationship with the researcher. I he findings arc context dependent as the views and opinions ol the N('(i(S stakeholders may not be those of other cooperatives thus it is difficult to generalize the findings.

Chapter 4. DATA ANALYSIS AND FINDINGS

4,| Introduction

Ihis chapter presents the results of the analysis and findings of the study. I he study was for fequiremcnts engineering for a Member Management Information System using soft sy stems methodology I his was used premised on the social construction paradigm

[his was a qualitative research. The mode of analysis adopted was hcrmcncutics. Hcrmcncutics is primarily concerned with the meaning of a text or text-analogue (an example of a text-analogue is un organization, which the researcher comes to understand through oral or written text).

When hermcncutic analysis is used, the object of the interpretive effort becomcs one of attempting to make sense ol the organization as a text-analogue. In an organization, people (e.g. different stakeholders K an have confused, incomplete, cloudy and contradictory views on many issues. I lie aim of the hcrmencutic analysis becomes one of trying to make sense of the whole, and the relationship between people, the organization, and information technology.

Note, although a clear distinction between data gathering and data analysis is commonly made in quantitative research, such a distinction is problematic for many qualitative researchers. For example, from a hcrmencutic perspective it is assumed that the researcher's presuppositions affect the gathering of the data - the questions posed to informants largely determine what you are going to find out. The analy sis affects the data and the data affect the analysis in significant w av s.

Therefore it is perhaps more accurate to speak of "modes of analysis" rather than "data analysis" in qualitative research Ihese modes of analysis are different approaches to gathering, analyzing and

interpreting qualitative data. I he common thread is that all qualitative modes of analysis arc concerned primarily with textual analysis (whether verbal or written)

The studv sort to understand the management and members attitudes and belief on adoption and use of information technology including use of internet and automation of member management information systems adoption of new technology depends on awareness of problems and organizational culture that encourage risk-taking, political factors which introduce the concept of multiple objectives, held by different interest groups or stakeholders.

l'hc re scare her obtained the bulk of the Information during the stakeholder workshops. In addition follow up interviews were conducted especially with society employees to clarify issues, and to gain a better understanding of the society, its operations and future strateg). Review of system reports and legal guidelines like Cooperatives Act <2(MM) was done to appreciate the socicty legal environment. Kcports too were reviewed.

4.2 \C(,TS Requirements Engineerinu "$inj; Soft Systems Methodology (SS\1)

The society requirements determination was done using SSM. SSM is divided into seven stages. During the first stage a current system description is obtained. During stage two. rich pictures are developed, During stage three, a root definition is developed identifying the system customers, actors, define the transformation piocess. define the Weltanschauung (worldvicw). identify owners and analyze the organization environment. Stage four involves building a conccplual model, A conceptual model is developed identify ing opportunities for improvement. During stage live the conceptual model is compared with the real life situation. I hat is stage tour compared with stage two. During stage six feasible and desirable changes are identified and during stage seven recommendations for taking action to improve the problem situation is made Ideally ilie process should IK iterated uutil a fairly optimal information system requirement is determined

["hough two stakeholder workshops were conducted between the management committee and the employees the information gathered was combined so as to generate the detailed organization description and extract organization rich pictures

Poring the hoth stakeholder workshops, the researcher highlighted broadly, the purpose of the study and outcome, further, the researcher explained to the participants the research methodology Ihe researcher Inid to be as simple as possible avoiding use of technical terminology so us to be able to communicate. This is because the audience was mixed. Some of the committee members have minimal formal education. The researcher also detailed their role where it was explained to them that they were expected to provide background on the society, give an account of their interaction with the system, their expectation of what the sy stem should do lor them and whether the current system meets their needs. Further, they were expected to make recommendations from their perspective on what needs to he done to improve.

A programme giving an agenda for discussion had been developed. During the discussions, the researcher led the discussion and took notes. Fach of the participants had an opportunity to introduce themselves and explain their role. I hey were also expected to indicate their knowledge of It I and level ol use of IL I.

Finally, they were expected to give an opinion as to whether they thought computerization is good and what advantages they thought they would derive from it. I ach was expected to highlight the challenges tlvcy experience or the bottlenecks they experienced extracting the information they require.

4.2.1 SSM stage (1) current system description.

From workshops, the researcher was able to understand when, why the society was formed, who arc »s members what benefits they derive being members, challenges they experience and

improvements that they recommend. I he participants being representatives of different constituents were expected to articulate concerns of their constituents.

Membership

It was established that the society was registered in the sixties It has 2.500 registered members but currently only 2.000 are active, The active members arc fewer than the registered because with liberalization, poor society management, and poor marketing practices, coffee priccs declined I he society has three pulping stations namely. Ngaita. Ndumbcri and Kiabui. Most ol the members arc men. This is because culturally Ihe men own the land and thus will be the automatic cooperative society member There arc few female members who mostly are members by virtue of the fact that their husband may have passed on and they are the heirs. Membership also changes when the old men subdivide their land Each member is expected to buy shares and pay a membership Ice on admission to the society. They indicated that more than filly percent are semi literate while ninety pcaent arc computer illiterate. Over fifty percent of the members are over forty years of age. All the comminec members are over 4<i years old On the other hand, women are the majority of the workers who pick cottee.

Most besides coffee growing engage in other subsistence farming like dairy cattle rearing. I hey are alio involved in other business activities. I his partly explains why coffee production has declined in recent years. When the colTee prices had significantly reduced they could easily substitute the colice income

liencliis of being a society member

Ilk* stakeholders explained that they needed to he members ol the society because I hey need to pulp ami market the coiTcc and they do not have such facilities as individuals. In addition they arc able to access picking advance, school fees advances, loans from Cooperative Bank and other farmer

lending institutions as the society acts as guarantor and will recover the money dircctly firom the deliveries. They noted thai to access coffee development funds they must form groups to cross guarantee each other. They think that it is henetieinl to market together as they think it would he too expensive to attempt to market individually. In addition, as members of the society they are advanced inputs. I his enables them lo tend lo their farms then they pay later. I he chairman also mentioned that they enjoy quantity discounts as they purchase in bulk. I hey also noted that since colTec is sold in dollars, they felt more comfortable if one of their exposed members could handle ihc exchange rates negotiation with banks after sale of coffee Generally they believe the coopcralion improves each member's situation. I hey have shared values being persons svith common interests.

