

CHANGE MANAGEMENT GUIDE FOR CHURCH-BASED HEALTH FACILITIES

Improving Tanzanian healthcare
delivery by using ICT



Evangelical Lutheran
Church in Tanzania

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Colophon:



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Table of Contents

Acronyms and Abbreviations.....	5
Management Summary	6
Change Management Guide: Fourteen steps towards having a well-functioning Hospital Management Information System (HMIS)	
Step 0: Awareness raising and establishing contact with the key decision-makers.....	7
Step 1: Have a meeting with management officials to collect contacts and introduce the HMIS.....	8
Step 2: Leadership preparation, demonstrations, and in-depth discussions with management.....	8
Step 3: Contract.....	11
Step 4: Audit and definition of requirements (with management).....	13
Step 5: Set up the classroom and start the training	15
Step 6: Collect and analyse critical data for a joint workshop	15
Step 7: Joint workshop	16
Step 8: Implementation.....	18
Step 9: Trial period A	18
Step 10: Trial period B	19
Step 11: (Distance) Support and trouble-shooting	19
Step 12: Evaluation and establishing a business case	20
Step 13: Lessons learned.....	20
Step 14: Continuous improvement.....	20
Resources: materials and examples	
ANNEX 1: Example of a feasibility study for a Hospital Management Information System	22
ANNEX 2: Health care in Tanzania and why it is so important to use ICT	52
ANNEX 3: Preparation.....	58
ANNEX 4: Implementation	71
ANNEX 5: Monitoring and evaluation (M&E), lessons learned and follow-ups.....	78
ANNEX 6: Workshop with Evangelical Lutheran Church in Tanzania (ELCT) Church Leaders and Medical Secretaries	80

Acronyms and Abbreviations

AfyaMtandao	A network for stakeholders in the Tanzanian health sector to facilitate the exchange of knowledge and good practices about the use of ICT in health.
AMVTN	The African Malaria Vaccine Testing Network
Care2X	An Open Source health management information system (HMIS) software package
CMO	City Medical Officer
CSSC	Christian Social Services Commission
DMO	District Medical Officer
EAMU	East Africa Malaria Unit
ELCT	Evangelical Lutheran Church in Tanzania
ENRECA	Enhancement of Research Capacity (Health Research Network based in Tanzania)
FBO	Faith Based Organisation
GDP	Gross Domestic Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
HDI	Human Development Index
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HMIS	Hospital Management Information System
ICT	Information and Communication Technology
IICD	International Institute for Communication and Development
IPD	In-Patient Department
IT	Information Technology
LAN	Local Area Network
MEMS	Mission for Essential Medical Supplies
M&E	Monitoring and Evaluation
MoH	Ministry of Health
MoU	Memorandum of Understanding
MTUHA	Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya (Kiswahili for HMIS)
OPD	Out-Patient Department
SEHA	Saint Elizabeth Hospital Arusha
UNICEF	United Nations Children's Fund
UPS	Uninterruptible Power Supply; a stabiliser and back-up for electricity
USD	United States Dollars
VSAT	Very Small Aperture Terminal
WAN	Wide Area Network
WEB ERP	An accounting software package

Management summary

The need for a well-defined 'Guide to Change Management' became clear as a result of experiences acquired at the pilot site in St. Elisabeth hospital and other hospitals in Tanzania where Hospital Management Information Systems (HMIS) are currently being implemented. Consequently, this guideline is meant to inspire future HMIS implementation teams on the one hand while providing them with a useful reference framework on the other. It is based on the experience of Care2X software implementation in faith based hospitals, but it can also be used to guide the implementation of other HMIS software packages, in a wider range of hospitals.

Healthcare is a very information-intensive line of business. Apart from the banking industry there is hardly any other line of business where so much data, information and knowledge is used during the production of services. That is why the application of information technology (IT) has such a profound impact in healthcare.

Based on experiences derived elsewhere, one might expect that for the faith-based medical facilities the impact of implementing HMIS can be very profound: reductions in paper work and costs, improvements in financial management, improvements in the quality of care delivery, an overall increase in the productivity of medical professionals, etc. At the same time, it will give an enormous impulse to the transfer and distribution of knowledge.

Introducing a Hospital Management Information System (HMIS) will have a profound impact on the healthcare institution in question. It will include far-reaching organizational changes as well as a change in the existing culture. That is why it is very important to get a broad and thorough understanding of the prevailing values, conventions and beliefs within the institution, i.e. insights into the factors that determine people's behavior in this context.

This guideline is based on a proven and successful approach in the health sector, as well as in other sectors such as governance. It uses a 14-step approach, starting with the germination of the original idea to set up a Hospital Management Information System (HMIS) right through to the establishment of a fully operational system.

Steps one to five are about preparation and training: laying a strong foundation is the first requirement for constructing a sturdy building.

Step 6, 7 and 8 are the core of the approach. Together, management and staff decide on the 'what' and the 'how' with regard to implementing the HMIS. This hinges on identifying the specific problems of the health facility and then developing a joint vision on where to go to.

Steps 9 to 14 are all about troubleshooting, implementing the Hospital Management Information System, and finally handing over the full-fledged system to a capable workforce that is able to work with it and maintain it.

An additional advantage is that when an HMIS is finally implemented this not only enables management at all levels to have sufficient data at their fingertips to manage their administrative tasks more efficiently and make more informed decisions, but also makes positive change more attractive to the staff as a whole, who by now know the benefits of change.

Change Management Guide: Fourteen steps towards having a well-functioning Hospital Management Information System (HMIS)

Main steps

A set of 14 steps is presented below. They cover the whole trajectory of HMIS implementation; from identification to a fully functioning and institutionalized Health Facility information system. Why is it necessary to go through each of these 14 steps, one by one? We have learned from a number of HMIS implementations in the past that management and healthcare staff have to first familiarize themselves with information and communication technology (ICT) and that every situation is different. It is very important that everyone involved in the health facility can speak out about the problems they encounter, as well as suggest possible solutions, and that they can think along on how to implement an HMIS. By involving everyone in the design and implementation of the HMIS, all can contribute and each individual can adapt to the changes this will inevitably bring. Annex 2 contains general information about Tanzania that will help the reader place the information described in this document in context.

The steps differ from one institution to another, depending on who owns the hospital. For example, the Catholic institutions are more directly dependent on the diocese. Therefore it is important to start at the diocese level and identify the key decision-makers on all issues arising at the facility level. For other denominations the autonomy at hospital level might be much greater. Nevertheless, this is step 0 - about awareness raising and obtaining permission to approach a hospital - so it is therefore much better to gain strong support at the diocese level or from the district authorities. Annex 3 provides additional information about the preparation phase (step 0 to 5).

Step 0: Awareness raising and establishing contact with the key decision-makers.

Objective: To make central decision-makers and health workers aware of the benefits of HMIS.
Activities: Collect contacts (email addresses, telephone numbers, etc.) starting with top level management (key decision-makers) like Diocesans and then work your way down to the hospital management level and those in charge.

Awareness can be raised by targeting specific sessions that are already scheduled to take place. For example, try to get a one-hour time-slot during a meeting of all the bishops. Special meetings can also be organized. In addition to the above, flyers might be helpful, or articles in the local or national newspapers, or spots on TV. AfyaMtandao, the national ICT for health network in Tanzania, can be of assistance in this process.

Who is involved: Decision-makers.

Time required: Ranging from 2 minutes to 2 hours.

Deliverable: Openness for, and an interest in, HMIS.

Step 1: Have a meeting with management officials to collect contacts and introduce the HMIS.

Objective: To initiate contact.

Get an idea of what they want and what their main issues and concerns are. Do not start talking, but invite them to come with their own specific challenges. Now you can make a more tailor-made link to the Hospital Management Information System (HMIS). Indicate what kind of solutions HMIS can bring. Be sure to evoke the right expectations. If HMIS *cannot* provide the solution, be clear about that as well! Provide a brief description of the services offered by the Evangelical Lutheran Church in Tanzania (ELCT) ICT & Change Management Team.

The following can be the solution for HMIS implementation in the facility:

- ✓ **Data collection** - capturing and storing the data makes a simple compilation of the data collection.
- ✓ **Transparency** - authorized personnel are able to access the financial information and see how much is generated daily, monthly and finally yearly.
- ✓ **Financial security** - this will help to prevent private income generation because every transaction will be captured within the system.
- ✓ **Time management** - it will save time since everything will be computerized, for example: preparing reports.
- ✓ **Manpower** - the work that used to be done by more people over a period of several days can now be done by fewer people in less time.
- ✓ **Stock control** - the tool is capable of carrying out stock checks since it is integrated within the accounting package (WEB ERP) which takes care of both accounting and stock control.

Activities: Collections of contacts, (email addresses, telephone numbers, etc.), starting with the top level management officials (key decision-makers) such as Diocesans and then working your way down to the hospital management staff and those in charge. Arrange to have meetings with Diocesans and other stakeholders at the diocese level. Give an introduction that explains who we are and what we do. The tool can be demonstrated to show how it works and what it can deliver.

Who is involved: key figures from the diocese, hospital administration staff.

Time required: 0.5 to 1 day

Deliverables: A succinct report of the meeting(s) and a list of subsequent activities. The ICT & Change Management Team knows what kind of demonstration they have to give and to whom. The ICT & Change Management Team prepares step 2 and 3.

Step 2: Leadership preparation, demonstrations, and in-depth discussions with management

Objective: To facilitate well-informed decision-making by management officials (this can be done at the hospital management level) and to ensure that those in authority accept the participatory approach and are prepared for it.

Activities: This is an important and critical step. It should allow management and staff to make sense of using HMIS, to feel that they themselves are the owners of the process of implementing HMIS and of the final system, and to build confidence in the ICT & Change

Management Team as their advisers and experts. This is a lengthy step involving five sets of activities:

- 1) Carry out an analysis of the current way of working (the present-day model);
- 2) Let the staff know what HMIS is by analysing the current situation;
- 3) Demonstrate the HMIS software to the staff, clearly communicate what it can provide, and carry out some capacity development activities;
- 4) Perform a stakeholder analysis listing the advantages and disadvantages for each group involved: 'What is this about?' 'What is in it for me?'
- 5) Start to develop a business case.

1) The present-day model: get to know the existing system: Is it beneficial to the staff? How do they generate and collect information and data through the existing system?

2) Let the staff know what HMIS is by analysing the current situation. Know what HMIS is – give the staff the time and space they need to brainstorm; give them enough time for discussion. Is it timely? Are people conscious about quality, speed and cost? Are they satisfied with the current situation? After getting their thoughts on the current situation, develop a *Benefit Model*. Make management understand the importance of 'change management'.

3) Demonstrate the HMIS software to the staff and clearly communicate what it can provide. Brainstorm and allow questions. Start with the top-level leaders and department heads: they should be able to identify their roles and responsibilities with regard to implementing the new system. At this point you should ensure the leaders' ownership of the project. 'Ownership' means that they have time to explore the concept of HMIS, to understand and 'digest it', and to have the chance to say: "This is what we want". Capacity building should then be carried out to understand the tool and to be able to track it. By demonstrating HMIS - how the software operates and what it can deliver - we gradually proceed to the stakeholder analysis. Demonstrate HMIS and show some successful applications. Show them how the software operates and what it can deliver. What are the benefits for the organization, the individual and the patient?

4) Perform a stakeholder analysis listing the advantages and disadvantages for each group involved. "What is this about?" "What is in it for me?" It is human nature for people to think first and foremost about their own personal benefits and then about the benefits for the organization. Identify the stakeholders involved in terms of broad categories only: Staff, Patients, the Health Facility as an organization. Conduct a brainstorming session about the advantages and disadvantages of the HMIS so that people start thinking about it. Some examples of this are given in the box below.

The advantages and disadvantages of a Hospital Management Information System (HMIS)

Advantages for staff

- They acquire knowledge – which adds value to their career
- It simplifies their daily work
- They gain transparency which will help to avoid any allegations that they are stealing the hospital's money.

What are its advantages for the patients?

- Less time spent at the facility
- Getting the right medication as all the diagnoses will be done by computer.
- Accessibility and reliability of the patient's own personal data if he or she revisits the facility: it will be very easy to get data about an individual patient, such as their original diagnosis, admission information, etc.

What are the advantages for the organization (health facility)?

- Accessibility and availability of data at all times, whenever the management/organization needs the data for different purposes, such as organizational planning and decision-making.
- Financial security and stock control of the hospital.

This stakeholder analysis and the development of a business case (see below) have to be facilitated very carefully by the ICT Technical & Change Management Team.

- The facilitator has to listen very attentively.
- Pose questions in order to have a better understanding, especially about the underlying reasoning and/or causes or assumptions.
- For problem analysis, drawing a simple problem tree might be helpful.
- Summarize the statements or problems made to make sure you have understood them well.

5) Start to develop a business case. Based on the analysis of the current situation (1) and (2), we have developed a clear picture of the key problems the management faces. The stakeholder analysis complements this by indicating what HMIS might mean for the facility. Now a start can be made with developing a business case. Examples of the advantages are:

- ✓ Time-saving;
- ✓ Additional revenues as more patients can be served;
- ✓ A reduction in paper work, which saves a lot of money that would otherwise be spent on stationary;
- ✓ The work flow is simplified;
- ✓ Fast and reliable communication;
- ✓ Heightened efficiency.

The business case is a simple listing of the advantages - or disadvantages - of introducing HMIS within the health facility as an organization. First, you make a qualitative list and then afterwards you try to quantify it, most likely using very rough estimates. Nevertheless, it represents a starting point and the details can be filled in later. Such a list could look like this:

Advantages:

List of
1...
2...
3... etc.

Estimation of additional income/possible saved time (which can be expressed as salary costs saved), additional costs incurred by the HMIS.

Disadvantages:

1...
2...
3... etc.

On the basis of the business case, the management can get a clear picture of what they can expect from an HMIS and what their priorities are.

Against this background it becomes possible to discuss the problems/obstacles that the management of the health facility anticipates, for example:

- Staff turnover;
- Resistance to change;
- Priority (this can be *their* priority and not a staff priority);
- Power problems;
- The educational level of the staff: some staff members are not well-educated;
- Fear of new technology (technophobia).

It is very important to listen carefully to this. Only take away worries if this can be backed up by proven experiences, and do it gently. Otherwise take any worries that are expressed very seriously.

Also, point out how the participatory approach taken (in this guide) has been successful. Be clear about the broad steps involved: contract, requirement analysis, training, joint workshop, detailed implementation plan and time schedule, implementation, follow-up.

Another desirable output would be if management commits itself to remunerating staff who are performing better as a result of using the HMIS. In practice, this is rather difficult for the hospital management to commit to. However, a Pilot Project Hospital case study shows that commitment to additional remuneration is possible, and even required, to make the HMIS function well. At this point, it is also important to build up commitment step-by-step by communicating, involving, and finally obtaining the full commitment of the target group.

Inform management about ICT: describe the kinds of applications that are offered by the Evangelical Lutheran Church in Tanzania (ELCT) ICT & Change Management Team. Start elaborating upon a very simple business case:

Who is involved: Hospital Administration staff.

Time required: 1 day.

Deliverables:

- Those in charge will understand the benefits of a participatory approach. They are willing to share part of the additional benefits generated by an HMIS, are receptive to the concerns of the staff, and are willing to allay these concerns as much as possible. Leadership fully supports the ICT and Change Management Team to implement the participatory approach of the joint workshop mentioned in step 8.
- The main deliverable of this step is a well-informed management team with a clear picture of the potential that an HMIS could bring to their business and what they can expect of the ICT & Change Management Team.

Step 3: Contract

Objective: To enter into a formal business relationship; to ensure well-informed decision-making by management; Be clear about the possible budget involved and the broad steps that have to be taken (compile a skeleton implementation plan). Step 3 can be very short (by simply making a Memorandum of Understanding (MoU) which states that the hospital wants to work with the ICT Technical & Change Management Team and, if they do not agree to the final implementation plan, which is the result of step 9, they will reimburse xx amount to the ELCT Change Team for their work: however, please bear in mind that the amount to be reimbursed could be symbolic, but remember that free goods are often not appreciated.

In the event of a contract being drawn up on the basis of an Information Plan (objectives or functionalities, specification of requirements, global budget and implementation plan), then steps 3 and 4 will become largely integrated.

Activities:

Define objectives (short-term and if possible longer term) and translate them into functionalities for the HMIS:

- ✓ Patient registration;
- ✓ Billing;
- ✓ Lab tests;
- ✓ Accounting.

Define the requirements for the hospital, such as:

- ✓ A LAN set-up;
- ✓ A reliable internet connection;
- ✓ Hardware availability like computers, UPS, power protectors, etc.;
- ✓ Power supply, back-ups and the proper configuration of the power supply;
- ✓ Staff trained so that they have a basic knowledge of computers;
- ✓ Set time for HMIS training: 2-3 weeks depending on the number of staff the facility has;
- ✓ Start training for the HMIS.

What is required from management and from the staff?

- ✓ Prepare the requirements listed;
- ✓ Prepare the staff schedule for attending the training session;
- ✓ Prepare the budget for the LAN set-up;
- ✓ Preparation for purchasing the computers and other hardware required;
- ✓ Commitment from and co-operation between the management, the ICT & Change Management Team and the staff in general;
- ✓ Support for the staff during the change process.

And what will the ICT & Change Management Team do? (clearly describe its responsibilities).

- ✓ Arrange the training (HMIS) date with the hospital management;
- ✓ State how long the training session will take;
- ✓ Provide a training session about the software (care2x);
- ✓ Assess the training session (an evaluation can be carried out through the special questionnaire forms that can be filled out by the trainees.);
- ✓ This will help to evaluate the training session and correct any weaknesses of the trainer;
- ✓ Do change management *after* or *before* the training session; this will slowly reduce any resistance/reluctance;
- ✓ Organize and coordinate the joint workshops;
- ✓ Support the hospital through the transition period to the point where they have a full-fledged computerized system;
- ✓ The change management team will set up a steering committee at the facility which will be responsible for all change management issues within the facility and will motivate others and lead others to the change process.

Provide a rough indication of the costs involved (initial investment and exploitation costs, also in terms of staff efforts).

- ✓ The ICT & Change Management Team should indicate the costs that will be incurred by the hospital such as the purchase of the computers which is a maximum of 6-10 computers, depending on the size of the facility (these computers are for all points of service delivery).
- ✓ The facility should set up a Local Area Network (LAN) to allow the patient information flow through the HMIS to flow accordingly from one point of service to another. The

facility should be responsible for its internet bills so as to allow the server to be accessed remotely.

- ✓ The facility should be responsible for training its staff so that they have a basic knowledge of computers.
- ✓ The hospital managers should be responsible for supporting their staff during the transition period right through until the computerized system is up-and-running.

