

Improving quality and affordability of healthcare in Africa through an eHealth package

The art of learning and integrating

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Introduction

Over the past years, IICD and its partners gained valuable experiences with applying Information and Communication Technology (ICT) to overcome various challenges in healthcare in Africa, including Tanzania, Ghana, Malawi, Mali, Uganda, Zambia and Zimbabwe. The major challenges in the implementation of both telemedicine and health management information systems (HMIS) in health facilities can be summarised as a “fall back” from enhanced performance with the eHealth applications to a lower level. Happily, this is not the general pattern, but there are a number of incidences and they need to be addressed. In doing so, a number of new and important insights were developed that are relevant to ICT development in the health sector worldwide.

In this study, we focus on Tanzania, where IICD works closely together with the Ministry of Health and Social Welfare, the district health authorities in Mwanza and Christian Social Services Commission and the Evangelical Lutheran Church. IICD assisted in the development of a national eHealth strategy and Health Management Information System (HMIS) applications and telemedicine applications in over 30 health facilities. Mobile and tablet applications are under development and focused at dispensary and community level. The analysis of the Tanzania case is based on observation, interviews, four focus group sessions and two partial studies on a number of actual cases.



Influences that reduce performance of a health management information system

HMIS implementations are based on a participatory change management approach, which was developed in Tanzania¹. This approach² proved useful and resulted in a high level of ownership with the staff of the health facilities. As a result the HMIS operates well, it generates substantial additional income, reduces losses, eases work and according to the patients results in improved quality of care and shorter waiting times. The approach was also tested in Malawi with similar positive results.

Nevertheless in a number of cases, the performance started to deteriorate over time. A system perspective helps to understand the reasons. Health care can be conceptualised as a system. Change within a system always calls for reactive forces that search to pull back the system to the previous status quo, either consciously or unconsciously and often the outcome of a myriad of interactions. This is even logic, as it also explains the stability of the system. What main influences could be detected that pull back or inhibit performance improvement? A quick and not exhaustive scan learns that the main negative influences are the following:

- External influences like electrical power problems, or lack of medical supplies at national level;
- Insufficient clarity in business case. While clear for HMIS, this especially applies to telemedicine, not only about how costs and benefits are distributed, but also the rules and procedures as well as other incentives for professionals like telemedicine being a part of certification and continuous professional development.
- Staff turnover, insufficient training etc.

¹ Evangelical Lutheran Church of Tanzania, 2010. The change management guide for HMIS implementations, Arusha.

² Moens, N.P. Broerse, J., Bunders, J., Janszen, F. (2008) Information and Communication Technology development in Tanzania: a case study of innovation processes. International Journal for ICT and Change Management (3(1), 33-62.



A whole set of influences can contribute to reactive forces that search to restore the previous situation. These influences can be attributed to malicious behavior like new management moving in that prefers a lack of transparency for their own purposes. But negative influences also come forth from the mismatch between the 'old system' and the new one. For example, national procedures that are still old-fashioned, like the health reporting that uses different colored sheets, which is less easy to reproduce exactly by computer. A very important aspect is that successful eHealth applications require paradigm and attitude shifts from the health workers, especially medical doctors. Shifts include from "isolated" to team player and more emphasis on evidence based, feedback and professionalism. As the role and the status of the medical doctor is partly culturally defined, this change requires a redefinition of identity. In education, this also proved for teacher a not so easy task. Another aspect are the changes in organisational dynamics due the ICT applications.

There are also positive influences that stimulate the use of eHealth applications like HMIS and telemedicine. These include the potential financial gains, to ease work and staff shortages, the need for health information for planning at district and national level, the attractiveness of ICT for staff, especially younger health workers.

By better understanding both negative and positive influences, IICD was able to conceptualise a new, improved approach towards HMIS and telemedicine that takes these influences into account: the eHealth package.