Political env ironment

A management commillcc Comprising of nine elected officials manages the cooperative on behalf of members. The committee comprises of the Chairman, the Vice Chairman. Secretary. Treasurer and five committee members a total of nine members There is a supervisory committee comprising of a chairman, secretary and a committee member a total of three members. Ihc supervisory commillcc role is lo act as a watchdog on behalf of members. I he elccted officials can serve a maximum of two- three year lerms.

Since office bearers are elected they usually have rivals This implies that their rival can easily politicize issues to gain political mileage. I his makes ihe commillcc members very careful in anything that they do.

It is apparent that most of the society employees arc locals and have links w iih members and thus they can also politicize issues for protection especially since they think change may adversely a Reel them.

Iliis being a political office does not always attract professionals. They are however, expected to manage all society financial matters including budget analysis. They do not all have the capacity to dn this. I he Chairman has cooperative management academic training, lie has basic computer know ledge. I be other committee members are not computer literate.

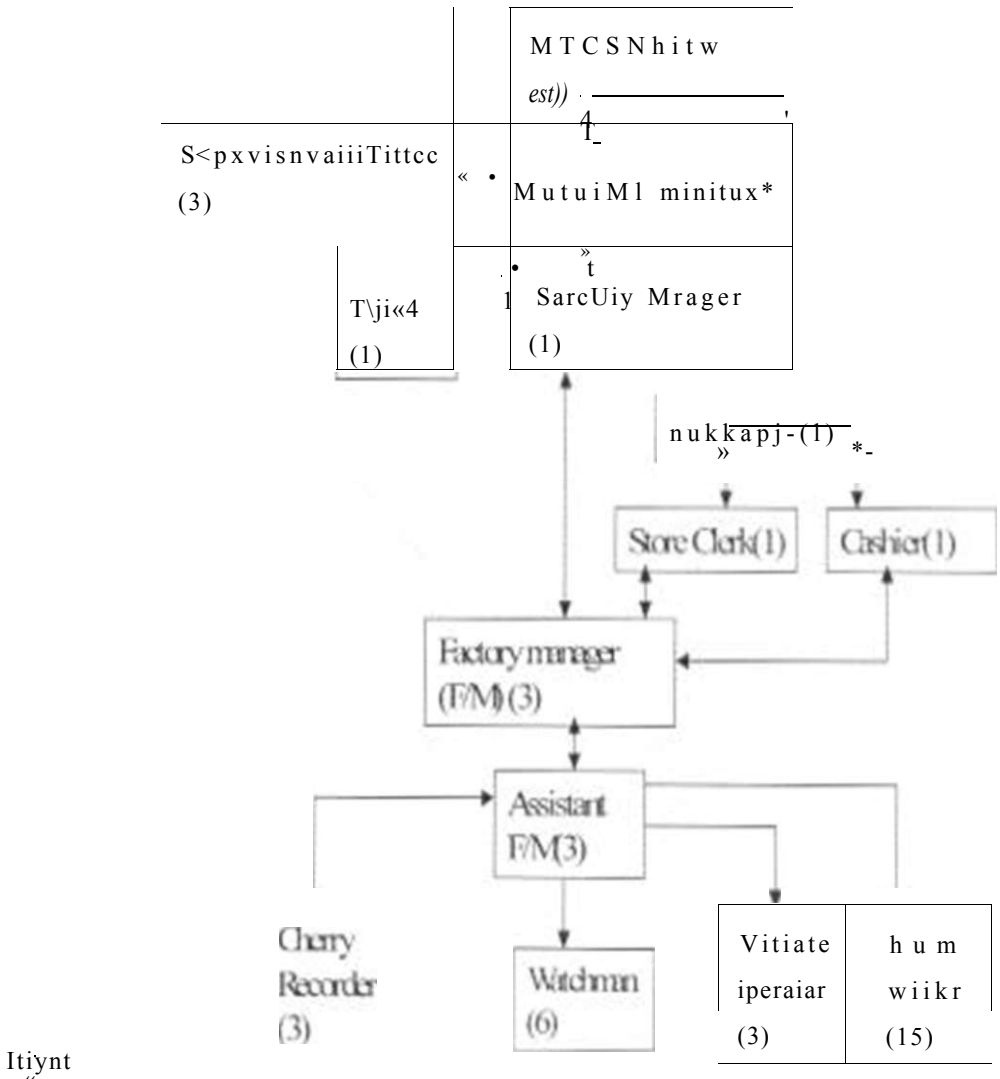
Society organization structure

The meeting room had an organization chart from which the chairman detailed the society organization structure.

Members elect a management committee. The management committees recruit a secretary manager. I he Secretary Manager is a full time employee in-chargc of the day to day running of the cooperative, lie has a typist who assists in the secretarial tasks and a bookkeeper. I he bookkeeper liaises with the fuctory>recording clerks for produce deliveries; a cashier assists in processing payments. The bookkeeper's main responsibility is to ensure proper reporting of financial transactions.

I ach of the three lactones has a factory manager who reports directly to the secretary manager. I he fi»clor> manager has an assistant. Each factory has a cherry clerk, a machine operator. 5-factory workers and 2 watchmen.

I igure 4,1. NCOCS Organization Chart



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Society Strategy

Ever, organization should have a clcar vision, mission and objectives. I he organization needs to analyze its opportunities, strengths and weaknesses so as to position itself at the most strategic position I he society has not concluded development of their strategic plan. The society develops annual budgets. This is used to guide society operations. They are in the process of preparing one with assistance from the District Cooperative Officer.

Member information requirements, shortcomings and recommendations for improvement

The members' information demands are produce receipts, inputs sale invoice, payment advice and statements of account. Members usually rcccivc manual input invoice and a produce receipt from the factory. I hey get their statements and payment for produce advises from the socict) head quarters.

It was also highlighted that as a management they are aware that there arc instances where recording clerks collude with members to overstate produce delivered. At the moment they curb this by rotating the recording clerk without notice.

Asked how much thev knew about computers and their use. onl> the chairman admitted to have basic computer knowledge and has a vague idea that computers could be used to improve service delivery to members. All other members had little Interaction with computers

Data processing system

I he N('< ICS Member Management information system is manual. The society employees use special stationery developed by the Ministry of Cooperative Development and Marketing

(\loCOM) Manual consolidation to prepare society accounts is a tedious exercise. Preparation of payments is time consuming.