The contract stipulates that the management team will commit itself to the process and if they do not agree to the final implementation plan (which is the result of step 9), they will reimburse xx amount to the ICT & Change Management Team for their work: note, the amount to be reimbursed could be symbolic but bear in mind that free goods are often not appreciated.

- ✓ The agreement should be made between the hospital management staff or the Diocese and the ICT Unit.
- ✓ This will clearly state that if the hospital does not agree to the final plan then they should pay a fixed amount of money to the ICT Unit for Change Management as compensation for the work they carried out.
- ✓ This will help the hospital management staff to be more committed, responsible and accountable.
- ✓ The contract should be signed before the final implementation.

Start recruiting ICT technicians for the hospital. There are two options here:

- ✓ The facility can recruit qualified IT personnel, which is often the best solution if the financial position of the facility allows this.
- ✓ The ICT & Change Management Team can train one person at the facility in IT issues. This person will be responsible for all the hardware issues and simple troubleshooting within the facility and for reporting when an internet fault occurs that is beyond his or her capability.

The ICT technician should receive training in the HMIS software as well so that he or she can also train newly-employed staff members at the facility.

Who is involved: hospital management staff and top level management officials (Diocesan).

Time required: 2 days for the ICT & Change Management Team; 0.5 day for hospital management staff and diocesan officials.

Deliverables: A contract with a well-informed hospital management team (and agreed on by the Diocesan) that have clear expectations about the services that *will* be provided (and the services that will *not* be provided) by the ICT & Change Management Team, along with the investments that will have to be made and the effects that an HMIS implementation will have on their organization. This way, both parties will be clear about their roles and responsibilities

Step 4: Audit and definition of requirements (with management)

Objective: to collect all the relevant information for the implementation plan.

Activities: To avoid unrest and questions among staff, it is good practice to inform them of the objective of the exercise, the participatory process, and the training course. This can be done through a leaflet or a meeting, after the Morning Prayer for example. Use your past experience to remove any lingering doubts and concerns such as: "Because of ICT I will lose my job", etc. This meeting should take no longer than 30 minutes to one hour.

This step is largely an elaboration of the requirements already mentioned in the previous 'Step 3'. Based on the objectives, define the required functionalities (see Step 3). Analyse patient

flows and, if needed, make improvements. Analyse other bottlenecks in the workflow of the staff, and make improvements. Analyse information flows.

Define the network and other ICT architecture

- ✓ Should be able to identify whether the internet is up and running (reliable connection) – to allow for distance/remote support and troubleshooting.
- ✓ Do they have a Local Area Network (LAN)?
- ✓ Do they have an internet connection?
- ✓ What is the status of their internet?
- ✓ Are they connected all the time?
- ✓ Is it up or is it up-and-down?

Carry out a Human Resources Audit

- ✓ How are the staff?
- ✓ Are they aware of ICT?
- ✓ When you have meeting with the staff it is easy to identify how skilled they are and how knowledgeable they are about ICT?
- ✓ You should be able to identify how many staff members need training in basic computer skills;
- ✓ Identify how many staff members will attend the training course on HMIS;
- ✓ Arrange the schedule for training with the hospital management team;
- ✓ The hospital management team will help to schedule the staff for training.

Carry out an ICT infrastructure Audit

- ✓ Determine whether the required equipment is available and if it is in good condition;
- ✓ What is the status of their computers?
- ✓ Do they have power protectors and power back-ups?
- ✓ Here you should do the equipment audit and requirement analysis, check what they have (equipment) and which equipment is related to ICT;
- ✓ Do they have computers at all points of service delivery? Or do they have computers at the points where they intend to implement the tool?
- ✓ What is the status of the equipment they have?
- ✓ How are the staff? Are they aware of ICT? When you have meetings with the staff it is easy to identify how skilled they are and how knowledgeable they are about ICT?

Maintenance plan

- ✓ Training staff for maintenance;
- ✓ Trouble-shooting at a distance;
- ✓ Spare parts and replacements;
- ✓ Depreciation and regular maintenance of IT infrastructure;
- ✓ Regular maintenance of power infrastructure.

Data security and back-up policy

- ✓ Rules to protect the security of data;
- ✓ Back-up policy;
- ✓ Make a list of activities for implementation;
- ✓ Define who is responsible for each activity;
- ✓ Define the time planning: when to start and when to stop;
- ✓ Make a cost estimate and a cash flow projection;
- ✓ Relate the cost estimate to the business plan (step 2).

Who is involved: Hospital Management, Staff interviewed.

Time required: 3 days.

Deliverables: A good idea on what is a feasible and acceptable preliminary implementation plan, and a more elaborated but still preliminary business plan. This guides the briefing of the management and is an input for the facilitators in step 8. However, it will have to be redone based on the results of step 8! Because step 8 is not to make people “swallow the implementation plan”, but rather to *make* the implementation plan. Step 4 only serves to help the ELCT ICT & Change Team prepare themselves for the following steps.

Step 5: Set up the classroom and start the training

Objective: to train the staff in basic computer skills and HMIS (Care2x) and to ensure that they are comfortable with computers.

Activities: Training staff in computer skills in general, including enhancing their typing speed and later on making them proficient in Care2x. The hospital management team should be given special attention in the training course. This is because top level management are often reluctant to mix with their junior staff members out of fear that gaps in their own understanding of ICT will be exposed.

Staff training: Train the junior staff members separately as junior staff are also uncomfortable about mixing with the senior staff members. Staff members will be encouraged to open e-mail accounts and chat engines to make them familiar with computers. Change management issues should be addressed during each training session. At each training session change management can be carried out at the beginning of the session or at the end; this will reduce or eradicate any misconceptions and break down any resistance to change.

Who should be involved? Everyone (staff members and management).

Time required: 3 weeks, depending on the number of staff members working at the facility.

Deliverables: Enthusiastic hospital managers and staff members who will receive a certificate when they complete and pass the course.

Step 6: Collect and analyse critical data for a joint workshop

Objective: to have basic data for leadership training and to prepare the joint workshop.

Activities: By now, the ICT & Change Management Team will be well-acquainted with the health facility. The data from the previous steps (Preliminary Business Plan, Preliminary Implementation Plan) will have been gathered so the ICT Technical & Change Management Team will be fully aware of the expectations, as well as any resistance to change and hurdles that have to be overcome. To make the HMIS successful, four essential elements are needed:

1. A joint vision that binds hospital staff together and that is worth pursuing;
2. A workforce that understands and likes HMIS;
3. Additional remuneration if additional income is generated;
4. Transparency.

These elements are absolutely critical. Therefore, management has to think about how it can contribute to elements 3 and 4 above: ‘additional remuneration if additional income is generated’, and ‘transparency’ and, more generally, how they can involve and encourage staff to think along in realising the joint vision. Therefore, management should be willing to let the staff participate fully in developing a joint vision and, based on that, adopt a final implementation plan.

The final implementation plan reflects the input of everyone and hence their commitment to it. The ICT & Change Management Team should prepare management for this as it might be novel and scary for them. Consequently, they have to see the benefit of this approach.

Who should be involved? Hospital management

Time required: 1 day (or two ½ days).

Deliverables: Full adherence to the participatory approach and the willingness of management to realise the four above-mentioned key elements, including a willingness to drastically change the implementation plan.

Step 7: Joint workshop

Objective: To reach a clear understanding and **vision** by staff about what HMIS can do for them so that it makes sense to them. To have ownership. To have a vision and have clear priorities set out. A general acceptance of, and agreement on, the priorities and changes that are required.

Nature of the intervention

The eleven different phases of the workshop:

1. Explain objectives and participatory approach;
2. Demo of ICT applications, especially HMIS;
3. What are the present information and communication flows and what information do you need to make your work easier and better? Presentation followed by discussions in working groups;
4. Develop a vision: how will the hospital look when it is using HMIS (Working Groups and Plenary Session).
5. Set priorities (if needed). Discuss problems or obstacles.
6. ELCT Change team presents the main points of the implementation plan and outlines the expected results and when they should take place.
7. Discussion about the implementation plan and improvements to it, including the time-line and the deliverables. Reach agreement on the plan.
8. Set up change teams per department. Set up a Steering Committee of coordinators' change teams plus management. Agree on the tasks and responsibilities of the change teams.
9. Define weekly meetings, delegation of authority by management, and reporting, and define how users can bring forward their problems and complaints about the HMIS, etc.
10. Sum up the agreements reached so far, the set time-line and deliverables.
11. Make a very nice and surprising closure to the workshop!

Some background information about the workshop and how to facilitate it.

The workshop should enable all staff to develop a full understanding of the change involved (including the emotional aspects). Staff members have to be able to 'make sense' of the HMIS. They should be able to raise any questions and doubts they might have (such as, 'because of ICT I could end up losing my job.' etc.).

These changes apply at various levels: a different or more intensive collaboration between different departments. For example, a doctor describes lab tests and expects a strict and more timely workflow by the lab. Or the lab wants the doctors to respect their 'rush hour' if they also have to work for the HIV/AIDS clinic, for example.

Positions: Will my position as a head of a section change?

Roles: What will a nurse have to do with regard to the HMIS? This might be the most important change, with new procedures and new skills required.

The workshop is highly participatory to ensure that staff can speak out as well as obtaining their input about what they think the best solution would be. To ensure a participatory atmosphere, the participants should feel safe and be invited to air their feelings openly. For others, it is good to listen and not to react! The ELCT facilitators therefore encourage people to speak up and clamp down on discussions or arguments between individuals. Staff members can be open-minded about identifying their management roles and feel free to mention the weakness of their management. Build total commitment among leaders and their staff. Always start with the top level to front-liners.

Executives	These can be Diocesans who can determine the actions it would take to achieve the desired change with regard to HMIS.
Managers	These are the medical doctors in charge, as well as the administrators and the matrons. They should agree with the rest of the staff and the department heads on the target that has to be achieved (HMIS). They should make sure that all of their department's activities contribute directly to achieving the HMIS.
Supervisors	These are the department heads; they should make sure that all the tasks and activities carried out by the department that they supervise are achieved. They can do job allocation, so that every day there is one person who is responsible for capturing the data in the system. They should set a job allocation within their departments. They should make sure that every staff member in their department is accountable for the HMIS. This will give them a sense of ownership and accountability to the project.
Front-liners	These are the quick wins that are positive for the project. These are the ones that lead others to a computerized system. These are the champions/giants who can motivate others. They can be selected as members of the Steering Committee or as change leaders who will respond to ICT issues as and when they emerge within the facility. They can provide feedback to the ELCT- IT Unit.

Share the management roles

- ✓ Mention the units/departments with the number of staff members in each department.
- ✓ Acknowledge the heads of those departments.
- ✓ Acknowledge and define the roles of the department heads.
- ✓ Once everybody has spoken, then discussion can take place and decisions can be made.
- ✓ The ELCT change team is the facilitator and will not express its own viewpoint, however tempting that might be!

Based on this workshop, the ICT & Change Management Team prepares a short account of the meeting, with a lively wording of the vision developed - a video could help here - and a list of the decisions taken.

Based on this input, the Business Plan and Implementation Plan can now be finalised by the ICT & Change Management Team.

Who should be involved? All staff members, including hospital management staff.

Time required: 1 day.

Deliverables: A tailor-made, detailed implementation plan. In this plan, the scope of the HMIS implementation is described, along with the process flows, the data definitions and the data that has to be collected and distributed; the purpose of data collection and data processing; the management reports produced; a description of the administrative organization, including a time-line and a description of the responsibilities for implementation.

Step 8: Implementation

In annex 3, additional information can be found about the implementation phase (step 8 to 11).

Objective: to have a fully implemented HMIS system in place that is 100% operational.

Activities:

Purchase and installation

Based on the feasibility study (see annex 6), define the additional equipment, networking, power supply and security required. Obtain equipment only from reliable suppliers. Do not look only at the price, but also at quality and after-sales services (for questions see also www.afyamtandao.org). The contract generally also includes the installation. Have an IT expert check the proper installation, before making the final payments.

Testing

By this time, all the requirements are now being met by the hospital and a requirement analysis for the software has been done. All we need to do now is test for what has been customized.

Plan for usage

The ICT & Change Management team and hospital management should agree on the plan for usage of the software. Normally, the hospital is advised to start implementation in a department-by-department approach, starting with the Registration Department for one month, and continuing with the other departments as well. This is because if 100% of the patients are not registered, other users of the tool in different departments cannot access the patient flow in their departments.

Monthly feedback sessions with management

Who should be involved? Staff and Management. ICT & Change Management team.

Time required: 2 to 3 months.

Deliverables: HMIS up-and-running and tested. Redesigned work processes implemented. Change teams of the health facility are fully operational and empowered and backstopped by the ELCT ICT & Change team.

Step 9: Trial period A

Objective: to start using the HMIS and become familiar with it.

Activities:

Start of usage, manual back-up available.

- ✓ It can start with registrations in the Out-Patient Department (OPD) for one month, and then later to the other departments;
- ✓ This is to monitor that at least 99% of the patients have had their details captured in the system which will enable other departments to access patient information as well;
- ✓ Additional *ad hoc* training;
- ✓ Instant trouble-shooting;
- ✓ Make a Maintenance Plan and put it into practice;
- ✓ Develop and implement procedures for trouble-shooting;

- ✓ Ensure that the use of the HMIS is monitored;
- ✓ Monthly feedback sessions with management;
- ✓ The maximum down-time for the HMIS is two hours.

Who should be involved? Specific staff members.

Time required: 1 month.

Deliverables: HMIS is up-and-running. Some satisfied staff members who are doing their work supported by the HMIS. These employees are fully supported by the hospital's ICT staff and the ICT & Change Management Team so that any problems they encounter are solved within 2 hours. Work processes run effectively. Change teams of the health facility are active, effective and satisfied.

Step 10: Trial period B

Objective: to transfer from a manual system to a fully computerized HMIS.

Everybody is using the HMIS now. Progress problems are evaluated every day or once a week:

- ✓ An evaluation should be done by the ICT Unit on a daily basis through remote access as well as once a year by filling out the questionnaires;
- ✓ In cases where there is no data entry we should make a follow-up (monitoring);
- ✓ A monthly evaluation should be carried out and staff members, hospital management, and the ICT Unit should all be involved in the process;
- ✓ Manual back-up is not available (only for emergencies, like when there is no electricity);
- ✓ Make adaptations if needed and iron out problems;
- ✓ Ensure that every use of the HMIS is monitored, together with the change teams of the hospital. Thereafter, the breakdown incidents should be less than three a week and for a maximum of 1 hour only;
- ✓ Maximum down-time for the HMIS is one hour per week;
- ✓ Start-up made with remote trouble-shooting;
- ✓ Special attention might be required to ensure that the accounting packages function well, including staff training.

Who should be involved? Hospital staff and management. ICT & Change Management Team.

Time required: 2 months.

Deliverables: The HMIS is up-and-running; there is no manual system any more (except as a back-up in case of emergencies) and 95% of all employees are satisfied. Employees are instantly supported by the ICT staff and the ICT & Change Management Team.

Step 11: (Distance) Support and trouble-shooting

Objective: to ensure that no interruptions occur for more than thirty minutes.

Who should be involved? Hospital staff and the ICT Unit.

Time required: Two months.

Deliverables: Distance trouble-shooting, down-time further reduced to less than one hour per month.

Step 12: Evaluation and establishing a business case

In Annex 5, additional information can be found about monitoring and evaluation.

Objective: to evaluate the exercise and extract lessons learned.

- ✓ Identify all the benefits and other advantages. Benefits and costs can now be checked against the initial business plan and the business plan can now be improved;
- ✓ Start using the HMIS as a tool for analysis and management;
- ✓ Materials and suggestions provided by the ICT & Change Management Team;
- ✓ Evaluation of questionnaires for users;
- ✓ Evaluation for patients is not yet prepared, but could be considered.

Who should be involved? Management, staff, IICD M&E team, ICT & Change Management Team.

Deliverable: All parties involved could reflect on their experiences (compare them to their expectations) and learn from it. The different parties can also bring forward their own ideas for new improvements.

Step 13: Lessons learned

Objective: To wrap-up and document lessons learned. To make a final evaluation report and a business case and present these to management. To suggest areas for further improvement.

After integrating the comments from management, present the final evaluation report to the staff and discuss with the change team how to implement the latest improvements.

The ICT & Change Management Team refines the 'Change Guide' and the supporting documents. The ICT & Change Management Team informs AfyaMtandao and IICD on the lessons learned for further dissemination.

Who should be involved? Management, staff, ICT & Change Management Team.

Time required: 0.5-day session. This activity could be done six months after the implementation has begun.

Step 14: Continuous improvement

Objective: To develop a process of continuous improvement.

The data generation allows better reporting and an improved analysis of the data. This is helpful for quicker reimbursements from the Health Insurance Schemes and Government. It also allows for further improvements in management. Possibilities for this include:

- ✓ Management training in analysing and managing data;
- ✓ Further improvements in management reports;
- ✓ Further improvements in financial reports;
- ✓ Data analysis to realise specific improvements;
- ✓ Comparison with other health facilities.

To initiate changes, use can be made of the successful HMIS experience and the team dynamics that have been developed. This can be initiated in a number of different ways, but the best option might be a participatory approach:

- 1) **Create improvement teams.** That is, use the same change teams who guide a discussion within their departments on how to improve the performance of their department. This could include small activities (for example: change the workflow, arrange tasks to be done by one person in a handier way, etc. Change teams might need a little training and help to realise this. Their activities, and especially the results, have to be rewarded by management.
- 2) **Management, based on the data, looks at the different possibilities to improve.** Management might be assisted in data analysis.

ANNEX 1: Example of a feasibility study for a Hospital Management Information System

Project proposal

Implementation of Health Management Information System (HMIS)

‘This Hospital’

March 15th, 2009

<p>‘This Hospital’ This Synod Health Department P.O. Box 48 CountryName</p> <p>Contact Person Project Chairman FirstName LastName Principal Hospital Administrator Cel#: +xxx xxxx xxxxxxxx Tel#: +xxxxx xxxxxxxx Email: xxxxx@gmail.com</p>	<p>IICD Nic Moens Country Programme Manager nmoens@iicd.org PO Box 11586 2502 AN Den Haag The Netherlands www.iicd.org</p>
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Table of contents

1.	Executive Summary.....	24
2.	Background and Analysis of current situation.....	24
2.1	Background of the project.....	24
2.2	Project owners.....	25
2.3	Analysis of the current situation: challenges and expectations.....	26
3	Project Objectives.....	27
3.1	Project objectives.....	27
3.2	Outputs and performance indicators.....	30
3.3	Stakeholder analysis.....	35
3.4	Levels of change and risks.....	36
3.5	Relation to policy of the owner and district/sector policy.....	37
4	Information analysis and Components.....	37
4.1	Information flow analysis.....	37
4.2	Optimization of work- & information flow.....	37
4.3	Functional and performance requirements.....	38
4.4	ICT infrastructure (hardware and network)	41
4.5	Power requirements & management.....	43
4.6	Software customization & release management.....	43
4.7	Human resources and training plan.....	43
4.8	Trouble-shooting and maintenance.....	45
4.9	Data security and back up policy.....	45
4.10	Change management plan.....	45
4.11	Integration of end-user feedback.....	45
5	Time planning.....	47
6	Organisation and management.....	47
7	Financial plan and sustainability.....	48
8	Appendices.....	51

Preface

This document is based on the change management guide for HMIS developed and tested in a number of facilities. The change management guide is attached as annex 1. This document serves as a working document to support that approach.