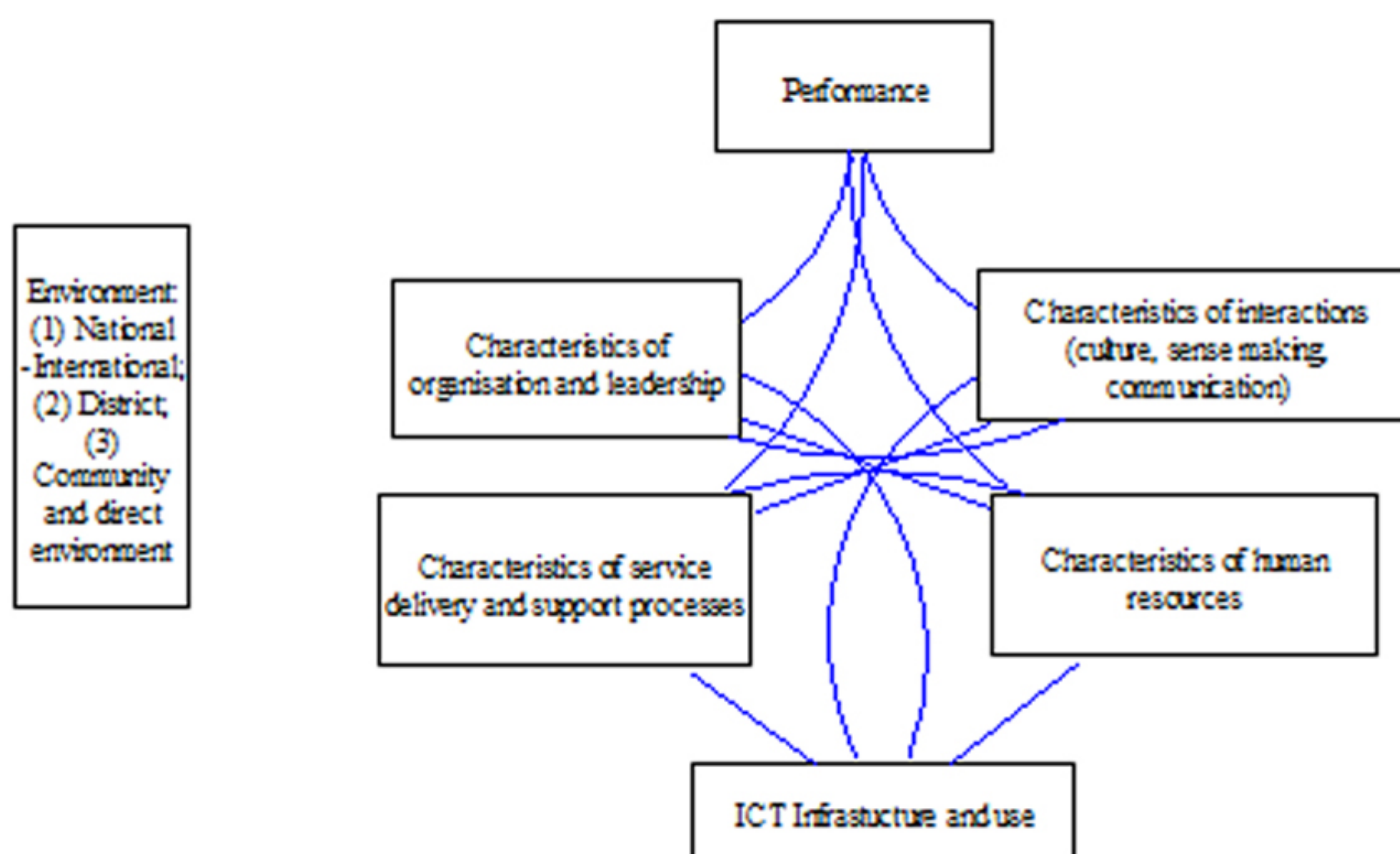
Concept of the eHealth package

The eHealth package builds on IICD's experiences with applying ICT-based solutions to the health sector. The novel aspect is to embed the participatory ICT design approach in comprehensive organisational change models. This results in careful scaffolding of different eHealth solutions and organisational interventions into one comprehensive package. There is also a need to develop a sound business case. Moreover, the influences of the external environment should be taken into account; positive ones should be reinforced and negative ones dampened off to the extent possible. These are dynamic and highly situational processes. This conceptualisation is explained below.

Embedding the participatory ICT design approach in an organisational change model

From its experience and from literature, IICD developed a very successful participatory ICT design methodology for sector-wide ICT applications, the so-called Round Table³ process⁴. This resulted in the smooth implementation of an eHealth application like HMIS. But the aforementioned problems with continuous performance improvement, taught that more has to be done. This especially applied for telemedicine for which the business case is less clear and which requires substantial organisational and procedural changes within a health facility and some specific institutional changes in the wider environment. Therefore the participatory ICT design approach has to be integrated with an organisational change model. A generic organisational change model⁵ is used. A generic model helps to explore and understand the specific obstacles to organizational performance. This is an advantage over a normative model that emphasizes certain solutions before hand. In the organisational change model the performance is a function of changes in the characteristics of:

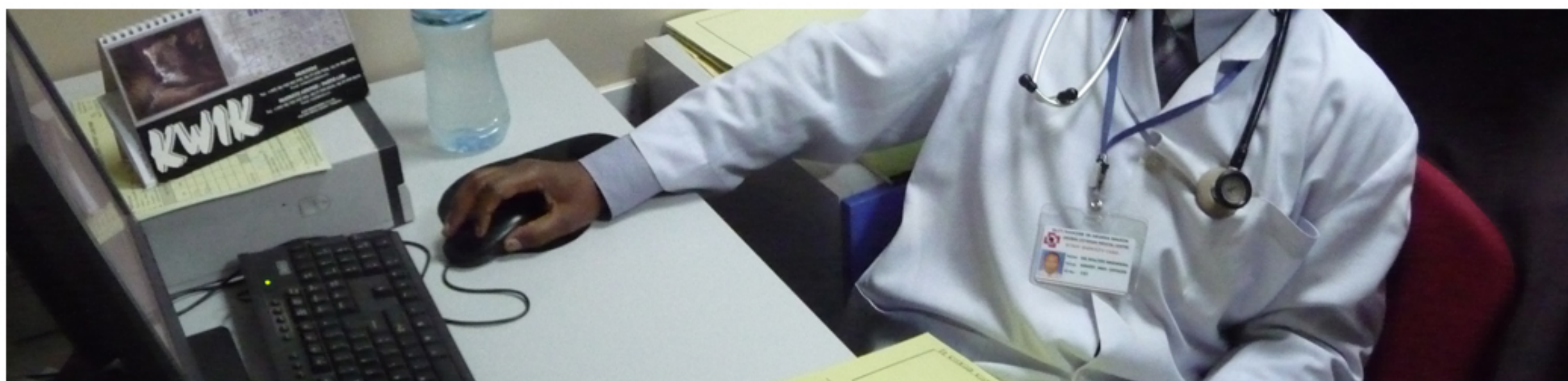
- Service delivery and support processes;
- Culture, sense making and human interactions in general;
- Human resources;
- Organisation and leadership.



³ IICD, the Round Table process, see <http://www.iicd.org/about/approach/roundtable>.

⁴ Moens, (2010), Innovation in sectoral governance and development, with ICT in agriculture, education and health. PhD dissertation, Athena Institute VU University, Amsterdam.

⁵ Caluwe, L. and Vermaak, H. (2003) Learning to change, A guide for organisation change agents. Sage Publications, California.



Combining best practices with eHealth applications and organisational interventions

These changes cannot come overnight, but have to be nurtured in a mutually reinforcing process. eHealth applications are supportive in this process. For example HMIS addresses directly support processes of service delivery. Using a participatory design approach strongly influences culture, sense making and human interactions in general- an area of great importance that stimulates hierarchy and isolation, or team work and continuous quality improvement. Telemedicine, on the other hand, complements human resources along with expert systems on mobile phones. Therefore the two eHealth applications should be complimentary to assure the proper organisational conditions are in place and to create a mutually reinforcing change processes.

The eHealth package is the best solution to bring the desired change about. HMIS helps to structure management, provides evidence of improvements and functions as the financial engine for eHealth applications as it generates substantial additional income. Based on the infrastructure and achievements generated through HMIS, telemedicine and eLearning can be incorporated in the daily operations in a professional manner. This learning trajectory is reflected in the gradual approach of the eHealth package. In addition to eHealth applications, additional interventions are required such as peer learning, and structured management reports. Focus groups and change teams contribute to a bottom up process of change and much desired change in attitudes such as a move towards team work and an increased quality of care. Benchmarking provides a mirror to check performance against results elsewhere of comparable health facilities.

Making a sound business case

To ensure financial sustainability of the eHealth package it is advised to apply HMIS in combination with a financial package such as the open source software WebERP. Increased income through better capacity use, less leakages and corridor clinics, might result in –very indicative 20- 40% income increase. This allows generating additional income not only to maintain the ICT infrastructure, but also provides funds for gradual improvement as well. Moreover, the reports and feedback generated, allows management to become structured and evidence based. For telemedicine the improved data and financial administration, allows to make small payments to consulting doctors and hence to integrate it in their daily work as a part of their duties.

Addressing external factors

External factors are addressed through a close collaboration with the district and regional health authorities. Also collaboration with health financiers (mostly insurers) is important. This is further cemented by customising and automating the medical reports and payments according to the preferences of the financiers.

IICD and its partners actively supported the development of the national eHealth strategy and could integrate the lessons learned into this strategy.

Trajectory of implementing the eHealth package within a health facility

To successfully implement an eHealth package, the start should be made with the *health management information system* and financial applications. Once this trajectory is well on its way, telemedicine and eLearning can be implemented. The implementation of the total package contains about 40 steps and takes at least two years.

The main steps for the HMIS trajectory are summarised in the table below:

Step 1 to 5: Awareness raising, participatory session with management and staff on priorities, functionalities and way of implementation, including contracting.

Step 6 to 9: Joint implementation planning, training, organisation of the automated data flow and development of a baseline.

Step 10 to 14: Implementation, trial periods and gradual transfer to fully digitalised data registration and processing (manual back up available).

Step 15: peer learning, improved reporting, focus groups, business planning and continuous improvement.

Other steps basically deal with developing telemedicine and eLearning and institutionalizing the use of ICT in the organization.

It should be noted that the basic trajectory of the eHealth package is standard, but there is a lot of flexibility possible to adapt it to the specific situation.

Results

This approach has been developed by the Lake Zone (DHMIS) program and the ELCT programme. So experience is still limited. Consolidation in some health facilities indicated a good pick up of performance. The first new implementation in Mugana (Bukoba area, Lake Zone) went very smooth. The second implementation is ongoing in Sengerema hospital (Mwanza area). An impact study is planned to start in September 2012.

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