Direct and indirect coffee buyers e.g. Utz Kapch require information on producers. Members require monthly statements. Banks require the financial reports to assess credit worthiness of the society should they require credit. I hey receive manual member payment instructions from the society. Insurers require asset schedules and production statistics for premium determination They receive manual schedules Auditors need to report on the management performance. They require the financial records for this. MoCDM review the financial reports and other documents like minute of meetings to ensure proper operations and compliance to laws. MoA crop officers require production statistics. Kenya Revenue Authority needs society records to verify value added tax claims when lodged

The current system docs provide the required reports. I hey produce consolidated financial statements, prepare budgets, compute payments to members, prepare payments to other suppliers, and provide member statements and any other statutory reports required

However, the proposal to implement a new system is likely to get resistance from the employees This is bccause there will be uncertainty especially among the employees as they are mostly not computer literate. Particularly they are anxious what will happen to them especially now that most of them arc not computer literate

.Member information management

I hey hope that this study will provide the information system requirements with which they can seek a programmer to help design and implement the system. They believe that this will assist them in their management of farmer resources, lliey believe that use of computers w ill reduce tlicll of

cherry Hi ihe factories weighing hay and they can also access pertinent information from the internet ,in the international prices and will he able to communicate with their international buyers Besides tbcv foresee use of computers as an opportunity lo reduce pavmcnt period. I his is because data processing i> automated and report generation is likely lo be easier.

Improvement on member management information system activities

Production is expected lo increase this is partly due to sensitization campaigns promoting increased production and value addition undertaken under the (iovcrnmeni of Kenya. World Bank funded value chain based matching grant fund project in collaboration with Coffee Support Network in 2lKK) 7. Ihe society under the project also achieved Ulz kapch Certification. Under the Lit/ program the socicty is expected to maintain current detailed member records lor trace ability. I hey were assisted to purchase a computer, a printer ami internet connection.

In addition representativ es of the management committee attended a workshop in 2007 to launch l oopworksa UOk. I AO initiative aimed at computerizing producer-marketing societies. I hey are sensitized on computerization and its Itenefits.

4.2.2 SSM stage (2) NCGCS eurrent sy stem rich picture

This stage involves expressing the problem situation through rich pictures. More knowledge can be communicated visually. Rich pictures sum up important elements ol the sy stem. Rich pictures should represent structure, processes and issues of Ihe organization, which could be relevant to the problem definition, and try to give an impression of the organizational climate A rich picture is not a system model or system map.

Figure 4.2. A rich picture illustrating different significant system influences

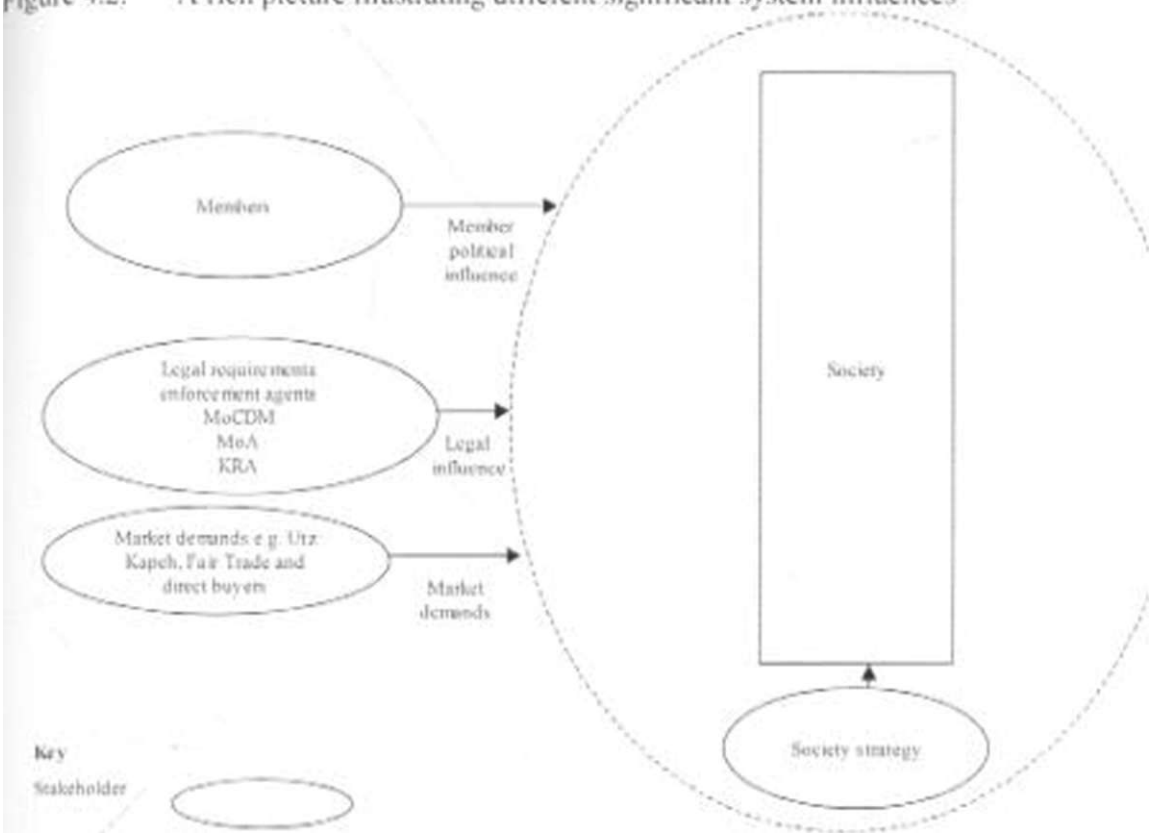

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figure 4.3. A rich picture illustrating a possible gap between specifications and requirements

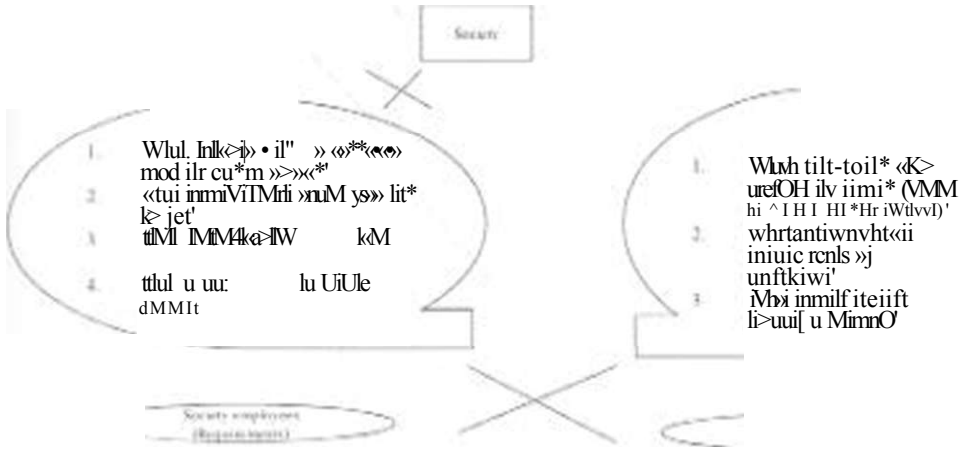

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Figure 4.4. A society rich picture illustrating data (low