The implementation will start with 'This Hospital' and thereafter extended to its 11 Health Centres which are in 7 of 9 districts of the Central Region.

1. EXECUTIVE SUMMARY

'This Hospital' intends to implement a Health Management Information System in order to improve the capacity of the hospital to provide quality and efficient health care services to the community.

One of the main identified problems at 'This Hospital' is the unavailability of accurate and timely data. Without proper data, there is limited data analysis which affects the quality of decisions made. Also without proper data keeping, the hospital fails to accurately supervise and account for all the revenue collected. Furthermore, a data driven Hospital is more responsive to the end users, more accurate in its interventions, more accountable and fosters a learning environment that would promote the analysis of data closer to the points of data generation.

ICT have changed the way people store, retrieve, present and share information. This has improved the pace at which organisations performs their activities while reducing costs by taking advantage of knowledge and tools made available by this digital age. Streamlining organisational activities while improving responsiveness to clients need, has been one of the key distinguishing factor and adds competitive edge to modern organisation.

This Hospital has not been left aside with this digital age transformation and is compelled to abreast with the change in order to improve the capacity of the hospital to provide quality and efficient health care services to the community. This Hospital envisages the establishment of Health Management Information System based on the change management guide for HMIS developed and tested in a number of other church facilities.

This Hospital requests **Euro 30,998.46** as first year investment costs for the project from the Donor and hoping the project will start in June 2009.

2. BACKGROUND AND INFORMATION ANALYSIS.

2.1 Background of the Project

On 28th February 2009, a round table discussion was held at This Computer Library. Attending the meeting were This head of department, Nic Moens (the Country Manager and Lead Facilitator)

from IICD and Andrew Muga (Hospital Implementations Consultant from Tanzania). The main agenda on the discussion was how to improve the capacity of the hospital to provide quality and efficient health care services to the community.

The outcome of the discussion was a prioritized inventory of Hospital requirements and issues/problems that needed to be addressed in order to improve the quality of health care services and hospital management.

Further detailed interviews to Hospital Head of Departments were carried out in the following days after roundtable discussion then followed with another roundtable meeting at the computer room on 4th March 2009, from these interviews and the 4th March 2009 meeting it was concluded that the major problem facing the hospital is the unavailability of accurate and timely data. Without proper data, there is limited data analysis which affects the quality of decisions made. Also without proper data keeping, the hospital fails to accurately supervise and account for all the revenue collected.

ICT has been identified as a critical tool in development today and has vast potentials in improving the service of health delivery. This Hospital envisages the establishment of Health Management Information System.

Change Management was highlighted as most critical component for a successful implementation of the Health Management Information System, therefore This Hospital will implement the Health Management Information System based on the change management guide for HMIS developed and tested in a number of other church facilities in Tanzania.

2.2 Project owners

This Hospital is the initiator and owner of project although the project is expected in future to be rolled out to its 11 health centres and some of the existing 10 Government Health Centres in This area.

This Hospital belongs to the health department of the Church of Central Africa Presbyterian (CCAP), the health department is one of the 13 departments of the Church of Central Africa Presbyterian (CCAP), This Synod.

This Synod Health Department is a member of Private Hospitals Association of The Christian Health Association in CountryName (CHAM). CHAM is an ecumenical organization owned by the Episcopal Conference of CountryName and CountryName Council of Churches, and is responsible for 163 health units in CountryName.

Together with other CHAM units, This Synod Health Department provides up to 37% of the total national health delivery services. Of the 163 units under CHAM, 12 are owned by This Synod Health Department which is 7.3%. Of the 18 full hospitals under CHAM, This Hospital is the leader in ophthalmic services, and is among the top five in the training of nurses. The reputation of This hospital goes even beyond the borders of CountryName.

On the basis of the facts above, This Hospital has identified the need to incorporate various forms of Information Technology into its programs and operations to increase efficiency, transparency, coordination and in general the ability to deliver a higher quality of service to the end users.

2.3 Analysis of the current situation

This hospital is located at the southern foot of This Mountain, which is on the northern end of the Kirk Range of mountains in the central part of CountryName. From Lilongwe City, the Capital of CountryName, This hospital is 50 km. It is approached by a good tarmac road. This is a 220-bed hospital capable of all common and major medical cases of a normal hospital setting in CountryName. Only very complicated cases are refereed to other bigger hospitals in CountryName like Kamuzu and Queen Elizabeth Central Hospitals. It has medical, surgical, pediatrics, laboratory, x-rays OPD and PHC departments supported by a human resource department, and workshop departments.

The hospital provides employment to over 450 staff where some of them get paid their salaries from the CountryNamean Government through CHAM.

At present most processes are manual and data is collected and documented manually. Although the data collected is of immense usefulness, the process is tedious and human error often compromises the reliability of data collected.

Among the underlying problems AT This Hospital in delivering quality and adequate health services to the community is the lack of adequate data management and communications, and examples of the most common problems are

- Lack of adequate patient records
- Tedious and tiresome processes in reports compilations
- Duplication of activities and processes
- Lack of information sharing between departments
- Poor internal communications
- Lack of adequate employee records
- Lack of proper drugs/medicine ordering and distribution system
- Lack of proper system to monitor drug stock levels, expiry dates and stock reconciliations

- Lack of proper patient billing systems leading to loss of income through improper debtor records
- Payroll system in place is unable to properly manage the 450 employees in place

3. PROJECT OBJECTIVES

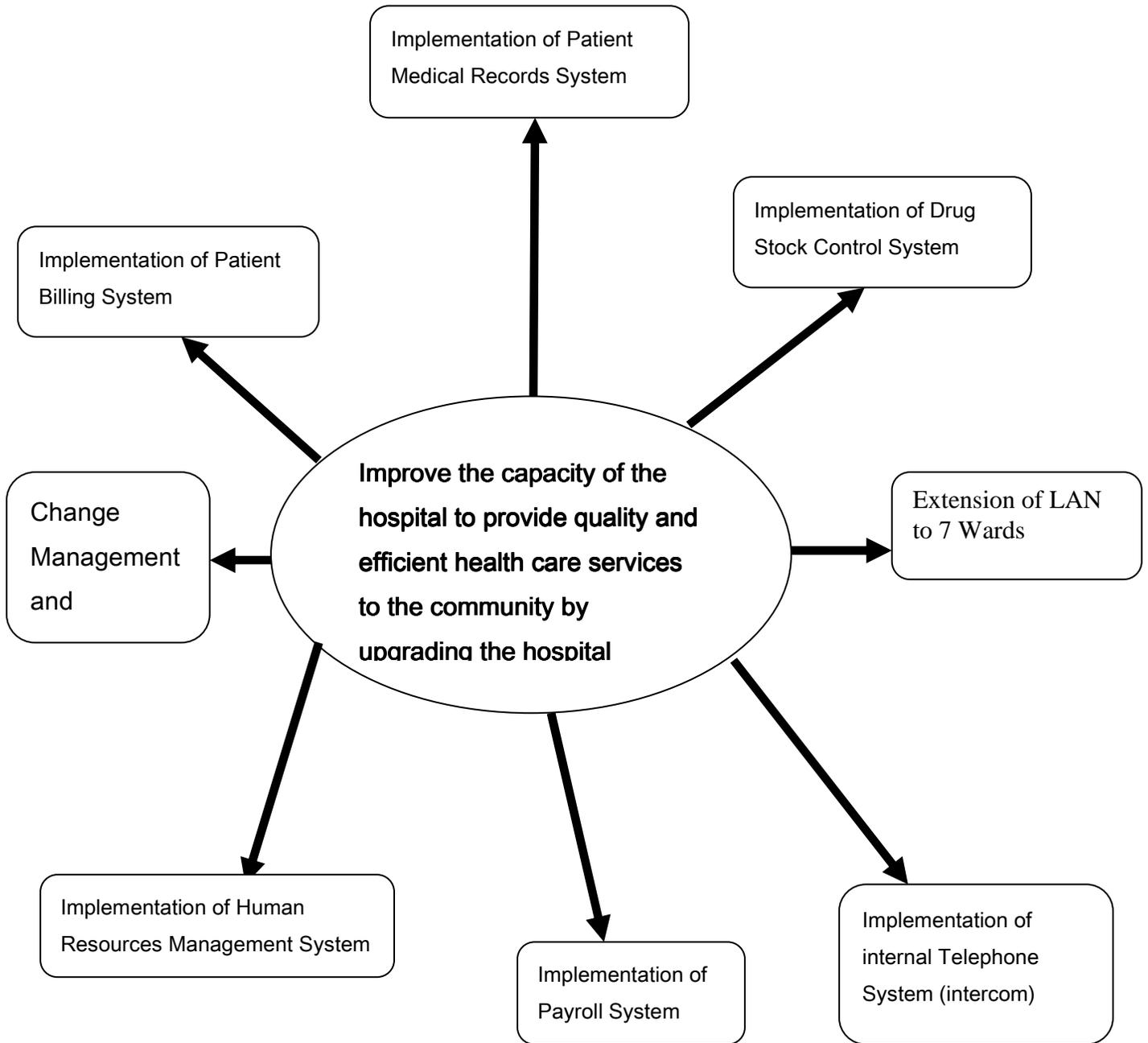
3.1 Project objectives

The key project objective is to improve the capacity of the hospital to provide quality and efficient health care services to the community by upgrading the hospital management systems and processes. This is expected to result into improved patient care, better hospital management, and revenue collections, fast and accurate reporting. To do so there is a need for improved processes and sharing of data at the hospital. Sharing of data enables better problem analysis and decision-making.

Moreover, enhancement of procedures of data collection based on collective and comparative data collection leads to greater collaboration and coordination between the hospital departments. As a result, greater time and resource is spent on analyzing the data and taking the appropriate actions, rather than merely collecting the data. Having better data makes it easier to coordinate activities regarding the hospital management issues. That means the actual guidelines of collaboration have to be streamlined and enhanced.

Sharing of data implies to provide feedback on budgets allocated to the hospital departments. ICT could be helpful in being more accountable to the Health Department.

With a greater amount of data and information, there is better accountability at all hospital departments and in every aspect of health service delivery. Financial accounting is automated and the procedure of revenue collection and expense allocation is formalized, thus reducing financial leakages.



Specific Objectives

- A. **Implementation of Patient Medical Records System:** A system for tracking and recording patients' medical records will be installed at the out patient and in patient registration points, OPD clinics, Wards, Laboratory, Surgery, Children and Mothers Health Care, Family Planning, PHC and HIV units. The Patient Medical Records will streamline the process of data collection and enable each department to transmit this data to the central hospital administration office as well as to their respective heads. It will also enable each department to analyse their own data and self-evaluate their effectiveness as well as health trends in their departments.

- B. **Implementation of Drugs and General Store Inventory Control System:** An inventory and Stock Control system will be installed at the This Main Drug Store, Dispensary and other drugs outlets and at the General Store for non medical items. The system will track the suppliers, orders, re ordering processes, expiry dates and stock balances.

- C. **Implementation of Patient Billing System:** A Patient Billing System will be installed at the revenue collection points to enable the hospital to accurately supervise and account for all the revenue collected. The system will track the patient bills, debtors and daily cash collections. .

- D. **Implementation of Human Resources Management System:** A Human Resources Management System will be installed in the HR Department to manage the existing over 450 This Hospital employees. This will be a powerful management tool for streamlining and coordinating an organization's human resources, the system will enable This Hospital decision makers, human resource officers and heads of departments to manage human resources information to support efficient, equal and sustainable human resource deployment. It will also support in producing, storing and updating human resource information and particulars, helping to identify, clarify and prioritize human resource issues. It will further supports participatory decision-making and formulation of human resource deployment strategies, enhances implementation of action plans pertaining to human resource recruitment, training, awarding and promotion, accelerating the production of various reports and supports in monitoring and evaluation of various achievements.

- E. **Implementation of Payroll System:** The Payroll System will manage and administer the entire Payroll and Taxation processes and automatically tracks the earnings, deductions and benefits for the purposes of reporting to Employees, Government Agencies, Accounts Department and Management. The system will also manage Costing Distribution, Payroll History Tracking; the system will be integrated to the General Ledger, Financial Systems and other Human Resources Management system. The system will enable This Hospital to accurately and efficiently manage the complex salary processes for the over 450 employees.

- F. Implementation of Internal Telephone System (inter-Com):** An Internal telephone system consisting of fixed telephone handsets and local switching will be installed to facilitate the internal communications between departments, wards, clinics and offices. This will automatically cut internal communication costs since the internal system will be free of charge.
- G. Local Area Extension to nursing wards:** A total of 32 new points will be installed to the nursing wards i.e. Surgery, Theatre, Maternity ward, Male ward, Female ward, Tuberculosis Ward, Paediatrics 1 and 2 Wards.
- H. Change Management and Knowledge Transfer:** This is the process where organisational procedures change with the new flow of information and new procedures that are aided by ICTs. Introduction of ICTs will completely change the way people conduct themselves and carry out their responsibilities. The main concept here is to ensure that there is continuity between technological change and organisational change for long term sustainability and acceptance of ICTs. The change management process will adopt the 14 steps of change management guidelines backed up by supplier knowledge transfer to This hospital staffs.

3.2 Project outputs and performance indicators

Objective A: Implementation of Patient Medical Records	
Pre-requisite:	
<ul style="list-style-type: none"> • Patient Medical Records procured and operational • User formal training on how to use Patient Medical Records • ICT Support staff formal training • Hardware procured and installed 	
Outputs	Performance Indicators
<ul style="list-style-type: none"> • Trained and motivated This staffs ready to use the system on their daily work • Patient Medical Records installed in Server and workstations at Registration, OPD/IPD clinics, Laboratory and other health clinics. • User manuals and quick guides in place • Trained and motivated ICT department staff ready to support and maintain the system • Backup plan in place • Touch screen computers, desktop computers, barcode scanner, barcode 	<ul style="list-style-type: none"> • This hospital staffs using the patient medical records system • Patient Medical Records System running without failure for 99% of its operations. • Quick guides attached on the walls to assist users • ICT staffs departments solving technical problems without the need of contacting the supplier for 95% of the problems raised. • Daily back up are taking place and one back up tape is kept off site. • User able to use the new hardware with minimum problems and hardware failures.

<p>printers installed.</p>	<ul style="list-style-type: none"> • Patient records are saved and retrieved from the system • Patient information shared between departments • Patient medical files are searched and retrieved quickly • Number of patients served increases from the daily average of 185 to 200. • Data collected is accurate by 99%
<p>Objective B: Implementation of Drugs and General Store Inventory Control System</p>	
<p>Pre-requisite:</p> <ul style="list-style-type: none"> • Drugs and General Store Inventory Control System procured and operational • User formal training on how to use the system • ICT Support staff formal training • Hardware procured and installed 	
<p style="text-align: center;">Outputs</p>	<p style="text-align: center;">Performance Indicators</p>
<ul style="list-style-type: none"> • Trained and motivated This staffs ready to use the system on their daily work • Trained and motivated ICT department staff ready to support and maintain the system • User manuals and quick guides in place • Backup plan in place • Desktop computer, barcode scanner, barcode printer, document printer and palm computer installed. 	<ul style="list-style-type: none"> • This hospital staffs using the inventory system • Inventory System running without failure for 99% of its operations. • Quick guides attached on the walls to assist users • ICT staffs departments solving technical problems without the need of contacting the supplier for 95% of the problems raised. • Daily back up are taking place and one back up tape is kept off site. • User able to use the new hardware with minimum problems and hardware failures. • Drugs order is processed using the system • Stock balance and expiry dates are tracked using the system. • Drugs Data is accurate by 99%
<p>Objective C: Implementation of Patients Billing System</p>	
<p>Pre-requisite:</p> <ul style="list-style-type: none"> • Patient Billing System procured, installed and operational • User formal training on how to use system • ICT Support staff formal training 	
<p style="text-align: center;">Outputs</p>	<p style="text-align: center;">Performance Indicators</p>

<ul style="list-style-type: none"> • Trained and motivated This staffs ready to use the system on their daily work • Trained and motivated ICT department staff ready to support and maintain the system • User manuals and quick guides in place • Backup plan in place 	<ul style="list-style-type: none"> • This hospital staffs using the patient billing system • Patient billing System running without failure for 99% of its operations. • Quick guides attached on the walls to assist users • ICT staffs departments solving technical problems without the need of contacting the supplier for 95% of the problems raised. • Daily back up are taking place and one back up tape is kept off site. • Users able to use the new hardware with minimum problems and hardware failures. • Patient bills are recorded and processed electronically • Patients received electronic receipts for the payments made • Patients can deposit advance payments • Debtors records easily tracked • Billing reports integrated to financial accounting system in place (Sage accounting). • Billing Data is accurate by 99%
<p>Objective D: Implementation of Human Resources Management System</p>	
<p>Pre-requisite:</p> <ul style="list-style-type: none"> • Human Resources Management System procured, installed and operational • User formal training on how to use system • ICT Support staff formal training • Hardware procured and installed 	
<p style="text-align: center;">Outputs</p>	<p style="text-align: center;">Performance Indicators</p>
<ul style="list-style-type: none"> • Trained and motivated This staffs ready to use the system on their daily work • Trained and motivated ICT department staff ready to support and maintain the system • User manuals and quick guides in place • Backup plan in place • Employee Records captured in the system 	<ul style="list-style-type: none"> • This hospital staffs using the HR system • HR System running without failure for 99% of its operations. • Quick guides attached on the walls to assist users • ICT staffs departments solving technical problems without the need of contacting the supplier for 95% of the problems raised. • Daily back up are taking place and one back up tape is kept off site. • Employee records are available electronically and

	<ul style="list-style-type: none"> can be shared between the departments Recruitment, Appraisals and training decided based on the system Staff records are accurate by 99%
Objective E: Implementation of Payroll System	
Pre-requisite:	
<ul style="list-style-type: none"> Payroll System procured, installed and operational User formal training on how to use system ICT Support staff formal training 	
Outputs	Performance Indicators
<ul style="list-style-type: none"> Trained and motivated This staffs ready to use the system on their daily work Trained and motivated ICT department staff ready to support and maintain the system User manuals and quick guides in place Backup plan in place 	<ul style="list-style-type: none"> This hospital staffs using the Payroll system Payroll System running without failure for 99% of its operations. Quick guides attached on the walls to assist users ICT staffs departments solving technical problems without the need of contacting the supplier for 95% of the problems raised. Daily back up are taking place and one back up tape is kept off site. Employees received pay-slips for their monthly salaries Payroll reports generated quickly and easily Payroll system shares information with financial system in place. Staff Salary details are accurate by 99%
Objective F: Implementation of Internal Communications System	
Pre-requisite:	
<ul style="list-style-type: none"> Procure and install VOIP telephone system User formal training on how to use system ICT Support staff formal training 	
Outputs	Performance Indicators
<ul style="list-style-type: none"> Trained and motivated This staffs ready to use the system on their daily work Trained and motivated ICT department staff ready to support and maintain the system User manuals and quick guides in place 	<ul style="list-style-type: none"> This hospital staffs using the internal telephone system to communicate free of charge Quick guides and telephone extensions attached/fixed on the telephone handset front surface ICT staffs departments solving technical problems

<ul style="list-style-type: none"> • 25 VOIP handsets installed • 2 VOIP operators consoles installed • Telephone switching server software installed in desktop computer • Power back up system for telephone system installed 	<p>without the need of contacting the supplier for 95% of the problems raised.</p> <ul style="list-style-type: none"> • Telephone system running for 99% of operations • Telephone system running for 8 hours in absence of power supply from the national grid.
<p>Objective G: Local Area Extension to nursing wards</p>	
<p>Pre-requisite:</p> <ul style="list-style-type: none"> • Procure and install a LAN extensions consisting of 32 LAN points 	
<p>Outputs</p>	<p>Performance Indicators</p>
<ul style="list-style-type: none"> • Local Area extension to the nursing wards i.e. Surgery, Theatre, Maternity ward, Male ward, Female ward, Tuberculosis Ward, Paediatrics 1 and 2 Wards 	<ul style="list-style-type: none"> • Surgery, Theatre, Maternity ward, Male ward, Female ward, Tuberculosis Ward, Paediatrics 1 and 2 Wards able to access main This network • LAN performs for 99% of the operational time
<p>Objective H: Change Management and Knowledge Transfer</p>	
<p>Pre-requisite:</p> <ul style="list-style-type: none"> • Follow and implement the 14 steps change management guide • Employ Data Manager • ICT Training Sessions 	
<p>Outputs</p>	<p>Performance Indicators</p>
<ul style="list-style-type: none"> • This Data Manager trained by the supplier in usage, support and design of the system. • Trained and motivated This staffs ready to use the system on their daily work • Trained and motivated ICT department staff ready to support and maintain the system • User manuals and quick guides in place 	<ul style="list-style-type: none"> • This Hospital able to sustain and support the ICT systems on their own after 3 years • This Hospital able to expand the systems on their own to other health facilities.