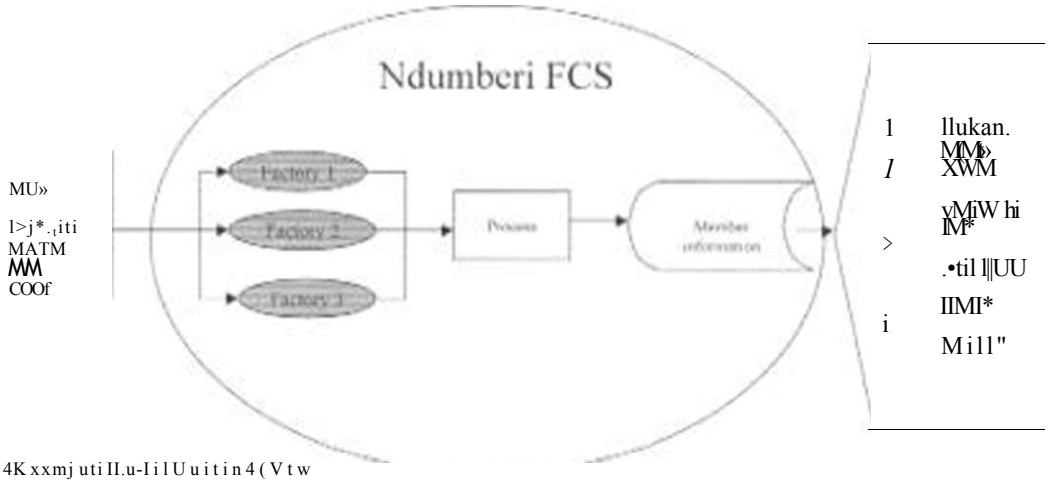

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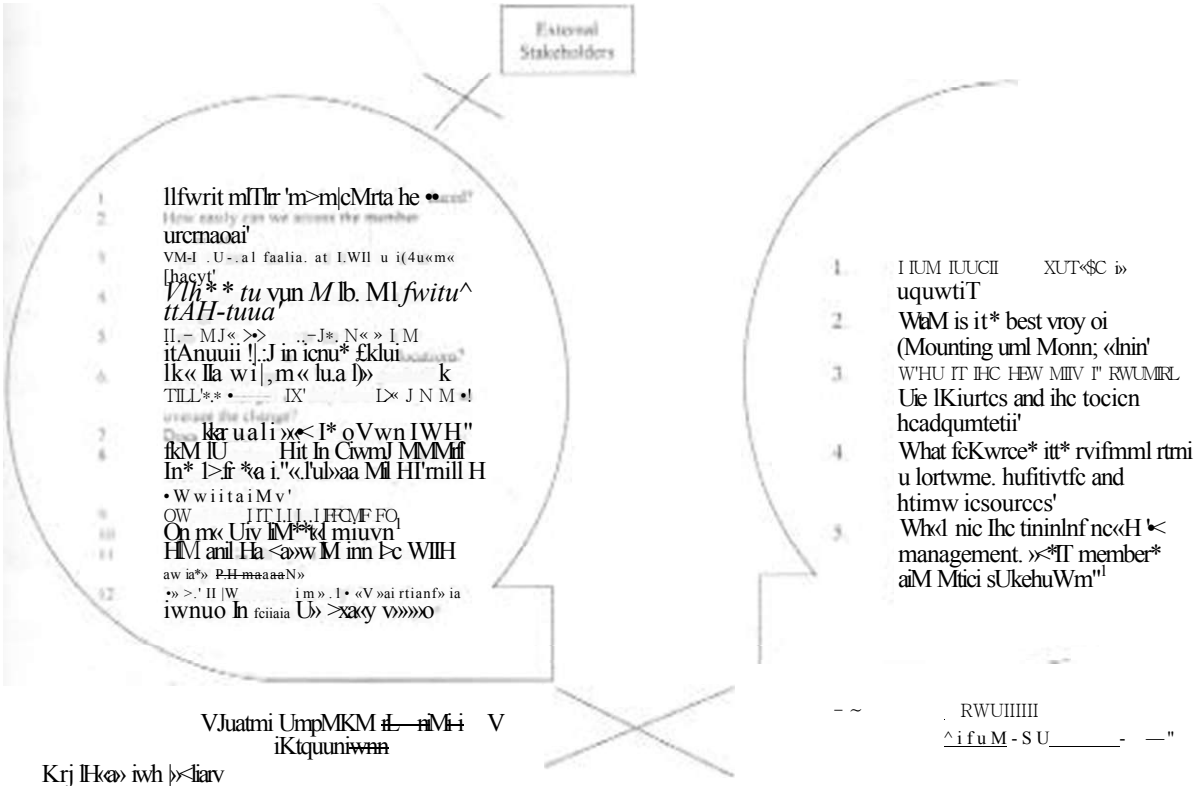
figure 4.5. A rich picture showing gaps between the system specifications and requirements



4.2.3 SSM staee (3) N'CGCS system root definition

Ihis stage involves how to view the situation by producing root definitions. I his assists in clarifying from what different perspectives can v\c look at the problem situation. Root definitions are short textual statements that define the important elements of the relevant system being modeled rather like mission statements, fhey provide information by providing answers to questions like what the system does. How docs it do it? Why is it being done? I he system elements to be identified include Customers. Actors. Worldvicw. Transformation, Owners and Environment (CAT WOE).

CATWOI analysis is a check to ensure that root definitions contain most of what is important During this analysis you identify the customers that is those who will be affected or will benefit from the system, the actors that is those who will process, know the transformation that is what is input - output, need to know the worldvicw that makes the system meaningful in context. I he owners must be identified. I hese aie those with the power to slop the system, finally environmental elements must be accommodated. I hey are outside the sy stem but they intlucnce the sy stem I hey are external and not controllable.