3.3 Stakeholder analysis

The categories of stakeholders are as follows; their benefits and disadvantages analysis follows thereafter this:

- a) This Hospital Staffs and Management – these are the direct beneficiaries of the project.
- b) This Synod Health Department – This hospital reports to This Synod Health Department.

- c) CHAM - This Synod Health Department is a member of Private Hospitals Association of The Christian Health Association in CountryName (CHAM). This Synod Health Department reports to CHAM on the hospital activities.
- d) Government – The CountryName and government pays the salaries of most This Hospital staffs through CHAM, the Government in return requires the hospital to submit reports for their daily activities especially on diagnosis and treatments.
- e) Public at large – The public confidence in hospital will raise due to transparency and speed brought in by the new system.
- f) District Health Office (DHO) – the DHO reimburses This Hospital for interventions in the essential health package through service level agreements on a fee for service basis.

The table below summarizes the categories of stakeholders and how they do benefit or affected by the proposed system.

Stakeholder	Advantages	Disadvantages
a) This Hospital Management	<ul style="list-style-type: none"> - Simplification of daily work - Better access to information/data : more easy reporting to stakeholders - Faster Internal communication - Better and faster decision making - Better controls, planning etc - Transparency 	<ul style="list-style-type: none"> - Vulnerability of system failure - Cost of Maintenance or replacement
b) This Hospital Staffs	<ul style="list-style-type: none"> - This Staffs will receive trainings intended to raise their skills and service delivery - Their daily work to be simplified - The system will increase transparency and thus make their work recognized. - Time saving and therefore can put up their saved time in other activities 	<ul style="list-style-type: none"> - Fear for redundancy, some hospital staffs may think that the system is aiming at reducing the number of employees at the hospital - Less opportunity to work around the system - Initially higher workload
c) This Synod Health Department	<ul style="list-style-type: none"> - Additional revenue - Improved hospital capacity to provide quality and efficient health care services - Timely and accurately reporting on hospital activities - Paper work reduction and 	<ul style="list-style-type: none"> - System Sustainability, the hospital will need to set aside funds to sustain the system

	<p>hence the serving in hospital money</p> <ul style="list-style-type: none"> - Fast and reliable communications - Financial security and more accurate medical stock control 	
d) Christian Health Association in CountryName (CHAM).	<ul style="list-style-type: none"> - Timely and accurately reporting on hospital activities - Timely information for planning and decision making 	-
e) The CountryNamean Government	<ul style="list-style-type: none"> - Timely and accurately reporting on hospital activities - Timely information for planning and decision making 	-
f) Public	<ul style="list-style-type: none"> - Less time spent at the hospital - Quicker retrieval of their medical records - Increased belief in the hospital due to transparency brought forward by the system. - Drugs availability due to accurate stock replenishment 	<ul style="list-style-type: none"> - Some may look at the new system as too much bureaucracy and the system that forces them to follow procedures.
g) District Health Officer	<ul style="list-style-type: none"> - Timely and accurately reporting on hospital activities - Timely information for planning and decision making 	-

3.4 Risk analysis

Risks involved during Implementations:

- a) Fear of Redundancy - some This staffs might misinterpret the implementation of HMIS system as reducing the processes and hence less number of staffs required per task.
- b) Unreliable electric power supply in the country, which may lead to implementation taking longer than expected.
- c) Computer illiteracy - users require might require longer time to practise using the system
- d) Resistance to change
- e) Systems integrations

Risks Involved after implementation

- a) Creating dependency on the technology (create non-ICT backup systems)

- b) Sustainability of ICT systems. Running cost is high. Inadequate human resources to run maintain and repair ICT systems.
- c) Abuse of Internet access. The access may be used for either useless purposes or to access content that is not appropriate.
- d) Unreliable electric power supply in the country, which may lead to data loss.

Remedies to the risks:

- a) ICT's bring change and health workers will have to get used to other ways of working
- b) Motivation and application of techniques to initiate full utilization of the project through supply of journals and seminars/workshops.
- c) Ensuring good security of equipments, standby power supply and regular maintenance
- d) Promoting the services available, to attract more customers in order to run the project.
- e) Follow the 14 steps of change management guideline developed and practised in the other church-based health facilities.

3.5 Relation sector policy

The project aims to practice the public private partnership policy by creating equitable and improved use of HMIS to government and church health facilities (CHAM), which is advocated by the government of CountryName. Furthermore, the issue of accurate data collection is of high national importance as stated by the government as well as several development partners.

4 Information analysis and Components

4.1 Information flow analysis

At present information flow is very similar to the hierarchical structure that exists in the hospital, see attachment – Organigram This Hospital.

As you see in the diagram, the departments seems to be isolated from each other, information sharing is minimal as a result the same type of data like patient registration details is captured in every department the patient visits. Likewise; the finance and administration department seems to be completely isolated from the main hospital activities and functions.

4.2 Optimization of work and information flow

The ideal system to be implemented should be able to bridge the information gaps existing between the departments and other units/divisions. Information sharing is one of the key objectives to this project. The sharing of information will reduce the amount work/processes within the existing workflow. For example, patient basic information should be registered only

once and get shared within all the departments instead of multiple registrations on every department this patient visits.

4.3 Functional and performance requirements

Component 1: Patient Medical Records System

The patient medical records should have the following functional and performance requirements:

- a) Keep records of patients and their medical details
- b) Keep records of cases, visits, diagnostics and treatments
- c) Doctors Appointment scheduling and tracking
- d) Track laboratory tests and results
- e) Track in patient records and ward activities (transfer, discharge etc)
- f) Track the activities of health clinics (HIV, mother and child, TB etc)
- g) Automatically generate Governments and other internal reports
- h) Output health data for analysis
- i) Track system User activities, security and access audit (audit trails)
- j) The system should be easy and simple to use, should support the use of touch screen at all data entry points where users have less computer experience.

Component 2: Drugs and General Store Inventory Control System

The Drugs and General Store Inventory Control System should have the following functional and performance requirements.

- a) Track providers/suppliers of medical and non medical items
- b) Drug Management and other stocked materials
- c) Support multi stock/store locations
- d) Track stock balance on each stock location (dispensary, general drug store, wards, health centers etc)
- e) Track expiry dates
- f) Track re ordering levels
- g) Track product history (bin card/stock card)
- h) Support the use of mobile computers (palm computers) to manage stock movements in and out
- i) Track system User activities, security and access audit (audit trails)

Component 3: Patient Billing System

The Patient billing system should have the following functional and performance requirements

- a) Manage income, billing and user accounts (cashiers)

- b) Track patient bills for cash and non cash transactions
- c) Allow patients or patients relatives to deposit advance payments
- d) Print payment receipts where applicable
- e) Support Multi currency
- f) Allow the definition of prices for various groups (individual, companies, exemptions etc)
- g) Track billing history for each patient/group
- h) Ability to integrate to existing Sage Accounting System
- i) Track system User activities, security and access audit (audit trails)

Three systems were identified and visited to explore their functionality against This requirements (for components 1 – 3). The results are detailed at the appendices section. This hospital will have an option to choose between the three.

Component 4: Human Resources Management System

The human resources management system should have the following functional and performance requirements

- a. Helping decision makers, human resource officers and heads of departments to manage human resources information to support efficient, equal and sustainable human resource deployment.
- b. Supports in producing, storing and updating human resource information and particulars
- c. Helps to identify, clarify and prioritize human resource issues
- d. Supports participatory decision-making and formulation of human resource deployment strategies.
- e. Enhances implementation of action plans pertaining to human resource recruitment, training, awarding and promotion
- f. Supports in accelerating the production of various reports
- g. Supports monitoring and evaluation of various achievements
- h. Easily integrated to the financial system in place
- i. Track employees leave and holidays
- j. Track system User activities, security and access audit (audit trails)

Component 5: Payroll System

The payroll system should have the following functional and performance requirements

- a. Manage and administer the entire Payroll and Taxation processes and automatically tracks the earnings, deductions and benefits for the purposes of reporting to Employees, Government Agencies, Accounts Department and Management.
- b. Manage Costing Distribution, Payroll History Tracking;

- c. Integrated to the General Ledger, Financial Systems and other Human Resources Management system
- d. Support User definable processing and payment periods; Weekly, Fortnightly, Monthly, Yearly or any other user specified period.
- e. The system will tax Terminal benefits using any newly introduced rules or chosen guidelines.
- f. The system supports Periodic or Annual salary increments.
- g. All Bonus /Arrears should be distributed to their respective months of payment for the Tax computation purposes.
- h. The system should convert overdrawn pay to the next month as a deduction. In addition, current, month-to-date, quarter-to-date and year-to-date amounts and days/hours are automatically maintained.
- i. Support Loans and Savings Processing
- j. Support payments via unlimited number of employee banks
- k. Support for unlimited third party organizations which offer loans to Hospital Employees (saving schemes, pension schemes etc)
- l. Support of payment in multi currency

Component 6: Internal Telephone System

The internal telephone system should have the following functional and performance requirements.

- a) Support for VOIP so that it can use the existing local area network
- b) Minimal interruptions and disconnections
- c) No calling charges for all internal calls
- d) Connect to external telephone system to enable incoming calls to be routed to respective location
- e) The system should be available (functioning) even in the event of longer power cuts. Should operate using a low power back up source.

Component 7: Local Area Network Extension

The Local area extension will cover the Surgery, Theatre, Maternity ward, Male ward, Female ward, Tuberculosis Ward, Paediatrics 1 and 2 Wards. The additional LAN will consist of

- a) 32 sockets
- b) 1 wireless client to connect to wireless network hospital
- c) 8 4U cabinets
- d) 7 8-port switches
- e) 1 16-port switch

4.4 ICT infrastructure (hardware and network)

At the moment, This has already developed its own ICT infrastructure on its own initiatives. The hospital is connected to 128 kbps wireless internet; the internet is distributed internally via their local area network.

The local area network currently consist of more than 70 LAN points wired using UTP cable, the network has four 24 ports switches and two 12 ports switches.

This hospital already owns 19 desktop computers and 12 laptops, the laptops are being used by various senior hospital administrators and most of the 19 desktops are in installed in the computer lab for computer trainings and internet access.

Further information and details on This ICT infrastructure is attached in the appendices section.

There will be a small additional network extension required and new computers, servers, receipt printers, document printers, barcode printers, barcode scanners, palm computers need to be purchased to add on the existing infrastructure as follows.

SN	Location	Hardware Type	Qty
1	OPD Registration	Desktop Computer	1
		Barcode Scanner	1
		Barcode Printer	1
2	IPD Registration	Desktop Computer	1
		Barcode Scanner	1
		Barcode Printer	1
3	OPD Cashier	Desktop Computer	1
		Receipt Printer	1
		Barcode Scanner	1
4	IPD Cashier	Desktop Computer	1
		Receipt Printer	1
		Barcode Scanner	1
5	OPD Doctors	Desktop Computer	2
		Label Printer	2

6	Clinicians' Rooms	Desktop Computer Label Printer	2 2
7	Doctors Rooms	Desktop Computer Label Printer	1 1
8	Wards	Desktop Computer Label Printer Extension of LAN to Wards	6 6 32
9	Laboratory	Desktop Computer	2
10	Surgery/Theatre	Desktop Computer	2
11	Dispensary	Desktop Computer Barcode Scanner	1 1
12	General Drug Store	Desktop Computer Barcode Scanner Barcode Printer Palm Computer Document Printer	1 1 1 1 1
13	General Store	Desktop Computer Document Printer	1 1
14	ANC	Desktop Computer Barcode Scanner Label Printer	1 1 1
15	Family Planning Treatment	Desktop Computer Label Printer	1 1
16	HIV Department Reception	Desktop Computer Barcode Scanner Barcode Printer	1 1 1

17	HIV Department	Desktop Computer Label Printer	3 3
18	Servers	HMIS Server HR and Payroll	1 1
19	Back up Devices	Tapes and Tape Drive	2

4.5 Power requirements & management

The proposed system will have to fit in within the existing power system available at This hospital. This hospital received most of its power from National Grid and is also equipped by stand by generator just in case of power cuts. It is greatly proposed to use the equipments with less power consumptions.

4.6 Software customization & release management

All software chosen will have to be customized to meet the requirements of This Hospital. A detailed user requirements, analysis and specification is being prepared by Leo Maluwa (Data Manager) under the supervision of external consultant. This document will provide the guideline for software customizations. This should have authority to manage the software updates and releases and should not be binded by the supplier.

4.7 Human resources and training plan

For the project to be successfully implemented and managed, a well coordinated and organised team of competent personnel are needed. Two committees are proposed:

i. Project Steering Committee

- Top committee
- Pass the Project Vision and Mission
- Passes New Policies and Processes
- It should consist of at least the following
 - Hospital Director (Chairman)
 - Project Coordinator
 - Other Top Decision Makers
 - Consultant (only when technical matters are discussed)

ii. Project Implementation Committee

- Actual Implementation team
- Manage day to day activities of project implementations
- Should consist of:
 - Project Coordinator (Chairman)
 - Project Technical Manager
 - Health Management Team
 - Consultant
 - Service Provider (Supplier)
 - ICT Department Team
 - Representatives from user groups.

The Project Manager/Coordinator and Technical Manager will be appointed from within This Hospital, while the data entry clerks are staff that already exist within each department and will be trained as appropriate. The team will be headed by a Project Manager who will report to the Project Committee. The HR organisation will be as follows:

a) Project Coordinator/Manager

Job description:

- Overall in charge of the project implementation and management
- Ensure that all aspects of HIMS, LAN and connectivity are in good working order
- Will manage and lead the team in organisational matters as well as motivation and commitment
- He will be appointed by the Project Committee
- Delegates administrative tasks to other project members
- Managing project finances
- Overseeing management of the project resources and maintaining proper records of the resources.
- Reporting to the donors on the progress of the project

b) Technical Manager (to be recruited)

Job description:

- Assist the project manager in formulating plans, budgets, ensuring that operations proceed according to plans
- Manage and assist other ICT staff (Recorders and general users)
- Ensure the smooth running of all technical system
- Management of the network and usage policies

- Act as the first point of escalation for technical problems
- Be the lead training resource person for all internal training programs

4.8 Trouble shooting and maintenance

This Hospital has a well established ICT department consisting of four ICT professionals as described below:

Name	Post and activities
Aisha Nangole	Secretary. ➤Running of computers
Frederik Nekelema	Network engineer ➤Maintenance of computers and network equipment
Bidour Komanya	Network engineer ➤Maintenance of computers and network equipment ➤Installation of servers and management.
Leo Maluwa	Data manager ➤ System development

This is good proof that This Hospital is well prepared to deal with all matters related to trouble shooting and maintenance.

4.9 Data security and back up policy

One of the major risks of introducing ICT systems is creating dependency on technology (non-ICT back-up system). The data being collected are of major importance. The project proposes to implement simple but yet very strong back up system using free back up software that come with most operating systems. Back up will take place in two copies of tapes on a regular pre scheduled cycles, where one tape has to be kept off site.

4.10 Change management plan

It is well understood that change is the most important factor in the success of this project. The project proposed to follow the fourteen steps change management guideline attached.

4.11 Integration of end user feedback

End users are the major players in the proposed system; end user motivation is the key to ensure that they become part of the system by using and owning it. The project will set up user groups within each department; these groups will have a full representation in the project implementation

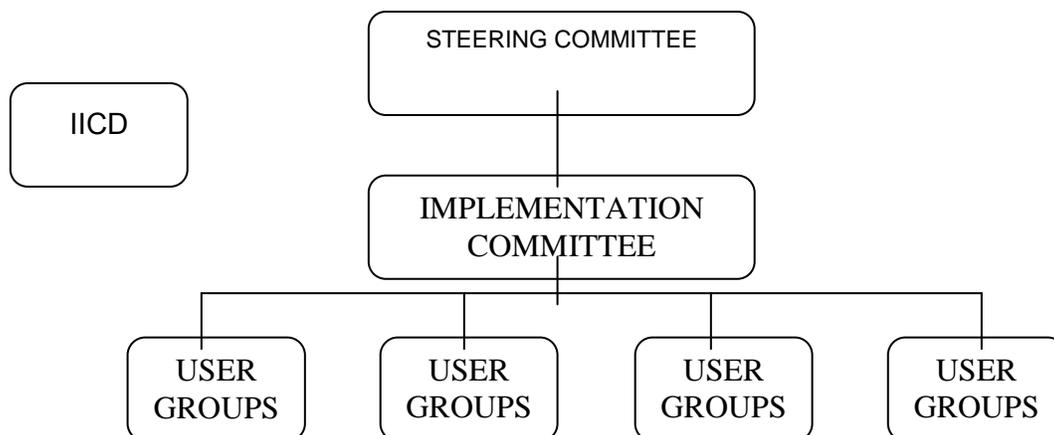
committee. Furthermore, a 14 steps change management guide will be adopted and followed closely to ensure that users are not left behind.