Root Definition

A system to manage member data involving employees who collect data, process and maintain or issue when required member transactions information. 'Ihe system must comply lo legal requirements, market demands, and be aligned to the organization strategy

Customers

Customers are the N ictims or beneficiaries of the system. I hey include millers, banks, buy ers for example I U kapch, suppliers and other service providers like Insurers and auditors.

^ctor

Actors are those who process. They include the management committee and the society stall.

\ctors must see need for change hence need to I* properly sensitized on the improved performance thai can be obtained from a technologically advanced system.

jj-aiisformatlon

mis is the process of collecting and managing member produce transactions. Currently the data processing is manual wliere all transactions arc manually posted and reports extracted manually, Ihis is time consuming and prone to errors. In addition the process is report generation is repetitive, as lists need to lie manually generated. Due to the large number of members, volume of transactions Is high. I his implies it is time consuming to generate reports There has been instances of produce overstatement this is because it is difficult to track deliveries. Also once produce is received it is washed immediately. I hits it may not he possible for the supervisor to reconfirm the quantities.

Uorld view

I IK system has been useful. It has served the members lor a long time. Ihis is because previously there were no technological opportunities to enhance service delivery. The demands and expectations ofthe users were met and hence it has been satisfactory.

However technological advancement and user empowerment is compelling the management to review their system and explore opportunities for improvement. I lie challenge though is that the system will bring about changes. There may he resistance to change from the customers due to change resistance. The project will have financial implications. Members will have to forego their earnings to support the project The management committee will therefore have to create a strong case for changeover

Ow ncrs

N d i C S members

Environment

TTerc are many elements outside of the system, which influence the system. I hey are not controllable and their requirements must be met. I he system must therefore be responsive, for example, the society needs to adhere to government regulations and guidelines

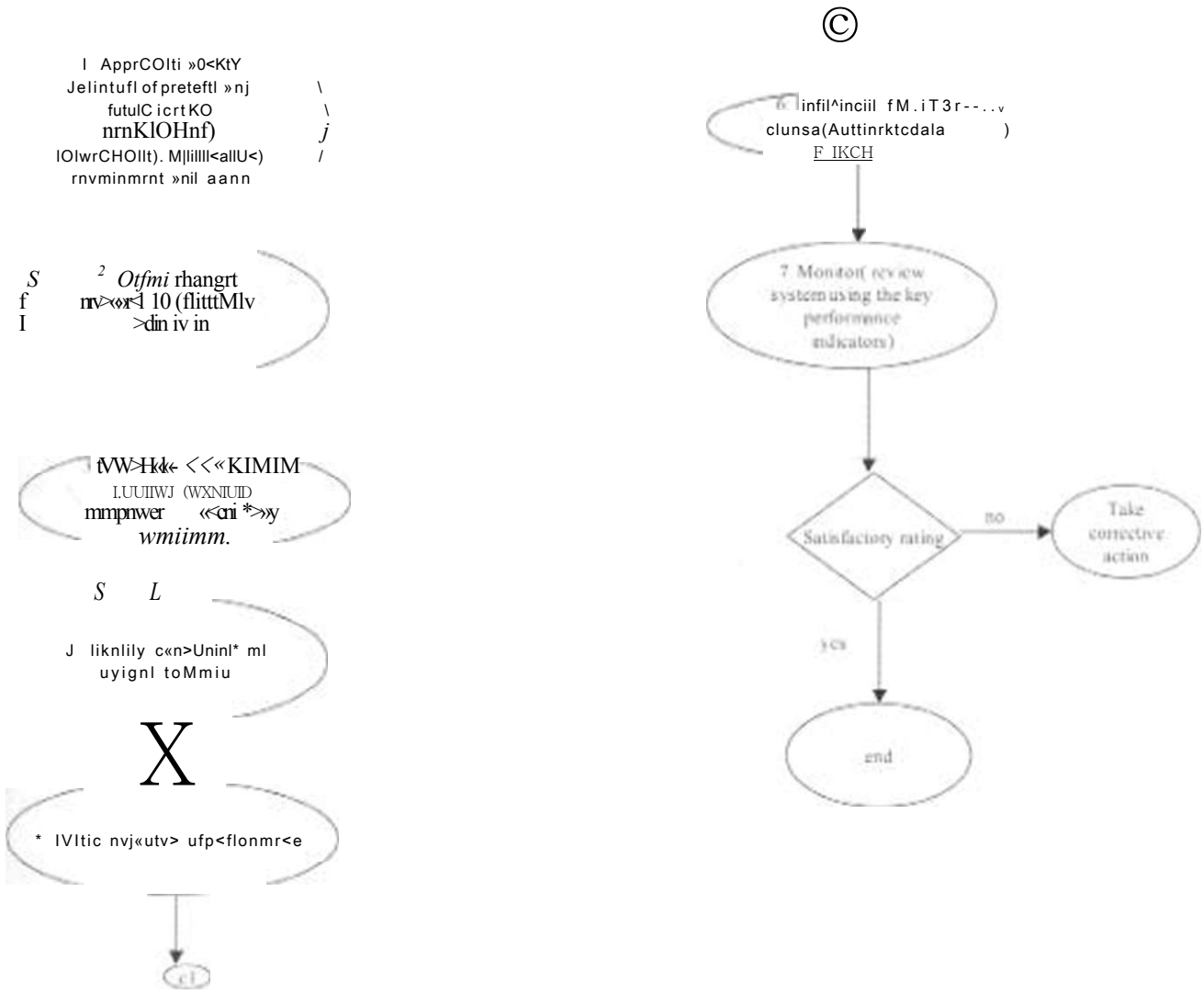
4.2.4 SSM stage (4) - development of a conceptual model

During stage four a conceptual model, which describes the activities that must take place in order to achieve the transformation and also how the operation of the system was to be monitored and controlled. Monitoring and control activities usually revolve around the three lis of efficacy, effectiveness and efficiency, liflicacy requires that the system has a purpose to lull ill (i.e. thai the transformation is still necessary within the broader view), effectiveness requires that the system is designed correctly to fulfill its purpose (carry out the transformation) and efficiency requires that the system carries out the transformation with efficient use of resources.

Conceptual models are generated with reference only to the root definition and not to activities taking place in the real world. I hey are. then, theoretical models of sy stems that can bring about the stated transitions and their value lies in comparison with the real world activities.

Building conceptual models involves stating what the system must do for each other It gives the how of what the system w ill do. I he society seeks to get a modern system with the ncccssary functionality to fulfill financial management system.

l-igurc 4.6. Conceptual model



4.2.5 SSM stage (5) - comparison of the conceptual model with the real world.

During this stage, comparison is done between ihe conceptual model and the system to determine whal changes arc to be done on the system.

Hie current system is mostly manual with minimal use of the computer and printer. Weighing is done using a manual scale. I here is an opportunity to use a digital scale connected to the sociely database and hencc automate the weighing process. I here is also an opportunity acquire software to automate member data processing. I here is need to acquire equipment to support networking such that the central database is linked to all the factories needs to be developed, there is an opportunity to reduce duplication and icduce time to produce reports. Data backup is not done a.s most ol the records are manual and arc all stored in the society offices. Report export to Ms Office programs is not done while it would support data manipulation for analysis and forecasting. Ibis is not done as most reports arc manually generated.

The next feasible change is to train the society employees on use ofcomputers as well as mandatory training on basic management and record keeping. The proposed sy stem seeks to enhance service delivery to its customers. I his is bccausc it will be flexible and can support different report format generation. It will simplify' the actors' work, as it will reduce duplication Many people fear the unknown and would prefer status quo besides this being a social set up the costs directly reduce personal gains. The members must be able to relate the benefits widi the cost. Ihe change management process must therefore be handled carefully for success. It is advisable to appoint a change agent to guide the change. The owners will still be tin- NCGCS members. It will make compliance to statutory requirements and other environmental forces demands faster

4.2.6 SSM stage <6> - implementation of feasible and desirable changes

Technical, economic, operational social/political feasibility considerations need to be done to assess the benefits, costs and impact ofchanges Vis a Vis retaining the current system. At the end of it a decision is made on whether to implement a new system or retain the current system. The review ensures useful use of funds, facilitates proper planning and avoids disruption of the organization's strategy, structure and way of doing business.

Operational feasibility

It would he ideal to automate from the weighing process to networking the factories. However, due to ihe distance between the factories and terrain. Ihe cost may be exorbitant thus not justifiable. Besides replacing (lie entire computer illiterate staff with computer literate staff may IK* challenging especially because location of the factories is usually remote and most of the skilled staff would not be attracted I he society may not afford to pay for the services required. Since the system is tailor made design, testing and implementation may take long which would cause anxiety among the bcncliciuries. It may be useful to consider using open source software and tailor make il for the society use.

Economic feusihilitv

When undertaking the economic feasibility you establish if it is a good investment. Ihe current system is manual they only require to purchase the stationary and require literate staff not necessarily computer literate. On the other hand u> automate the record keeping, they will have to purchase new equipment, pay for software development, recruit new computer literate staff to nmnagc the system, and undertake lo train the clerks intensively. 'ITtey will have to plan to increase staff during system changeover to support parallel running during system testing, they will now have to budget for annual system maintenance costs.

However, the opportunity to access niche markets where the price per kilo may increase by over 40% and they may be able to reduce the theft during weighing thereby increasing payment rate per member may compensate for increased costs and disruption. Generate prompt management reports to support decision making to take advantage of offers through quick data analysis. Retention of the current manual system means they are unresponsive to current stakeholders demands and may become irrelevant. Implementation of an automated system is better tlum retention of the current system.

Technical feasibility

Seeks to establish if it possible to gel reliable hurdware. and software capable o(meeting the needs of the proposed system in terms of volume of transactions and data sharing needs, response time and technical staff.

I lie hardware with the capacity to process the volume of transactions is readily available: the challenge is that the software to support member management information systems is not readily available. This is because the closest software available Coopworks developed for producer cooperative societies, but has only been tailor made for dairy cooperative societies. I he society would require to mobilize resources so as to tailor make it for coffee cooperative societies The society management and staff do not have sufficient capacity to undertake such an activity due to the financial resources and technical skills required. Besides the society staff have basic computer skills and may not be able to manage the system

Technical feasibility is a function of the implementation stmtegy adopted. In this regard there will be need for a software developer to establish the system requirements for a coffee cooperative society. There is high risk as there arc no comparisons in the scctor. Ihus the system Implementation will be in phases so as to achieve desired results in the long run. I his is because

there are no coffee societies that are automated therefore implementation should be at a reasonable pace to allow tor learning.

Social/Political feasibility

The concern is if the system were likely to meet a lot of resistance from would be users such that jhey frustrate its operation. If there is no political goodwill the system would not achieve the desired objectives. There is need to organize intensive stakeholder capacity building for buy in and to reduce resistance to change. I his is because most ol the members are not computer literate.

4.2.7 SSM stage (7)-rec«immendations for taking action

From the analysis a system with the following features should be implemented: A central database to he developed with the factories linked via a wireless local area network <1 \N). I here will be databases at each of the factories, which will be uploaded to the centnil database daily.

I he secretary manager is to oversee the data entry, update and generation of reports. I he bookkeeper should be the sy stem administrator to assign user rights and update data entiy after checking posting. I Ic should also maintain (he chart ofaccounts. Posting clerks who are involved in primary data input of credit sales, deliveries and advances. The system administrator will ensure that all data backups are done properly, ensure the overall system environment is safe, assign system users and give the relevant roles. Document and communicate to the system developer any new requirements and technical problems.

Risks management strategy for system breakdowns, theft, staff sabotage or unexpected costs monthly backups w ith the data being stored offsite. Proper change management for staff to appreciate their roles and adapt to the changes, contingency plan incase ot shortfalls. I he implementation will be done in phases where the financial resources are restricted. Insurance for the equipment needs to be organized.

physical infrastructure, equipment security all equipment should be stored in a secure place well aerated, dust Irce. dry with adequate light.

I raining • intensive training for the management committee, clerks and bookkeeper to upgrade their computer skills and financial analysis skills and change management is required The bookkeeper is to be trained further to do basic maintenance of the system and also act as the MIpen isor. New accounts stall'w ith advanced book keeping training should be recruited. Special attention should be paid to change management. I his is bccausc the project benefits and dy namics may not be as obvious to the beneficiaries and thus need to be convinced Besides there may be resistance from the employees who do not have the skills required and therefore their positions are threatened

Change over strategy Kith the manual and automated databases will he run in parallel for a tew months so that the statt w ill have time to use get used to the new system. I his implies a budget for extra stall for a few months.