5. Time planning

The project will be implemented in phases for a period of 3 years from July 2009 to June 2012 as described in the table below.

Year 1 July – Dec 2009	Year 2 Jan – Dec 2010	Year 3 Jan - Dec 2011	Year 4 Jan - June 2012
<ul style="list-style-type: none"> • Patients Registrations for both OPD and IPD • Patients Billing including drugs price list • Human Resources and Payroll • Internal Telephone Communications System 	<ul style="list-style-type: none"> • Jan - June 2010 <ul style="list-style-type: none"> ○ Diagnosis and Treatment Module ○ Non Medical Stock Management System • July – Dec 2010 <ul style="list-style-type: none"> ○ Payroll System ○ Medical Store Inventory and Stock Management 	<ul style="list-style-type: none"> • Finalization of remaining modules for Hospital Management System (Laboratory, Surgery, Wards etc) • Public Health and Vertical Programs (Development and Integration of Vertical Programs link to the main hospital system) 	<ul style="list-style-type: none"> • Finalize Public Health and Vertical Programs Development and Integration

6. ORGANISATION AND MANAGEMENT



Project implementation will be directed by two committees; the Steering committee and the Implementation Committee.

The Steering Committee: This committee will be headed by the Hospital Director and will be responsible for making final decisions regarding the project. This committee will be made up of the Hospital Director (Chairman), Project Coordinator, Other Top Hospital Decision Makers and Technical Consultant (only when technical issues are discussed). It can be expanded as deemed necessary. This committee will meet at least once in a month.

Implementation Committee: This is the actual implementation team, this project will be managed by the Project Committee in all matters of day to day operations. The Project Committee will be made up of the Project Coordinator (Chairman), Project Technical Manager, Health Management team, Consultant, Service providers (suppliers), ICT Department team and representatives of the user groups. This committee will meet at least once every week.

Reporting, Monitoring and Control:

The reporting, monitoring and control mechanism will be done as follows:

The Steering Committee will receive reports from the project Coordinator. It will in-turn prepare annual reports for the respective organisations, government, the donors and other partners. The Project Coordinator will do all reporting within the organization. All reports made have to be submitted to the Steering Committee and to IICD. Monitoring will be done in line with IICD's M&E system, which is based on feedback and learning.

The financial control will follow CountryName financial regulation, by the Project Coordinator. The project will have internal audit as well as external audit by public certified accountant.

The processes and lessons learnt from this project will be the substance of information that will be shared with other initiatives in health in CountryName.

The role of IICD:

IICD has a triple role. It will act as an advisor/coach to the project. It will provide technical advice, training and Monitoring and Evaluation for a period of 3 years.

7. FINANCIAL PLAN

7.1 Basic Assumptions on Benefits

It is assumed that; the successful implementation of the system will increase the revenue of the hospital by 25% on the first quarter of operation; the revenue will further increase by 5% on the following quarters due to the following facts:

- Introduction of the computerized patient billing will eliminate the income lost due to inaccurate debtors tracking and thus increasing the hospital income
- The computerized billing will further ensure that bills are generated in time and accurately and no patient receives the hospital services without paying
- Accurate drugs stock and non drugs stock monitoring will further provide the hospital more additional income. Stock monitoring system will ensure right stock is ordered, replenishment level, expiry and stock balances are accurately monitored.
- Reduction on paper work will further provide saving for the hospital
- The system is expected to increase the ability of the hospital to accurately and efficiently provide health care services; this means more patient will be served and therefore further additional income to the hospital.

The income forecast based on the benefits obtained by the use of the system are as detailed below (all figures in USD).

Period	2010				2011				2012	2013	2014
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1-Q4	Q1-Q4	Q1-Q4
Income from OPD and IPD Sections	48,802.82	51,242.96	53,805.11	56,495.36	59,320.13	62,286.14	65,400.44	68,670.46	268,461.03	281,884.08	295,978.28

7.1 Investments Costs

In conceptualising the project concepts, activities and budget, some basic assumptions have been made:

- i. The primarily currency used is US dollars. However, funding is made on based on Euro and some expenses will be in CountryName and Kwacha (MK). It is therefore assumed that the currency fluctuations will not adversely affect an end amount. The exchange rate at the time of proposal writings were, US\$1 = MK 142 and Euro1=US\$1.30
- ii. It is assumed that all equipment and services procured will carry a warranty of at least 12 months

Here are the details of investments costs for the first phase, other phases are detailed in the cash flow section

A: HARDWARE

SN	Description	Qty	Unit Cost (\$)	Total Cost (\$)
1	Applications Servers	2	2,500.00	5,000.00
2	Workstations (Desktop Computers)	20	75.00	1,500.00
3	UPS	20	200.00	4,000.00
4	Label Printers	4	600.00	2,400.00
5	Receipt Printers	2	600.00	1,200.00
6	Document Printers	2	600.00	1,200.00
7	Palm Computer/PDA (Mobile Barcode Scanner)	1	3,000.00	3,000.00
8	Hand Held Scanner	6	333.00	1,998.00
9	Local Area Network Extension	1	4,000.00	4,000.00
10	Backup System	2	1,000.00	2,000.00
SUB TOTAL (\$):				26,298.00

B: SOFTWARE

SN	Description	Qty	Unit Cost (\$)	Total Cost (\$)
1	Patient Registration System	1	3,000.00	3,000.00
2	Patient Billing System	1	3,000.00	3,000.00
3	Human Resources Management Software	1	3,000.00	3,000.00
4	Payroll Management Software	1	3,000.00	3,000.00
SUB TOTAL (\$):				12,000.00

7.3 Operation Costs

Here are the assumptions that have been made for operational costs

- i. It assumed that document printers and thermal receipt printers will come with initial ribbons and cartridges to be used during the testing and trainings
- ii. Apart from Data manager salary, trainings and the costs for conducting change management workshop and stationeries no additional costs are planned for.
- iii. Other hospital operational costs not related to this system have not been considered but will definitely affect the net income.

Here are the details of operational costs for the first phase; other phases are detailed in the cash flow section:

OPERATIONAL COSTS

SN	Description	Qty	Unit	Unit Cost (\$)	Total Cost (\$)
1	Data Manager Salary	12	Monthly	833.33	10,000.00
2	Data Manager Training	1	L/Sum	4,000.00	4,000.00
	Air Tickets for consultants from outside	4	Ticket	1,000.00	4,000.00
3	CountryName				
4	Training of hospital staff	1	L/Sum	4,000.00	4,000.00
5	One year supply of ribbon and paper rolls	12	Monthly	250.00	3,000.00
SUB TOTAL (\$):					25,000.00

7.4 Cash Flow

Please find the cash flow attached in a separate excel sheet.

7.5 Financing plan

The total estimates are **Euro 20,229.23** for Hardware investments, **Euro 9,230.77** for Software and **Euro 19,230.77** for operational costs, these add up to grand total project cost of **Euro 48,690.77** required for the project implementations in its first year.

Financial estimates Details attached in an excel file.

This Hospital has set out a budget of **Euro 17,692.31** to partly cover the cost for implementation in the first year, the remaining funding of **Euro 30,998.46** required for the first year of the project is sought to come from the Donor.

7.6 Sustainability plan

This project is envisioned to be supported in the initial stages. Most of the initial capital and set-up costs will be sought from a supporting organisation. The system is expected to generate additional income for the hospital due to the following facts

- Introduction of the computerized patient billing will eliminate the income lost due to inaccurate debtors tracking and thus increasing the hospital income
- The computerized billing will further ensure that bills are generated in time and accurately and no patient receives the hospital services without paying
- Accurate drugs stock and non drugs stock monitoring will further provide the hospital more additional income. Stock monitoring system will ensure right stock is ordered, replenishment level, expiry and stock balances are accurately monitored.
- Reduction on paper work will further provide saving for the hospital
- The system is expected to increase the ability of the hospital to accurately and efficiently provide health care services; this means more patient will be served and therefore further additional income to the hospital.

It is expected that the benefits listed above obtained by the use of ICT will enable This Hospital to establish additional income and build its capacity for longer term sustainability of the system.

- The system will generate extra income for This, and This should be able to buy new computers and maintain the existing ones.
- The system will significantly reduce the workload from employees, employees now can use the extra time gained to attend various training and hence improving the service delivery of the hospital.
- This will be able to pay additional bonuses to employees promoting the use of the system.

8. Appendices/Attachments

1. Change management guide
2. Time Planning
3. Financial Estimates
4. This Organisation chart
5. Analysis of available software on the market

ANNEX 2: Health care in Tanzania and why it is so important to use ICT

This section contains general information about Tanzania that will help the reader place the information described in this document in context. This information comes from a report written by Famahu (2002) entitled *Healthcare Training and Internet Connectivity in Sub-Saharan Africa*.

Health assessment

In Tanzania, the epidemiologic transition has probably already begun in an overlapping pattern, meaning that for parts of society the transition in chronic and degenerative diseases has taken place, whereas for others (or even the majority of the population) infectious diseases still play a major role. Rich or middle class people may suffer from hypertension, diabetes and cancer while people in rural areas still die from malaria and meningitis. On top of this, the 'win' in life expectancy achieved over the last few decades has been wiped out by HIV/AIDS.

Health and Training

Infrastructures

Major university, government and private hospitals

There are eight consultancy or specialized hospitals in Tanzania. Of these, four are run by the government, two by parastatals, and two by the not-for-profit sector. In addition, there are 17 regional hospitals, all of which are run by the government. From 1977 to 1991, private hospitals were banned in Tanzania and the government assumed responsibility for delivering most of the health services. It is estimated that there are 20 hospitals, 16 health centres, 663 dispensaries, 22 specialized clinics, 6 nursing homes, 184 laboratories, and 16 X-ray units in the private sector in Tanzania.

Medical Schools (including the number medical undergraduates per year)

There are four Medical Schools in Tanzania. They are:

- Kilimanjaro Christian Medical College which is part of Tumaini University in Moshi which is under ELCT. It started training doctors in 1997;
- The Faculty of Medicine, Hubert Kairuki Memorial University, Dar es Salaam;
- The Faculty of Medicine, Muhimbili University of Health Sciences, University of Dar es Salaam. In 1997/8, the university increased its annual intake of medical students from 50 to 103.
- The Faculty of Medicine, Vignan's International Medical and Technological University.

Demography

Population Size: the population of Tanzania was estimated to be 33 million in 2002.

Ethnic Groups: there are more than 120 ethnic groups in Tanzania. The largest are the Sukuma who comprise about 13% of the population. Other significant groups are the Nyamwezi and Chagga.

Languages: the official language is Swahili. English is also spoken widely. It is estimated that there are more than 120 spoken languages in Tanzania.

Urban-rural distinction: it is estimated that 32% of the population live in urban areas and 68% in rural areas.

Age Structure: 46% of the population is estimated to be less than 15 years of age.

Major Cities and Towns: Dar es Salaam (capital), Morogoro, Dodoma, Iringa, Mbeya, Arusha, Moshi, Tanga, Mwanza.

Economy

GDP per capita (USD): USD 257 (in 2000)

GDP per capita annual growth (1990-1999): -0.10%

HDI Rank (2001, based on 1999 figures): 140

% population below national poverty line: 41.6%

Public Health Institutes

- Muhimbili University College of Health Sciences' Institute of Public Health, in collaboration with the Department of Tropical Hygiene and Public Health;
- The University of Heidelberg, Germany and the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) in Dar es Salaam, Tanzania offers a Masters Programme in Public Health. They also offer short courses, such as one in consultancy skills relating to international public health which began in November/December 2002.

Research centres undertaking research that is directly relevant to people's health

- The ENRECA (Enhancement of Research Capacity) Health Research Network is a Danish-Tanzanian initiative aimed at increasing the capacity of Tanzania's research institutions. To date, its focus has been on malaria. A three-phase program operated from 1992-2001. Projects include active research and training. In addition to Tanzania, ENRECA supports health-related projects in eleven (11) other countries Uganda, Kenya, Sudan, Egypt, Mozambique, Madagascar, Guinea Bissau, Ghana, Nepal and India. It operates in Tanzania through the National Institute for Medical Research.
- The Amani Research Centre is located in Tanga and was founded in 1949 as the East Africa Malaria Unit. However, in 1951, EAMU relocated and Amani expanded its activities to include other diseases. In 1977, when the East African Community collapsed, the centre adopted its present name. Amani operates five scientific programs with thirty-three (33) staff. The African Malaria Vaccine Testing Network (AMVTN) was established in Arusha in 1995. It has members from developed countries and various African countries. It is chaired by Wen Kilama who is based in Dar es Salaam along with the AMVTN secretariat. AMVTN produces a newsletter and has generated a database of organizations that are able to be involved in testing a malaria vaccine.
- The Commonwealth Regional Health Secretariat for East, Central and Southern Africa is located in Arusha. They are involved in reproductive health research and in building research capacity.

Internet connectivity amongst doctors in Tanzania

Undergoing rapid modernization, the poor telecommunications infrastructure in Tanzania is no longer the major barrier it has been in the past to the spread of email and full internet services. The capital city, Dar es Salaam, has now seen dramatic improvements to the local infrastructure, with many digital exchanges being installed, the availability of two cellular telephone networks, and half a dozen Internet Service Providers (ISPs) now available. Nevertheless, network access in areas outside Dar es Salaam is still very limited. Fibre cable is being laid in Moshi and Arusha and the Dodoma-Dar-Zanzibar-Tanga-Moshe-Arusha microwave links are being digitized, as are links to Morogoro and Mwanza. Currently, telecommunication links in northern Tanzania (Arusha) are more reliable to other parts of the country like Dar es Salaam and other big towns. A good number of cyber cafés are found in towns, though some are still too expensive for most people to afford.

A number of projects aim to invest in communication equipment in health facilities for easy internet accessibility. A good example of this is the MEMS project which installs VSAT to FBO hospitals dispersed all over the country, most of them in rural areas. It is no longer difficult for medical staff to get access to the internet, regardless of their physical locations whether this happens to be in the cities and towns or in the rural areas.

The main challenges for Tanzanian policy-makers and medical professionals

With regard to the operation of the Tanzanian healthcare system, in our opinion the main challenges are:

- The demand for healthcare exceeds the capacity of the healthcare system. The demand is still growing while the productivity of the delivery system is balanced or even decreasing;
- There is a shortage of qualified personnel;
- There is a shortage of knowledge and the distribution of knowledge;
- There is a shortage of equipment and facilities;
- The financial and business models for healthcare delivery are still under development.

At this point, the impact of corruption is also worth mentioning. Corruption is a serious problem in Tanzania. On a subjective corruption scale, the score for Tanzania is 2 (the maximum score is 10 (no corruption) and the lowest 0 (highly corrupt). Corruption has an impact on all sectors of the economy, but has a profound impact on the healthcare system. All projects aimed at improving the healthcare system need to include a strategy to deal with this corruption.

Other factors that should be taken into account are knowledge transfer and education. Both are of vital importance for the development of the healthcare system. In a recent publication, Thomas Jaenisch notes that knowledge transfer does not seem to take place routinely, not even in school, where imitative learning is practiced. The common process in society seems to be to gain knowledge and to keep it as a private secret. If this is correct, it will have enormous consequences for the change processes we are facing and the design of training programs.

The diagram below depicts the most important health-related problems in Tanzania, according to Thomas Jaenisch.

Ways of defining public health problems				
Criteria for choosing problems	Top direct causes of mortality, adults, 1992-1998	Top direct causes of mortality in the mortality stratum	Social and environmental conditions affecting health and equity	Political and economical hardships resulting in poverty and disease
Most important problems	<ol style="list-style-type: none"> 1. HIV/AIDS 2. Injuries (M), Maternal (F) 3. Acute febrile illness (incl. Malaria) 4. Tuberculosis 5. Diarrheal disease 	<ol style="list-style-type: none"> 1. HIV/AIDS 2. Respiratory infections 3. Injuries 4. Malaria 5. Diarrheal Diseases 	<ol style="list-style-type: none"> 1. Empowerment of women 2. Deforestation, Soil erosion 3. Imitative learning in education / knowledge is kept secret 	<ol style="list-style-type: none"> 1. Foreign debt 2. Refugees in the Great lakes region 3. Corruption
Sources of information	CDC ²⁸	UNICEF SOWC 2001	Previous analysis, own experience	Previous analysis, own experience

Fig. 1: The most important issues affecting the Tanzanian Healthcare System, according to Thomas Jaenisch.

The importance of information systems for the Tanzanian healthcare system

Healthcare is a very information-intensive line of business. Apart from the banking industry, there is hardly any other line of business where so much data, information and knowledge is used during the production of services. That is why the application of information technology (IT) has such a profound impact in healthcare. Elsewhere, the application of IT has improved the quality of healthcare delivery dramatically: it has reduced costs; made healthcare delivery processes more effective; and, made an enormous contribution to the distribution of healthcare knowledge, both to professionals and to patients, i.e. the consumers of healthcare services.

Based on experiences elsewhere, one might expect that for the Faith Based Medical Facilities too the impact of the implementation of an HMIS could be very profound:

- reducing paper work and costs;
- improving financial management;
- improving the quality of healthcare delivery; and
- increasing the productivity of medical professionals.

On top of which, it will give an enormous impulse to the transfer and distribution of knowledge.

The real value that an HMIS will add to a specific hospital is, of course, dependent on the specific situation of the hospital in question, particularly the quality and maturity of the organization; the quality and maturity of the various medical departments within the hospital; and the quality of the local ICT support organization. The quality and maturity of the organization means, amongst other things, the ability:

- to manage such a change process;
- to be result-oriented; and,
- to have a clear vision on how to improve the process of care delivery.

This applies both to the general management of the medical facility as well as the medical management.

To prioritize the various objectives of implementing an HMIS, it might be useful to apply the pyramid principle. This is a technique that is used to analyse the different problems that have to be solved and to extract from these problems and their context the main question that has to be answered. An example is given in the following diagram.