Post implementation there is a budget for technical maintenance contract: staff training updates, insurance and Internet acccss. After three years the computers need to be replaced
In conclusion to determine the requirements lor computerization ol a coffee cooperative society, the following steps should be followed:

Challenges encountered during requirements engineering process for n s«K-i»l informatics system

I he study besides the requirements determination sought to highlight the challenges encountered in the requirements engineering process for a social informatics system. I.sing soft systems methodology was thought appropriate considering the influence of social and political factors and

the opportunity that the method affords to study the organization to know the bottlenecks and business goal that needs to be addressed and tlve best approach. I he stakeholder workshops helped highlight issues that a waterfall approach to requirements engineering may not highlight. It was challenging to use the methodology because to use it the researcher needs to train the participants so that they can be able to participate fully. It was challenging to train the society leaders, as they are not necessarily professionals From this experience, the methodology is most suitable for use with professionals.

I here was limited time to undertake the study, t his is bccausc the nature of producer cooperative societies is that the elected officials need to be lacilitated to attend meetings. Combined member lathering* arc scheduled and far apart IX-pcnding on the duration of the meeting they need to be facilitated financially to attend.

I he capacity ol the stakeholders on the IC I opportunities is limited. Another limitation was that the stakeholders mistook it for consulting and therefore expected the consultant to have all the answers. Ibis somewhat made the stakeholder workshops challenging to conduct. There is undeniable influence of the 'consultant' on the final report. This raises the question as to whether the recommendations arc 'owned* or are they just the consultant's ideas pushed on them. Care was taken to keep the consultant role of guidance.

SSM requires several iterations whereby the iteration identifies fresh requirements. This was not possible bccausc the setting of the cooperative societv is such that getting the stakeholders to meetings is expensive and loo time consuming

Chapter 5. SUMMARY CONCLUSIONS AND RECOMMENDATIONS.

5.1 Introduction

I his chapter discusses the conclusions of the Study in line with the objectives of the studv. I his was a system requirements engineering study for the determination of a member management information sy stem requirements for Ndumberi Coffee Grower. Cooperative Society. It also sought to establish challenges that arc experienced during the requirements analysis process for a social informatics system.

5.2 Summary and Conclusion

[he objective ol the study was requirements engineering for NCGCS information system. Cooperatives .ire established for convenience and do not have a profit objective. The members are also not too enlightened of what features are desired for a technologically advanced ideal sy stem. However, with support they were able to give indications of their expectations. I he documented process in this project is based on what is to be obtained directly from them and inferred. I he commillce alter review of the spec i Ileal ions is satisfied that the specification will deliver a system that w ill meet their current needs. I o determine requirements for a cooperative, the researcher needs to identify stakeholders, collect their concerns and draw conclusions on their requirements. Review existing system performance, resources utilized and capacity ol organization. Identify suitable solutions to the existing concerns, assess resources required to provide the suitable solutions, implement the solution and monitor performance. Take corrective action if required

Use of soft systems methodology for requirements engineering is useful in thai it provides an opportunity to explore the views and opinions of users, actors and owners ol the system. Ibis assists

in improving the design and taking into account the sort issues. Using this method, allows for a broad understanding of the system not restricted to hard issues. It provides for inclusion of the views and expectations of the users. By employing a systems based methodology such as SSY1 we have been able to see the value of trying to capture the different perceptions of all participants m system design and delivery. It also provides an opportunity to compare views and expectations of various stakeholders.

Using the SSM approach provides an opportunity to understand the information system environment and the environment Influence 0l1 the system, therefore the requirements determined will he responsive lo the environment.

SSM is often described as a process of investigation and learning and in reality continually loops around the seven stages. Ii focuses on the soft issues. It is expected that subsequent loops will generate new insights. Due to time and resources constraint, it was not possible lo loop again. Subsequent loops are an opportunity for further investigation and changes.

I he second objective was to establish challenges of ihe requirements analy sis process for a social informatics system. I he main challenge was the fact that the social and political factors largely influence their decisions other than the economic impact of the decisions. I his implies that in implementation of such a system the change management component would have 10 be intensive.

Determination of appropriate requirements engineering methodology is a challenge Soil systems methodology is complcx and there is need to train ihe participants for its effective use. It was established that the key decision makers arc elected: hence they may not necessarily be professionals, fhey have varied qualifications. I he criterion for election is popularity other than management competence. Most of the members are not literate therefore they need lo be convinced

beyond reasonable doubt what benefits can accrue from implementation of such a system anil that the benefits exceed the cost. I his is because members should share all proceeds after deduction ol costs.

Adverse politics loo can hinder implementation of Otherwise givnl improvements. Coffee growing had declined; reduction of cash paid for such an investment may not be welcome. The matter can be politicized to the level of the committee being accuscd of misappropriation of funds. The change management should be done effectively to achieve objective.

From the study the society employees are not computer literate. This means that they would have to be intensively trained or replaced with trained staff. I bus resistance to change would also be high among the start', l or example during the study they were anxious to know what the recommendations would IK and the impact it would have on them.

Study findings indicate that cooperative information system development is complex I here .ire many stakeholders hence difficult to obtain all the information at once It is also time consuming, as users have to be assisted in identify ing their requirements. Perhaps this is because there are no other cooperatives w ith automated systems for them to relate to. Infrastructure challenges like distance of the factories may hinder achievement of the conceptual ideal system design.

I lie cost of implementation is expected to be high. While the management committee may know the benefits of such .1 system, bad politics may make members reject the proposal as a waste of resources.

5.3 Challenges

Action research involves heavy involvement in the research situation, with ihe opportunity for relevant learning, but at the potential cost of objectivity. Conflicts may arise because of the difficulties of satisfying two audiences with different needs, the clients and the research community. Rigorous rellectivc thinking and good documentation of the research pri>cess are used to overcome these difficulties. I he research design is established as follows: An action research projcct in ISl) in a producer cooperative society is conducted using SSM. Reflection on the research leads to theoretical developments in SSM. In this case the management of the society thought thai ibis was a consultancy thai would help them develop their system Ihey did not seem to acknowledge thai this was u study.