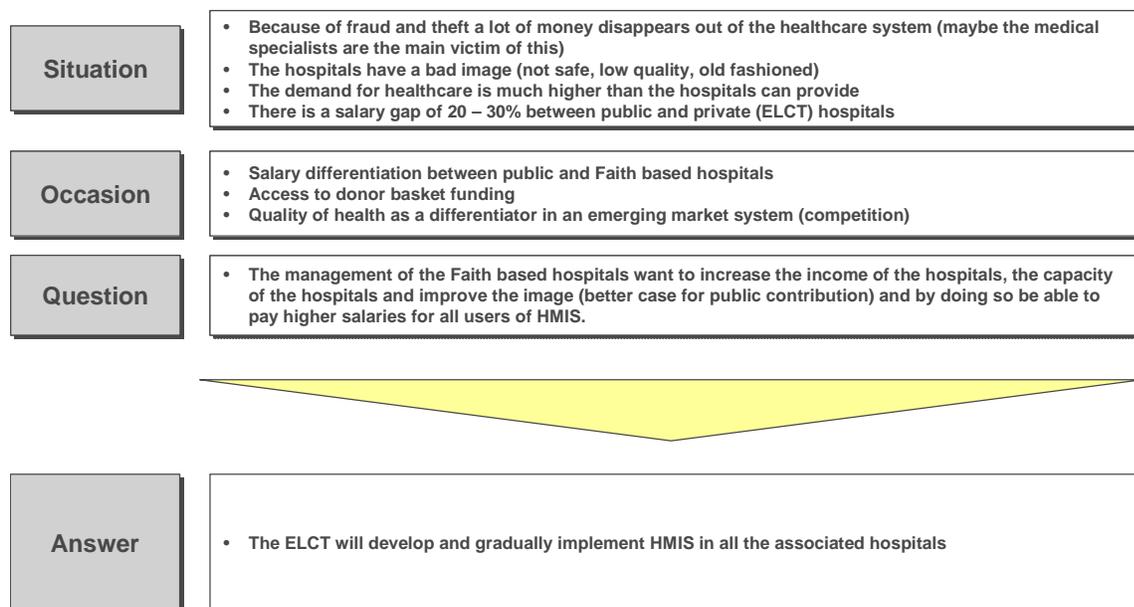


Fig. 2: Example of the application of the pyramid principle for the implementation of HMIS for the ELCT.

It is obvious that purchasing and implementing an ICT infrastructure and dedicated software requires a serious investment and exploitation costs. We therefore advise making a business case as part of the implementation plan when defining the project ('Why do we want to introduce ICT into our Healthcare facility?') and calculating the necessary investment, the cost of exploiting and maintaining an HMIS and, on the other side of the coin, making an overview of realistic quantitative and qualitative benefits. The hospital should only embark upon the project when the business case it draws up is a positive one.

As stated earlier, introducing ICT into the healthcare system can bring an enormous added value to the system. To capitalize on this, it is necessary to change the working processes, procedures and responsibilities. That is why we emphasize the fact that introducing ICT is primarily a change process.

It is also important to mention here that the efficiency and effectiveness of the system very much depends on having a basic minimum infrastructure in place from the outset. This minimum package should include, among other items:

- ✓ A set of computers;
- ✓ A server for each hospital;
- ✓ A set of reliable communication facilities; and,
- ✓ An adequate human resource base.

Efforts are underway to improve the hardware and human resource base available in accordance with the requirements of this project. These prerequisites are meant to make the facility feel involved and more responsible for implementing the HMIS. The senior administrative staff and the junior staff members should understand that they need the system and accept it. They should see themselves as the owners of the system and therefore accountable for everything related to its operation within the hospital.

Consequently, the basic idea here is to develop a customized HMIS for use in our health facilities. The HMIS should not only be able to collect health utilization information and data for use by the facility management, but also collect information to meet the needs of the national HMIS-MTUHA. The system should be user-friendly and the information collected should be reliable. In order to be able to collect reliable information, the users have to be both committed and motivated, as well as having a change in attitude.

When the system is fully operational, it is expected that the facility management will be able to utilise the information generated in an appropriate way to improve the performance of the health facility, thereby improving healthcare delivery and the overall quality of the healthcare services it provides.

The above will only be achieved through a careful and well planned operational strategy. For example, before the HMIS software is available to all health facilities, it will first be customized and piloted in a few facilities, which is currently the case. In addition to this, a careful and well planned organizational and change management operational strategy will be carried out. This entails the appointment of a full-time organizational and change management team. The latter shall work hand-in-hand with another team that is responsible for providing technical support for the HMIS software as well as internet connectivity, including trouble-shooting.

ANNEX 3: Preparation

During the preparatory stage, start with an assessment of the current state of the HMIS: we know basically at this stage that it is being carried out manually. A number of questions can be directed to staff members like:

1. What is an HMIS? – They could be well informed about HMIS, but you might also come across participants who do not know!
2. Is the time right to have an HMIS in the facility? Quality and cost-conscious? (Cost in terms of time, money and manpower).
3. How long do they take to prepare the national HMIS of the Ministry of Health (MTUHA) ?
4. Are they satisfied with the existing system? These can be a few of the interrogative questions that can serve as a starting point to make a computerized HMIS essential.
5. Give them room for brainstorming and deep discussions.

A benefit model can be developed.

1. Presentation of the computerized HMIS.
2. Show how the system operates. What it can deliver.
3. What are the benefits?
 - Individual benefits.
 - Organizational benefits.
 - Patients' and other stakeholders' benefits.

Then give them room for discussion.

In this way, we can obtain definitive results. This can be done with hospital management at first, and later with the general staff as well.

The introduction of a Health Facility Management Information System (HMIS) will have a profound impact on the organization and will lead to far-reaching organizational changes and a change in the existing culture. That is why it is very important to get a clear understanding of the prevailing values, conventions and beliefs; that is, insights into the factors that determine peoples' behaviour in this context. Next, help those involved to define the future situation; this is not only a vision, but also more of a description of this future situation. This future is partly influenced by changes in the environment and partly by changes within the organization. A business case indicates the effects of the changes on the revenues generated and the expenditure incurred. A powerful tool to make work easier and more efficient is to analyze the current flow - for example, the flow of the patients through the hospital - and to search for ways to improve this: process redesign. In this annex we discuss:

- 1. Stakeholder analysis**
- 2. Development of a vision**
- 3. Development of a business case**
- 4. Description of the future situation**
- 5. Process analysis and redesign**

Identifying the stakeholders and their expectations of an HMIS

- ✓ Identify stakeholders and their roles in the hospital.
- ✓ Identify the key players in the hospital e.g. department heads, administrators, etc.
- ✓ Become engaged with those stakeholders in order to give them room to identify who is to do what. This can make sense because they will feel that they have participated and are involved in the process.
- ✓ Communicate what the project will deliver (the objectives).

In this chapter we will describe who the stakeholders of the healthcare delivery process are, what their position is, and what is in it for them if ICT is introduced. This information is based on several workshops that have been carried out by the ELCT project team and is a compilation of the workshop results. It is very useful when designing a project plan for a new client. However, it is important to notice that such an analysis and such workshops must be made during each new project because, apart from all the information concerning the content, these analyses and workshops are also a crucial step in developing a relationship with the stakeholders and making them feel 'involved' and important for the success of the project. The stakeholder analysis will also be the basis for the sponsor organization, i.e. to determine the people who will be leading the change.

As the main stakeholders for an HMIS implementation project are identified:

- Government (Ministry of Health, RMOs, DMOs and CMOs)
- Directors (church leadership)
- Doctors
- Pharmacists
- Insurance companies
- Patients
- Hospital Administrators
- Laboratory technicians
- Record technicians
- Nurses
- ICT Companies
- Donors

During the workshops these stakeholders mentioned benefits, drivers and concerns:

GOVERNMENT (MoH, CMO, DMO, RMO)

Disadvantages with the current, manual system

- Very time-consuming, with difficulties in compiling and analyzing data given from health facilities all over the country.
- Reference to data piled up in files is time-consuming and boring.
- Data kept in paper format is vulnerable, so there is an increased risk of losing information.
- More time and resources spent in producing national statistics and data.
- Because of the above reasons, sometimes old and outdated statistics are used while in fact so much change has taken place; so the present policy information is not reliable.

Advantages when using an HMIS

- Easy to access, make, get and analyze data.
- Easy to produce national statistics.
- If data is stored well there is no danger of wear and tear.
- If the correct data are entered, the correct analysis of a situation is assured.
- Easy to search data, even from a very long time ago.
- If the system is well-organized less resources are needed in terms of human resources, time and cost.
- Requires less space for keeping files and other sources of information

CHURCH LEADERSHIP (Bishops, Diocesan General Secretaries and Health Secretaries)

Disadvantages of the current manual system

- Too much time needed if one wants to compile and analyze data from the health facilities in the dioceses.
- The accuracy, security and confidentiality of data is compromised.

- A large number of people have to be paid to gather statistical data.
- Monitoring and planning difficulties due to inappropriate data and information from the health facilities.
- Unreliable data leads to missing out on support from the government and other donors.

Advantages when using HMIS

- Cost-effective in compiling and analyzing data from health facilities under the dioceses.
- The accuracy, security and confidentiality of data is guaranteed.
- It is possible to access data from the health facilities remotely.

DOCTORS

Disadvantages of current system

- Data redundancy - tedious because the same information has to be filled in repeatedly.
- Difficulty in retrieving the diagnosis of a difficult case, if you come across a similar one.
- It is hard to capture hand-written information written by someone else.
- It is hard to access stored information.
- It is hard to access the pharmacy to determine which medicines are in stock
- It is hard to explain to doctors what the business aspects are of the service they provide.

Advantages when using an HMIS

- It is easy to make a medical audit.
- It is easy to retrieve old information.
- It is easy to perform a diagnose and prescribe drugs to a patient.
- Doctors can exchange views through computer resources.
- It is easy to introduce telemedicine.

INSURANCE COMPANIES

Disadvantages in using a manual system

- Hard to access information from the facilities.
- Not easy to identify the real beneficiary.
- Hospital staff can enter incorrect information on the invoices.
- Not easy to identify the companies that are no longer contracted by the hospital.
- Invoicing and reporting takes up a lot of time so payments to the hospital in question are delayed.
- Not easy for hospitals to identify companies with a bad repayment record.

Advantages when using an HMIS

- Doctors can obtain records of their clients quickly and accurately.
- Easy to identify the real beneficiaries.
- Possibility of transparency of information.
- The company is readily aware of their contractual status.
- Information can be shared easily between the hospital and the insurance company.
- Confidentiality of the patient's records is guaranteed.
- Easy for the company to know and track the health status of their workers.

PATIENTS

Disadvantages of the current manual system

- Patient information and records are not centralized.
- Hard for a patient's diagnosis case to be referred to in order to assist other patients.
- Hard to capture hand-written information.
- Hard to access stored information.
- Hard to access the pharmacy to determine which medicine is in stock.
- Difficult to make appointments with specialists.

Advantages when using an HMIS

- Patient information is safe and confidential.

- Accurate records about patients.
- The patient's records can be sent to any centre quickly.
- Easy to make an appointment with doctors.
- Easy to get access to a patient's treatment history.
- The service delivery is more systematic and faster.

PHARMACISTS

Disadvantages of using a manual system

- It is hard to make an inventory, to monitor and evaluate, and to stock-take.
- Not easy to get a sales report per item.
- A lot of time is spent on calculations (bills).
- Difficult to track who did what in stock movement.
- Hospitals often fail to realize that their drug supply is running low because it is not easy to count each item daily.

Advantages when using an HMIS

- Good for stock control and maintaining fixed levels of ordered drugs.
- Fast, accurate and reliable reports.
- Easy to get information about the expiry dates of drugs.

LAB TECHNICIANS

Disadvantages of using a manual system

- Lack of adequate reports.
- Reporting takes time and is not accurate.
- Too much paper work.
- Unnecessary calculations.

Advantages when using an HMIS

- Fast, accurate and reliable data.
- Less time needed to record information.
- Easy to access old reports.
- Computers can entertain the lab technicians while they are working.

HOSPITAL ADMINISTRATORS

Disadvantages of using the current manual system

- Inaccurate information – finance, statistic data and reports.
- Dependent on people to get certain information – inaccurate because one thing can be done with different people, so different information is given.
- Difficulties in human resource management.
- Difficulty to trace who did what. Difficult to trace things like cheating.
- More cost in human resource...employing more people, more training, insurances, etc.
- Difficulties in inventory and procurement – manual follow-ups of supplies (vendors).
- Slowness in decision-making because of improper information.
- Lack of cost effective decision-making.

Advantages when using HMIS

- Possibility of accurate information within a short time from all departments and all points of service delivery.
- Since it takes short time to get required information, the decision-making mechanism for management is shortened.
- Generating proper reports which do not need much in the way of human resources.
- Less dependence and maintenance costs on human resources.
- Clarity in financial information.
- Proper information provides the opportunity for more support from partners, donors and friends for expansion and improvement.

- Advertises the facility because people are convinced that the quality of service provided is good as long as computers are in use.
- Assurance of getting well-qualified staff because they feel respected and more comfortable to work in a health institution with computers.

ACCOUNTANTS/TREASURERS

Advantages when using HMIS

- Reliable financial information.
- Fast and timely reporting system.
- Better financial control of the cash flow.
- Paper work reduction.

NURSES

Disadvantages with the current manual system

- It is too much to read through the doctor's paper work.
- Unnecessary duties like drugs collection from the IPD.
- Difficulty for them to keep track of doctors' schedules.

Advantages when using HMIS

- Easy to keep track of doctors' schedules and for attending patients.
- Easy to keep track of patient's appointments with doctors.
- No need to move physically to and from the laboratory to collect lab tests for patients.

ICT COMPANIES

Disadvantages with the current manual system

- Difficult to educate hospital workers on the importance of ICT.
- Disturbances in solving minor problems and trouble-shooting which could be done by a trained staff in the facility.

Advantages when using HMIS

- Good reasons to train hospital workers in computer applications.
- Good market for selling their services like internet connection, networking and software.
- Hospital will hire a technician to support computer infrastructure, hence less of a problem for ICT companies.
- Recording and achieving information is made simple to them.
- Can use the services sold to health facilities to advertise themselves.

DONORS

Disadvantages of current manual system

- Cannot easily track data for any use.
- Sometimes data is missing for references and for supporting the idea or concept which leads (potentially) to a misinterpretation of reality.
- Inefficiency in information compromises facility-donors partnership.

Advantages when using HMIS

- Easy to make data and to analyze it.
- Easy to access data from the facilities database instead of waiting for pre-cooked data.
- If data is kept safe and well there is no wear and tear.
- Less chance of losing information/files if back-up of data is properly done.
- Simplify billing system.

Some of the agents like DMOs and RMOs have external influences and they can facilitate the process if they know what HMIS can provide and how it can make their jobs run more smoothly. In the following diagrams the results of the stakeholder analysis so far have been summarized.

Key Stakeholder Groups	Key Individuals	Main Benefits	Risks/ concerns	Importance to success of project	Our influence strategy	Action Steps
Government		More reliable Management and Policy information				
CHURCH LEADERSHIP		More reliable Management and Policy information		+++		
INSURANCE COMPANIES		reducing costs of the declaration process and more reliable information		+		
PATIENTS		Improvement of the quality of Healthcare delivery				
DOCTORS		More knowledge, more reliable information, improvement of the quality of healthcare delivery,		++++		
ACCOUNTANTS / TREASURERS		higher income Transparency, more reliable insight in income, cash flows and expenses	Lack of money to invest			

Key Stakeholder Groups	Key Individuals	Main Benefits	Risks/ concerns	Importance to success of project	Our influence strategy	Action Steps
DONORS		More reliable management and policy information, improving quality of healthcare delivery				
NURSES		More knowledge, improvement of the quality of healthcare delivery				
PHARMACISTS		Better stock management, improvement of the quality of healthcare delivery		+		
LAB TECHNICIANS		Professionalization of their work		++		
HOSPITAL ADMINISTRATORS		Reducing paper work, more adequate information, transparency, more reliable insight in income, cash flows and expenses		++		
ICT COMPANIES		Enormous opportunity to develop business		++		

From these diagrams it is clear that the analyses have not yet been completed and should be supplemented by additional information and analyses. The risks and concerns in particular (why might these stakeholders be against this change?) are important because, on the basis of these, the project team can design the change strategy and the way they will communicate and

influence the stakeholders. To finish the stakeholder analysis some useful questions might also be:

- **Needs** - What needs do these stakeholder groups have at this moment?
- **Mobilisation plan** - What interventions are useful for each group, seen over time?
- Who should be involved for each intervention?

Bishops, Diocesan health secretaries and others are not directly involved in the day-to-day activities of hospitals but are part of the decision-makers' group that decides whether the hospitals should use the system or not. Hence, a clear understanding for them of HIMS is compulsory if the implementation is to be in any way effective and participatory. Despite the fact that there is a well-defined hierarchy in the church's structure and its institutions, sometimes the issue of knowing who is the most influential person in the change and implementation processes is more effective. Consequently, it is not necessary to rely on the established hierarchical structure.

At the same time, doctors in charge have all the powers on hand when it comes to what has to happen at the facility level. Most of the system users are junior staff of the facility. Their role, participation and influence should be valued as just as important as that of management. Teaming up with them and having representatives from this group is crucial and will show them that they are honoured and that their contribution is respected.

Based on our present knowledge, in our opinion the doctors are the most influential and most important stakeholders that will determine the success of the project. So a lot of attention has to be paid to their opinions, beliefs and concerns.

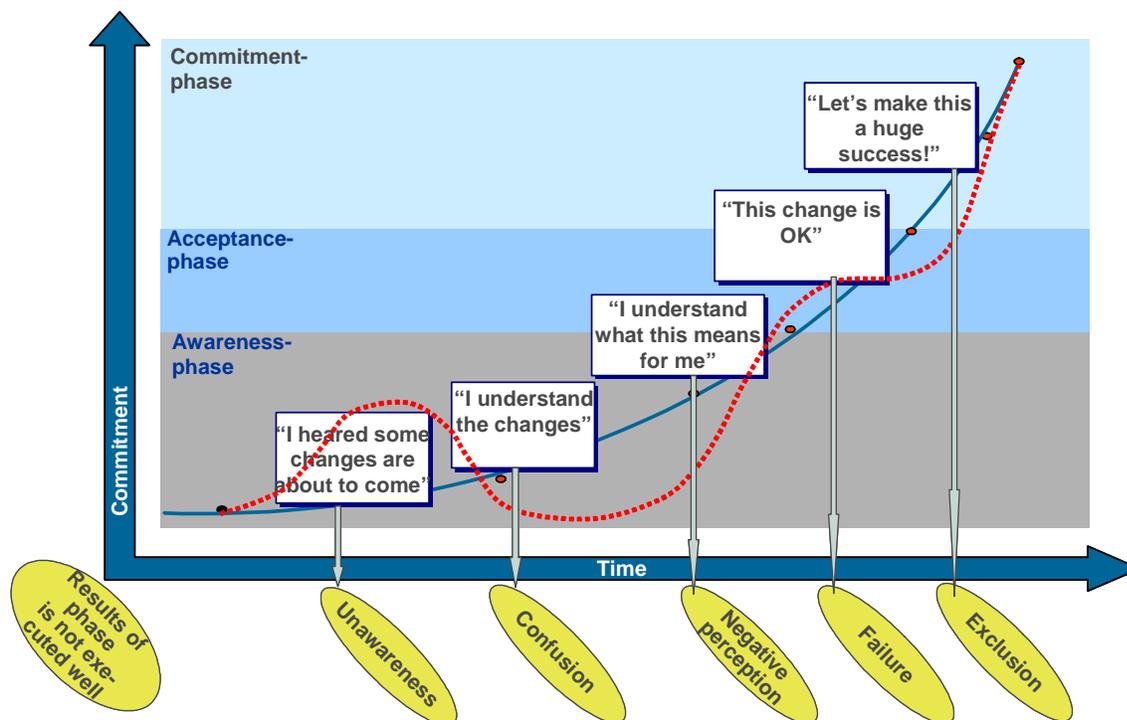
During the change process we distinguish the following roles:

1. **Sponsor:** An individual who has the authority to make the key decisions necessary for the success of the project, e.g. a hospital director.
2. **Change leader.** An individual who is in a position to make or influence decisions, which will impact the success of the project in a particular functional area, i.e. a doctor.
3. **Target.** An individual directly impacted by the change and not playing an active role in the change.
4. **Advocate:** An individual who supports the change, but who may or may not be directly impacted by the change. They have the ability to influence other stakeholders, but do not have the functional authority to make things happen.

Based on the stakeholder analysis we suggest that in each hospital where HIMS will be implemented a doctor will be selected to be the 'change leader'.

Depending on the scope of the HIMS implementation, it will take several months to execute the project. If the scope of the project is so large that it will take 6 months, or even more, it will be necessary to repeat the stakeholder analysis. Over time, the position of the stakeholders might change and also their involvement and commitment to the project results. *Therefore it is so important to start off in a participatory way and to allow the health staff to define the priority areas and objectives of HMIS. It is important to have a true dialogue between the management and the staff. It is important to take time for the participatory process in order to allow people to simulate mentally how the work will be when using the HMIS. Also training helps a lot to get staff used to ICT.*

If HMIS is initiated without participation, there will be a lot of confusion and negative perception. In the best case scenario, it ends up with commitment (see diagram below). In the worst case scenario, it fails entirely. Also, if the project execution is below expectations, commitment goes down strongly.



Corruption

Although we realize that it is hard to mention the C-word, inappropriate cash flows will affect the commitment of certain stakeholders to this project. On the other hand, the application of computer systems and redesigning certain administrative and financial processes will also make it more difficult to hide inappropriate cash flows. Therefore, in designing the change strategy, and also the design of business processes, one has to deal with the C-word and be aware that at all levels of the organization leakage of money might take place.

A guiding principle for a strategy might be the following. While traditional approaches to anti-corruption such as repression and prevention certainly have their merits it is doubtful whether they should be the guiding principles for future reform measures. Rather, they have to be complemented by novel inspirations. In particular, new reforms should promote betrayal among corrupt parties, destabilize corrupt arrangements, disallow contracts from being legally enforced, and impair the operation of corrupt intermediaries. In this context, an asymmetric design of sanctions, coupled with exemption from punishment, seems a promising avenue for future (legal) reform.

Combating corruption is like judo. Instead of bluntly resisting the criminal forces, one must redirect the enemy's energy to his own decay. Instead of proclaiming a policy of zero tolerance one must recognize that the imperfections of human behavior will endure. Instead of demanding a world of absolute integrity, fighting corruption first and foremost is the art of exploiting these imperfections for our battle.

If we can design a strategy in which there are, at least during the first phase of the project, clear (financial) benefits for all the stakeholders involved, the project might be very successful.

Selection of a pilot site

One of the critical success factors of the HIMS implementation project is retaining the confidence of the clients. Confidence that the ELCT project team are able to live up to the expectations that they will deliver according to the agreement, without disturbing the present operation of the Healthcare facility. To deal with these expectations, reduce risks and get a very clear and detailed picture of an HIMS implementation, we decided to start with a small pilot project. This pilot project will be a learning experience, not only for the client but especially for the ELCT project team. Based on the experiences of this pilot implementation plans will be made for new implementations and for the concurrent further development of the ELCT implementation team.

That being the case, the pilot site should be chosen based on the following criteria:

- ✓ The stakeholders involved must want/need a HMIS implementation;
- ✓ The facility must have an adequate complement of staff that are able and ready to use the HMIS;
- ✓ It should have a stable electrical power system for the safety of equipment;
- ✓ It should be small, with the minimum infrastructure requirements or the possibility of having them;
- ✓ It should be accessible, reachable and near to the project office for easy support and follow-ups;
- ✓ It should have an internet connection which is needed for remote support and care2x development/customization.
- ✓ The facility management should be committed to be responsive, communicative and cooperate with the project team to make things happen.

The management of the pilot side must be aware of the risks of being a pilot site. So, although the project team will do everything within their ability to make the project a success, the management must be flexible if unexpected problems arise. The project team will not start a new project elsewhere before this implementation has been stabilized. This will mean that all the problems have been solved and there are no surprises anymore.

Of course it is not necessary to implement all the modules of HMIS before starting a new project in another hospital. It might also be considered to just implement HMIS for only one or two processes.

The pilot project will serve several purposes:

- ✓ Build up experience, knowledge and skills with regard to an HMIS implementation and the operation of Care2X;
- ✓ Create a fully satisfied new client, which will be a supporter of Care2X and of the ELCT project team. The pilot site can act as a showcase for new clients and the end-users of Care2X can serve as ambassadors of this system;
- ✓ During the implementation, several important lessons will be learned. It is important to evaluate the implementation with the client, and to document it very accurately;
- ✓ The new knowledge and skills can be used for the further development of the implementation/change management team, also to make a more accurate assessment about the capacity needed to implement, manage and maintain Care2X in other sites.

Based on these criteria for the Pilot Project, a hospital was selected as the pilot site. Part of the information described in this Change Management Guide is therefore based on the experiences of the implementation in this hospital.

For future implementations, the Pilot Project Hospital can be used as a reference site. Healthcare facilities that are considering an HIMS implementation might wish to visit Pilot

Project hospital to see and hear how the HIMS is working, the practical advantages and consequences, the preconditions for such an implementation, the way the implementation was carried out, lessons learned etc.

The criteria summed up for the selection of this pilot site might as well be used as an initial set of preconditions for new clients. During the discussions with potential new clients these preconditions, that are also essential for a successful implementation, must be mentioned and agreed upon.

Vision

The core of the change management approach is a joint workshop. Based on preparatory work including a technical assessment (step 4) and an analysis of the stakes involved, all health workers develop a shared vision of the future using the HMIS (see also Step 7).

The stakeholder analysis has provided us with a lot of information about the present needs of the different stakeholders, their position towards the implementation of HMIS, their concerns and relative importance for the success of the project. However, to get a clear focus, an estimate of the importance of the HIMS implementation, a sense of urgency, and to develop commitment, it is also important to have a clear common vision. This vision includes both the objectives of the Healthcare Facility, as well as the application of an HIMS and its consequences. Up till now, the vision of the ELCT on Healthcare and especially the vision on the application of an HIMS in ELCT hospitals has not been made explicit and specific (*"Improving ELCT operations, management and services delivered through her institutions"*). It is worth making an effort to discuss this issue with the ELCT management.

Business Case

A well elaborated business case can enhance the vision and commitment for an HIMS implementation. In this section, as an example, a business case is briefly described that has been discussed with representatives of the Pilot Project hospital:

In the workshop that was held on Sunday 13 May 2009, which was attended by twenty-one (21) staff members from the Pilot Project hospitals, we tried to derive the benefit they can expect from the system. Our intention was to have true figures in terms of income, expenditure and estimated loss in order to see how each can be increased, improved and reduced, respectively.

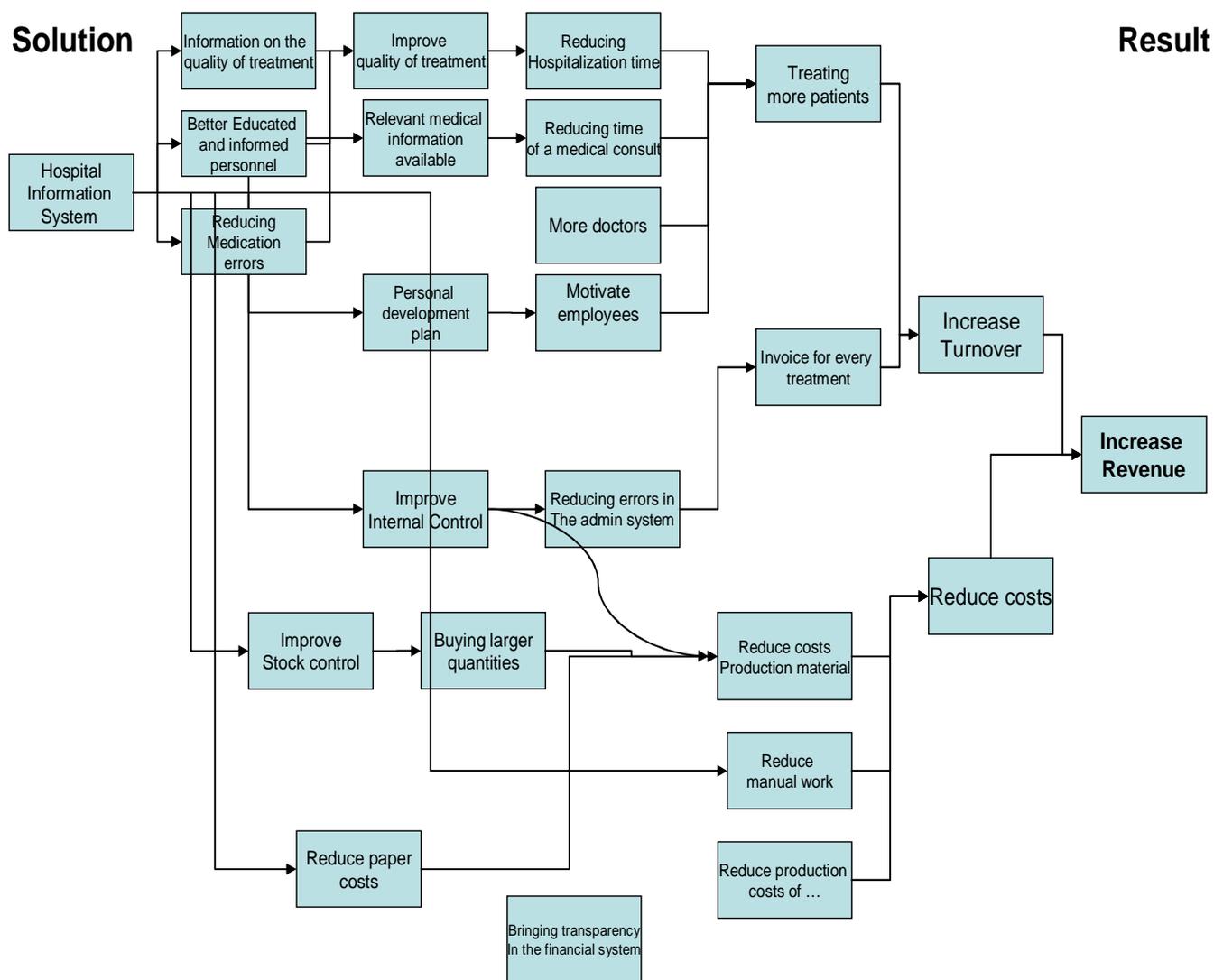
However, we faced a problem here due to the lack of transparency in hospitals between the management and the rest of the staff members. If the management is consulted in the absence of others, it will not give a good feedback if those who produce do not know what they are struggling for and for whose benefit.

Given this shortcoming, we have an excuse for stopping everything since we do not get the information we want to back up our conviction. However, this should be taken as a problem in its own right which needs to be addressed through change process. Management should understand the opportunity cost between the two; sharing important information to staff or its opposite.

In addition to this, and while that is not yet to be a success, we can use an ideal concept of what HMIS will result in as a benefit and how improving one aspect of service delivery may result in the improvement of others targeted at generating more income, controlling

expenditure and stock, together with reducing the time needed to deliver services, hence quality improvement and more satisfaction for the clients.

The benefit logic diagram below is a symbolic picture for the added value as a result of HMIS implementation. It can be discussed together with hospital management and all staff for all of them to see they understand what benefit they can derive out of HMIS implementation.



Description of the future situation

In this section a brief description is given of the possible future state, after an HMIS has been implemented in a Healthcare Facility. This future state will not be reached within a few months, not even within a year. It will probably take several years of hard work. Hard work that includes redesigning the business processes, improving and adapting the ICT systems, motivating and training the employees, and developing strong leadership. Making such a description, during each implementation project, with the stakeholders will strengthen the vision and commitment, and it will help to design a realistic project planning and realistic expectations. When we have defined the desired future state (the 'TO BE situation') and we know in detail the present

situation (the 'AS IS situation') we can design the transformation map, the path we have to travel to realize our goals.

Improved communication

When health facilities start to implement ICT, and particularly HMIS, and the system becomes fully operational, the future of healthcare quality will be greatly improved. Facilities will be able to communicate easily with all the stakeholders that are providing healthcare as they share the status of the facility, reports, procurement, and for many other reasons. Communication among staff in the facility during the process of service delivery will be much improved, faster and accurate, hence a major improvement in services.

More education and skills advancement

Due to the difficulties in sending workers for short-term and long-term training because they are in short supply, they will be able to advance their skills and career development at the facilities in order to access relevant materials for free, or little payment, through the internet.

Time spent on service delivery

The substantial amount of time currently spent by patients in queues while waiting for health services will be highly minimized. Not only that, but the quality of care that is delivered will be more systematic and improved.

Security and confidentiality of patient treatment history

Patients' treatment history will be more secure and can be accessed whenever needed. It will not be possible for everyone to get to the information that is stored in the database as it is sorted by files that are not secure and that offer no confidentiality. Life will be made easy for doctors who will now be able to perform all their duties using a computer system without the need for paper work which takes up so much of their time.

Statistical data and generating reports

Facilities will be able to generate any report that is needed and give any statistical data since they are automatically generated by the system. The time needed to compile these data and develop reports will be reduced and subsequently used to fulfil other responsibilities.

Human Resource Management

Computer systems should be able to simplify and improve the human resource management in the facilities. The system will be able to indicate who has done what and schedule tasks for staff. This will enable the proper utilization of human resources and help hospital management to balance manpower requirements.

Process analysis and redesign

An HMIS is a tool that can be used to work more effectively and more efficiently. This can only be achieved when the hospital organization is willing to reconsider the procedures they are using now. The analyses of these procedures and business processes are therefore an important phase of the implementation project.

Such analyses can be done during workshops in which the present workflows will be described by the 'process owners' and then discussed with the key individuals at the hospital, who are involved in executing these processes. Once the present AS-IS situation is described, the future TO-BE situation will be discussed: *What will the workflow be if an HMIS is used?* This type of discussion is very important. The key individuals at the hospital can bring in their knowledge and ideas and this will serve to strengthen the commitment to and ownership of the project.

Once there is agreement on the workflows, the new processes and procedures should be carefully documented in workflow diagrams. These diagrams consist of a description of all the process steps, options and the related information flows. Furthermore, the organization chart can be added to the process diagrams (which person is responsible for the process step, which official should execute the task, and who should be informed).

ANNEX 4: Implementation

At this point, a number of issues should be considered, see the diagram below:

Summary of Change Implementation

	Making it essential (Sensitization)	Getting it ready (Planning)	Making it happen (Implementation)	Making it stick (Sustainability/ institutionalization)
Build a compelling case for change	Build case for change within business strategy context	Quantify the case for change	Review & refresh case for change	Ensure case for change is still relevant
	Develop Benefits model	Design benefit realization process and identify quick wins	Track benefits and realize quick wins	Drive out and review benefits
Engage the leaders at every level	Build commitment amongst leaders	Coach leaders to enhance performance and lead the changes	Coach leaders to drive implementation through role plays & simulation	Formalise leadership development programme
Win the commitment of critical stakeholders	Identify stakeholders and develop engagement plan	Engage stakeholders and manage expectations	Manage on-going stakeholders engagement	Use evidence of stakeholder support to embed the changes
	Define and launch communication strategy	Prepare communication & evaluate readiness for change	Communicate to target stakeholders as planned & get feedback	Assure the communication of all realized benefits
Design Business to deliver what is important to you	Define the objectives of the game. Agree on the future business architecture. Assess the current state.	Develop the detailed physical design and assess gaps	Implement changes to systems, processes, structure and people as appropriate	Shakedown and tune the physical design and embed the behaviors
Drive the programme to deliver the business outcomes	Design a high-level Programme, governance and rationalize existing projects	Develop implementation strategy and plans – assess risks	Mobilize implementation teams and manage	Post implementation Review, capture knowledge, define further actions.

Prior to system implementation in the hospital, a number of things that will determine and guide the implementation process should be identified and accepted among the project team members and the key people in the designated hospital. The project team should have a working session with the hospital administration to discuss and agree on how the whole process will take place. Below are the key things that need to be considered and discussed:

- A general requirement analysis for the hospital.
- Infrastructure.
- A requirements analysis for the software.

Time frame

The project should work out with the given facility the estimated time required to implement the system. An agreement should be made about the time frame for setting up a local area network (LAN), basic computer training, server installation, HMIS installation, training for the HMIS, and the testing period.

Human Resource

The following people will be needed during the implementation of the software system:

- Programmers for system development and minor customization.
- Change management team for training.
- ICT technician for basic computer skills and HMIS training.
- A contact person in the facility who will work with the project team while on site and for any other communications.
- Local IT company/technician to assist in LAN installation.
- Hospital management/administration to assist with any administrative issues.

Resources/materials

- Training materials for basic computer skills and HMIS.
- System database and script server.
- Change management guideline and other related materials.
- Care2x software.
- Linux installation CDs for the server.
- Second-hand computers to be sold to the hospital in case they need them for HMIS implementation.

Infrastructure

- Depending on the number of points where computers will be used, there should be a functioning Local Area Network (LAN) so as to enable the sharing of computer resources.
- Computers should have been properly installed and fitted out with up-to-date anti-virus and spam programs.
- This task is the full responsibility of the hospital. The project will give only support when necessary.