SSM is criticized because it doesn't actually tell how to build a sy stem, that there is no real method. Management oriented critics worry that the open ended nature of SSM makes it impossible to manage. Checkland himself has said that there is no way of telling whether an SSM project is a succcss or a failure. I he same crilicism applies to any prototyping or evolutionary approach • perhaps traditional ideas of project management just don't work for organization change. Ii was difficult to establish if Ihe ideal sysicni had been developed SSM methodolop does not provide guidance on this. For example how many iterations of reviewing the system will produce ihe optimal system?

Radical critics say that SSM assumes that all members of the enterprise have a choice, in fact equal choicc. The idea lhat managers and workers can openly discuss their problems and needs is fanciful SSM ignores issues of power. SSM supporters would reply that the very act of open discussion changes the organi/alion.il culture and empowers workers, though some would also argue for Ihe rationalist "common good" view - "what's good for the company is good for the workers".

Critics also argue that SSM involves manipulation by the consultants that, like "human relations' management, can trick the participants into thinking they are happy with the consultant's hidden agenda. I urthcr. critics claim. SSM imposes values of openness and "nicencss" which arc more suitable to middle class academics than to managers or workers. These criticisms do indicate that SSM has a fairly simple understanding of society. Nevertheless, the use of "socially aware" methodologies such as SSM has been growing gradually as people see that IIK- outcome ot "hard" systems approaches is seldom satisfactory to anyone. I he openness proposed in SSM i-. good however harmonizing the thought to consolidate into a system is the challenge the data analysis process is complex and therefore takes a long time to undertake and conclude the research.

5.4 Kccommcndulions for Future Research

One disadvantage of SSM is that the method is iterative: subsequently it is difficult to say with authority that the requirements identified arc the final ones and thus are the best. A follow up study- can be conductcd to confirm thai the requirements identified are exhaustive. A further studs can be conducted to provide detailed requirements for the system development as this study focused more on understanding the system and identifying the soft issues than developing a detailed specification report for the sy stem development. A study can be conducted using the traditional systems development processes to compare w ith the specifications of this study Once the system is implemented a follow up study can be conducted to document impact of social and political factors post implementation to appreciate their effect on the MIS.

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APPENDICES

Appendix I Stakeholder Workshop Programme

1. Chairman's Opening Remarks
2. Climate Sening (Introductions)
3. Objectives ol the workshop
4. Training on Soil Systems Methodology
5. Consultant led brain storming session using the stakeholders workshop discussion guide (Appendix 2):

Appendix 2 Stakeholder Discussion Guide

1. What services do you oiler to your members?
2. Do you know if tltcy are satisfied?
3. Do your millers assist you in any other way?
I. Are you satisfied w ith the scrv ices they offer you?
5. Would you change y our miller?
6. V> ho markets your coffee? l or how long have they marketed your coffee?
7. Arc y ou satisfied with the services?
S. Do you have a strategic plan? If ves go to 9. If no go to II)
9. What are your objectives, vision, and mission?
10. What is the organization culture?

    a. Process v results oriented, employee v job oriented, parochial vs. professional, open system vs. closed systems, loose vs. tight control
    h. Do you get complaints from members on service delivery?
    c, I low do you solve the issues raised?
    <1 I lave you ever had rebels among the members?

11. Do you believe computerization can improve service delivery ''

12. Economic perception and awareness ol managers to the economy?

13. V\ hat are the policies, procedures and specifications necessary lor the operation, maintenance and evaluation of the sy stems solution?

14. What are the attributes that must characterize the solution?

15. W hat are your expectations of the MIS solution '

16. IXi you have a sponsor lor the IS implementation? It'yes, what is the arrangement?

17.1 low much can you allocate lor the IS system?

1K. W ho are the people stakeholders? (Essentially all those who have interest in the system or who are likely to be uffected by changes to it).

Stakeholder	Requirement
Kenya Revenue Authority	
VKXIVM	
Ministry of Agriculture	
Utz Kapeh	

Appendix J Employees Workshop Discussion Guide

I. Who are your customers? (Essentially all those who have interest in the system or who are likely to be allectcd by changes to it).

stakeholder	Requirement	Information How
Management (ommittcc		
Supervisory Committee		
Secretary Manager		
Book keeper		
Head Office Inventors Clerk		
1 lead Office Cashier		
Individual Factory Manager		
Individual 1 actorv Store Clerk		
Individual Factors Produce Recording Clerk		
Kenya Revenue Authority		
MOCDM		
Ministry of Agriculture		
I t/ kapch		
Suppliers		
Banks		
Members		

2, What is yourJob title?

3. What is yourjob description?

A. I low do you record the members produce information?

5. W hat arc the challenges you experience while processing data?

6. \\ hat improvements can be done to make the system more efficient?

Appendix 4 Interview Schedule

1. When was. Ndumberi (offee Growers Co-operative Society Ltd registered?
2. Why was the society started?
3. I low many factories do you have?

I How far apart are they from the head office?

5. How is the data from the factories processed?
6. How many registered members do you have?
7. How many active members do you have?

8 I low many dormant members do you have? Why?

9. What services do you offer to your members?
10. Do you know if they are satisfied?
11. W ho mills your coffee? for how long have they milled your eoflee?
12. IX> your millers assist you in any other way?
13. Are you satisfied with the services they otfer you?
14. Would you change your miller?
15. W bo markets your coffee? For how long have they marketed your coffee?
16. Are vou satisfied with the services?
17. IX) you have a budget?
18. Do you prepare management accounts?

Organization structure description.

Committees					
Committee name	Committee structure	Number of members	I'errn in office	Committee member academic/ professional qualifications requirement	Role
Management Committee					
Supervisory Committee					
Society staff					
Office of the Secretary Manager					
Office of the hook keeper					
1 actors accounts					

20. IX> you have any of the following equipment (How many)?

Equipment	It Yes indicate			If No
	Number	Location	Features	Mark with an X
Computer				
Printer				
UPS				
Photocopier				
Fax				
1 elephone				
Network resources				
Software resources available				
MS office				
Windows XPoperating system				
Windows server operating software				
Services				
Internet				
Own Website				
1 mail				
Knowledge of computer packages	Mart; with an X			
Package	Excellent		Average	Computer Illiterate
Ms OilIce				
Ms Access				
Windows explorer				
Others Please specify				

21. How do you record the members produce information?

22. How do you analyze it to generate reports required at your level?

23. What is the frequency of generating these reports?

24. How many transactions do you process per day?

25 W hat improvement in your current information system would you propose?

26 What improvements do you hope to gain?

27. What is your professional qualification?

28. What is your career plan?

29. Do you have plans to further your education?