Limitations

- The facility should only expect a system server, HMIS software and programming skills from the project during implementation. Other costs, such as those of a Local Area Network, trouble-shooting of the LAN, and computer maintenance and other software, should be taken care of by the hospital.
- If the facility does not provide enough cooperation to the project and commitment to the system development, it will not be considered for the roll-out.
- When necessary, and for the sake of speeding up the implementation process, the project will facilitate training for basic computer skills.

Service Management

Given the fact that hospitals do not have any technical employees (yet) for IT support, the project team will continue to function as a support desk when hospitals start using computers in their day-to-day operations. They will report all problems and queries about the software to the project technical team for support. The project will assist with the maintenance of computers

and the network at the starting stage to make sure that will not draw them back once they face more problems.

However, the project is working on modalities that will enable hospitals to have their own technical employee(s) who will assist with ICT training and with fixing computer problems. In situations where the health facility is unable to hire a technician, we will train the existing electrical technicians to be able to solve at least minor problems with computers together with network trouble-shooting.

HMIS Implementation

This section is to a large extent based on the experiences with the Pilot Project implementation. It might be noticed that at certain points the execution of the implementation was different from the way in which it had originally been designed, i.e. the optimal situation. That's the way things go. There will always be a gap between the theoretically optimal execution and the real operation. In that case it is important to evaluate why the real operation is different and what are the consequences and risks for the success of the project. Sometimes it necessary to lower the level of ambition and to take more time to finish to project. These considerations are valid as long as there is still a strong commitment within the Healthcare facility to make the project a success. However, if there are any lingering doubts about this commitment and about the ownership of this change process, and these doubts remain, it might be sensible to stop the project and move on to another new client, who is more ready for this change process.

Interviews/discussion with the stakeholders

This is one of the most important components in the change process. After identifying the stakeholders of the HMIS implementation, they should be given the opportunity to present their thoughts about it. It might not be possible to reach all of them for many reasons, and others might not be ready for the interview. In this case, at least a few key players and those with a lot of influence should be contacted for an interview, say Doctors-in-charge and other management team members. Also junior staff members who are the end-system users should give their views.

However, one thing should be considered here. As far as ICT implementation (specifically HMIS) in FBOs is concerned, it will be found that, the need for computerization does not come from the beneficiaries' side but from the project. The integration of ICT in health care delivery is a new thing to the majority of those working in the health sector and, for this reason, the interviewing aspect has to be awareness-building or advocating discussions with stakeholders. This is the case for most of our intended beneficiaries.

When it turns out to be that way, it should be the responsibility of the project to make sure the idea is widely shared and sold to stakeholders. The point at which stakeholder will have enough confidence to see the need for implementation and accept the costs linked to this, will be much clearer to them. Any worries, challenges and unknown expectations should be discussed well for clarity and any agreements reached will have to be written down for the sake of reference and as a guideline for future procedures.

Since the intention is to have hospitals accept ICT, the discussion should lead them to see that *they* are the ones who are demanding the technology, having learned what this will mean, and not the other way around. At this point, the idea of ownership will call for accountability and a readiness to take risks believing that they can count on the project to do the work.

Implementation strategy

The business case analysis has given a clear picture of the most profitable processes to support with Care2X. Furthermore, there was also the general idea of quick 'wins'. Based on this information added by the results of the stakeholder interviews, an implementation strategy is defined for a particular Healthcare facility. Important elements to take into account when defining this strategy are:

- Training programme: since most of the employees probably have no experience in using computers, the training programme can establish a strong foundation for the project.
- Quick wins
- Reducing risks
- Build up confidence
- Transparency: this can be obtained by clear, open and honest communication.
- Support: it is important that the expectations of the stakeholders and employees involved are met.
- Introducing an HMIS will mean a fundamental change process for the Healthcare facility involved. People want to see that the system works and that it will help them to do a good job. Furthermore, they will find it hard to change the way they used to work. So they need support and to be rewarded if they do so. Think about 'carrot and stick' mechanisms, but try to keep it positive. Rewarding people will have a much more profound effect than punishing them.
- Select 'champions'; employees of the healthcare facility who will support the project and who will convince and help their colleagues. These people will play an important role in communicating all the aspects of the project. It is important to establish a strong relationship with the medical staff as well as with the management of the hospital.
- Visibility: it is important that the project and the results are visible and associated with success.

A small team should be formed which will act as a steering committee. It should consist of project team members and selected staff members from the hospital who have shown themselves to be active in the change process, particularly in the technological uptake. The team should meet at least once a week to evaluate the process, correct mistakes and put new strategies in place for the next steps. Having hospital staff teaming up with the project will smooth the process, create a sense of ownership, and sensitize the rest of the hospital staff team.

Communication Plan

The whole process of change management and implementing an HMIS needs good communication between the project team and the hospital and the owners of the hospital. It is important to be transparent and open in all communications. The communication plan should therefore involve the top level management at the diocese level who are the central management decision-makers. Ideally, hospital *owners* should be involved too as involvement in communication is not bound only to those who are physically working in the hospital. It is also important to communicate to other stakeholders such as government, and other partners, in order to make the change process easy. To support the implementation, relevant messages should be communicated 'tailor made' to all the parties involved. All sorts of methods can be used to pass these messages on: e-mail, letters, newsletters, meetings in which the doctor-in-charge or, for example, the head of a department will point out the importance and headlines of the project, workshops, training programs, etc. It is important that the right messages are communicated in a coordinated fashion. Success must be celebrated, but mistakes and failures should not be hidden. Transparency and openness are the key-words.

Given the existing situation in hospitals whereby every piece of information is centralised to the doctors-in-charge, it is important for a new strategy to be used for effective communication. Doctors-in-charge are not available at the work stations for most of the time and have many

other things to attend to. Consequently, they are generally not good at communicating information. It is therefore important to have one person from the hospital side as well as someone from the project side in order to channel information through them: they are the ones who will make sure that each group is well informed about everything that is taking place, or that will take place. They will organize all the meetings, workshops, training courses, and any other program as and when it will be needed.

For the sake of simplicity, all e-mails from the project side will be copied to the project mailing list to enable all members to keep track of the discussions.

Training programme

Since most of the employees probably have no experience with using computers, the training programme can serve as the bedrock of the project. For the same reason, the importance of the training programme cannot be overestimated. The content, presentation and planning of the training programmes should be given a lot of attention. It will also take a lot of capacity.

It is most likely that the majority of those working in the administration department will never have seen a keyboard before. As they are not even familiar with using a typewriter, introducing a keyboard will take some time. To overcome this obstacle you have to come up with a very attractive system that is immediately interesting for all those involved and that will clearly provide them with a strong set of advantages. This system is definitely the internet. This is the killer application for the introduction of a computer system. When using the internet or e-mail, people will acquire both knowledge and a skill and it will be very functional. For the medical staff, online knowledge systems such as Medline™ might be very attractive.

When training hospital employees be aware of the fact that the average age of people working in the administration department is between 40–60 years. These people have a very slow training curve with respect to the medical staff (average age between 23–40 years). However, women are generally more positive than the men about attending the training sessions and they are less resistant. For this reason it is not efficient to mix these groups up together in a training programme. Furthermore, people will not like it and it will not stimulate them if they have to work together with people who can grasp the theory and acquire the skills much more rapidly. We therefore suggest creating different training groups based on age and profession and giving them, after the course, a killer application like the internet or medline, to develop their skills further.

The training programme might have the following structure: Based on the implementation strategy, groups of employees will be selected and formed. They will receive a general basic computer training course to provide them with basic computer skills, to create awareness about the potential of computer systems, and to create enthusiasm for using the computer. The basic computer skills needed should be along the following lines:

- 1) General information about computer hardware and software.
- 2) How to switch the computer on and off.
- 3) Introduction to the different types of computers operating systems.
- 4) Working with MS Office (hints on word processor, spreadsheet and PowerPoint).
- 5) Introduction to internet browsing and emails.
- 6) Introduction to computer networking.
- 7) The importance of data security and confidentiality.

After the course in basic computer skills, employees will have the opportunity to use some dedicated computers in their own time to further expand their knowledge and skills. For instance by using computers that have been installed in the library for this purpose.

After the basic training, the employee will receive a dedicated training course to train them in the functionality of the HMIS, e.g. the functions of the HMIS that they are going to use. This HMIS training must be held just before the system is available, so that the trainees can use the HMIS shortly after the training.

It is important to carefully document each training programme and to give the 'students' detailed manuals for each training course, as a reference book. Such a manual might be an important showpiece of the ELCT project team. After an employee has successfully finished a training course, he/she could receive a certificate as a reward.

Given the different experiences of the students with education (e.g. imitative learning) the training courses should be designed in such a way that the students have to take the initiative and perform exercises. Furthermore, the ELCT project team must make clear arrangements with the management of the Healthcare Facility, that the preconditions for a successful training programme are met (e.g. employees must have approval to use the computers and certain software programmes after they have finished the training course).

Installation of HMIS

Once users are trained in basic computer skills and are comfortable about using the computers for simple applications, then server and software installation should start at the given site. This task should take a maximum of three (3) days including testing of the system after installation to see whether it works fine at the site with the client computers.

Software training

Immediately after the installation, software training should start - especially for those who will be at the point of service where the system is in use. The key people who should be trained are the receptionists, pharmacists, doctors, cashiers and laboratory technicians. Each user should be trained until he or she becomes comfortable and accepts the system.

Because of the tight schedules of hospital workers, a trainer should spend the whole day at the site in order to exploit whatever opportunity is available in addition to the planned training timetable. This exercise should be scheduled for two solid weeks and one extra week just in case the timetable is interrupted by other activities, either personal or official.

Using the system

After the three-week training period, the hospital should start using the software during service delivery. It is not necessary for all the modules to be used the first time around. Starting with registration, the rest of the modules can be in use depending on what the hospital needs and the extent to which respective users are comfortable about using it. This period should go hand-in-hand with further training for those who were not trained during the previous phase and with advanced training for those who have already been trained. A close follow-up should be made to see how they use the system and assistance should be given with any query they might have.

Acceptance of the system by the users

After a period of three months from when the software first started to be used, the evaluation should be carried out to see how far the users accept the software. This is the time when comments will be given about what should be added, corrected or removed from the system. Comments made by the users should be listened to carefully and their suggestions should be implemented or otherwise explained if it is only a matter of understanding something.

Checking for system functionality

Once the designated hospitals start using the system, there should be ways to check whether the system is working well or not. Since Care2x software generates a report for every transaction that takes place, the reports that are produced should be printed out and their validity evaluated. This can be done quite easily as both the computers and the manual system will be used simultaneously during the initial phase to enable users to get used to Care2X and to identify problem areas or sections that need to be improved. This will demonstrate the stability of the system and allow room for improvement.

Once the stability, correctness and usability of the system has been proved, users should stop using the manual system and from that moment onwards base their activities on computers. However, when major problems do occur, such as lengthy power cuts, users should be able to switch back to the manual system. Depending on the human resource capacity within the facility, an agreement should be reached about whether or not the data will be entered into the computers retrospectively when the power comes back, or if it should just remain in paper format and that this information will be remembered during the reporting process.

It is considered very important to check whether the automated process is working well. Therefore several checks (in the process flow) must be designed. For instance; make a print-out to check patient registrations or patient admissions at the end of each day. If things go wrong during the process flow you will be able to correct them at a very early stage. It is important to develop an 'undoing' process for each automated process, just in case the HMIS is not working at a certain point in time. It is important to have a manual fall-back scenario.

ANNEX 5: Monitoring and Evaluation (M&E), Lessons Learned and Follow-up

Once the software is in use at a given site, the project team should come up with an appropriate design to get users' views as a way of evaluating how they see the system as they are using it. Interviews, questionnaires and service improvements can all be used to see whether the HMIS is functioning as per the designated purpose. Lessons learned are very important and should be documented. Continuous follow-up should be made after the trial period until when the hospital can handle things on its own. The following lessons learned were extracted from the ELCT pilot project.

Project Ownership

Most of the health facilities have no idea on how to apply ICT in health care delivery, let alone creating a plan to implement it. For this reason, the project team is responsible for selling the idea accordingly. In doing this, the hospital should understand and accept that it is the owner of the system. The whole process of ICT implementation should fully involve the hospital. It should contribute some identified costs in terms of cash, time and in strategizing workable modalities to make the implementation possible.

Training and staff turnover

Care2x training was much more extensive than planned in the Pilot Project hospital. This was caused by disorganization of management on the training timetable. There was no proper communication between the administrator and the junior staff about who had to attend the training course and when. In addition to that, many of those who were trained left the facility to start new positions at government facilities, even before the system was installed. In one particular case, all the receptionists left soon after the training course had ended. No replacement was found for some time, hence no one could use the system after installation. When new staff were found we had to start the training afresh.

Power Problems

Despite the fact that this year we have not had to contend with any power problems in the country, the line connecting Saint Elizabeth Hospital Arusha (SEHA) has large fluctuations which has caused us to lose some equipment. Sometimes the hospital could be without power for an entire day.

Resistance

The majority of system users have accepted HMIS. A significant contributory fact in this was the step-by-step procedure that was used to introduce the system to the facility. However, some department heads were reluctant and actively discouraged their subordinates from using the system. We have been discussing this in our meeting on Wednesdays and improvement has been observed. Its only pharmacy where more has to be done to achieve acceptance of the system.

Patient Population

SEHA is one of the hospitals that has won the trust of the public, especially the poor. As a result, there is always a massive number of patients that stretches way beyond the capacity of the existing manpower. Since the system users have not yet acquired enough experience with computers, they find it difficult to attend to the patients and use the computers at the same

time. This is mainly an issue for those working in the pharmacy department, the laboratory, the Out-Patients Department (OPD) and the billing unit.

Meetings

Having seen the challenges described in the previous chapters, we recognized the need to have frequent meetings with the heads of each unit, together with people from the administration department, in order to team up with them. Yet, it has been a challenge to meet as scheduled because of interruptions by other programmes in the hospital. However, these meetings are very important since they have made those who are affiliated to the hospital see the project as their own. For example, at the Pilot Project Hospital, the ELCT-IT Change Management Team had weekly meetings with the department heads and representatives from hospital management, during which the challenges, problems and obstacles were addressed and possible solutions identified. This approach resulted in a very successful output in the HMIS application at the facility.

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ANNEX 6: Workshop with Evangelical Lutheran Church in Tanzania (ELCT) Church Leaders and Medical Secretaries

February 2008 - some excerpts:

1.1 Devotion

The Assistant Bishop from Dar es Salaam led the devotion by reading a verse from Philippians 4:13 and, after a short sermon, it was closed by the word of prayer.

2.0 Application of ICT to ELCT

2.1 *What are the problems that affect the health sector in ELCT?*

There follows a brief summary of the challenges that our hospitals are facing:

- Shortage of manpower.
- Inadequate facilities and equipment.
- Poor infrastructures/no renovations.
- Poor communication.
- Inadequate funds resulting in a failure to purchase drugs and low salaries, or salaries not being paid on time.
- Poor record-keeping and statistics.

2.2 *What challenges in the healthcare facilities and hospitals can ICT help you overcome and how can it help you to provide better services?*

To summarize:

- Increased salaries.
- Better use of human resources (e.g. doctors).
- Increase in efficiency as more patients flow into our hospitals.
- Facilitate communication between the department and the outside world.
- More finances due to better tracking and a high level of transparency.
- A modernized and updated hospital.
- Capacity building for hospital staff on ICT issues, hence better services.
- Reports.
- IT will also motivate staff to join our hospital/healthcare facilities.
- Increased interaction and problem-solving through IT.
- Through ICT, staff can learn more and increase their knowledge.
- ICT will help staff and patients to quickly share information and opinions.
- ICT will make the work easier and will allow the staff to communicate more effectively.

3.0 Situating ICT development

3.1 *Vision Forecast for the ELCT health sector in 2015*

- Marvelous, inspiring healthcare.
- The hospital will be technically improved and well-equipped with ICT.
- Improved quality of health facilities and services.
- There will be more answers than questions.
- Well-organized learning hospital.

- Increased knowledge, with a positive attitude towards, and practice of, ICT by our health practitioners.
- More sophisticated equipment in our health facilities.
- Computers commonly used for the tasks we are working on today.
- Hospitals and dispensaries with good services and committed workers who are well-paid as in other developed countries.
- Our entire hospital will be computerized and able to provide a quick service.
- Doctors will be attending seminars in their offices thanks to the latest technological developments.
- With the rapid developments in the ICT sector we can assume that the hospital will eventually be able to register patients online and that consultations with doctors could also take place online. In addition to this, it should be possible to pay online, obtain prescriptions online, and have medicine sent buying online – therefore, there would be no hospital for patients but for trainees.

3.2 What factors hinder the realization of the above-mentioned vision?

- Poor infrastructure.
- Conflicts.
- Low financial flow.
- Corruption.
- Poor conduct.
- Lack of well-trained, committed and disciplined staff.
- Lack of good diagnostic equipment.
- Personal benefits from present non-transparent situation.
- Inefficiency of staff.
- Lack of cooperation from other partner.
- Inadequate equipment.
- Lack of commitment from staff, hospital management and top diocesan leadership.
- Not enough education on ICT and the benefits that could be accrued as a result of using ICT applications.
- Inadequate income in the hospital due to poor people living around the catchment area.

3.3 Factors that help to realize the vision

- Good equipment and computers.
- Relations with government and advocacy (CSSC, Diocesan leadership).
- If strategy planning is carried out in the hospitals.
- Control: hospitals to track transactions in order to eliminate a loss of funds, which may be fairly rampant.
- Strong leadership.
- Human Resources - more health workers well trained and committed, to encourage distant learning through ICT, to have a continuous professional development system in place, and to have more medical schools to train our people.
- Regular training sessions and workshops.
- Financial Resources: a hospital needs financial support
- Revolving funds for drugs
- Quality: offer excellent services to clients; that way, more will come and more income will be generated as a result.

Comment: Most factors are largely under the control of ELCT!

3.4 A case study of a hospital in Tanzania where ICT was applied produced the following results:

Major achievements with the application of an HMIS are:

- Minimal staff turnover.
- Increased staff salaries.
- More funds collected.
- Higher number of patients.
- Higher patient satisfaction.

3.5 Key factors for change

Information and Communication Technology (ICT) involves a change in attitude and mindset and applying oneself to achieve better results. Consequently, the key factors for change, or to insure that our hospital will utilize ICT, are:

- Bishops, as the top leadership of the dioceses, to back up the process.
- Diocese Health Committees to implement strategies for their diocese health units.
- Hospital Administrators to closely monitor the process and carry out follow-up activities to ensure that the systems are in place, that the staff use ICT to enhance the services they provide, and to ensure sustainability.
- Hospital staff need to be properly oriented to see the importance of ICT in their day-to-day activities.
- The ICT ELCT Unit to provide support to the health facilities.