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eTransform AFRICA



ICTs for **HEALTH** in Africa

*Information and communication technologies (ICTs) have the potential to transform business and government in Africa, driving entrepreneurship, innovation and economic growth. A new flagship report – **eTransform Africa** – produced by the World Bank and the African Development Bank, with the support of the African Union, identifies best practice in the use of ICTs in key sectors of the African economy. Under the theme “Transformation-Ready”, the growing contribution of ICTs to Agriculture, Climate Change Adaptation, Education, Financial Services, Government Services and Health is explored. In addition, the report highlights the role of ICTs in enhancing African regional trade and integration as well as the need to build a competitive ICT industry to promote innovation, job creation and the export potential of African companies.*

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INTRODUCTION

Countries in Africa spend significant amounts of their GDP on delivering health services through systems that are often inefficient, costly and lacking in transparency. Information and communication technologies (ICTs) have the potential to transform the delivery of health services across the continent in ways that not only increase efficiency but also improve accountability (World Bank, 2004).

The availability and quality of ICT services are growing rapidly across Africa, with mobile network coverage rising from 16% in the late 1990s to over 90% of its population in 2011. Growth in this sector has led to increased investments, decreased costs and rapid growth in technology-enabled services.

However, these gains in ICT infrastructure have not as yet benefitted

the health sector in a systematic way. Although there are many ongoing projects across Africa that attempt to improve the health sector through the use of ICTs, most remain pilots, few are evaluated and even fewer are designed or assessed for scalability. While a recent World Bank survey of nearly 150 active health projects revealed that a third had a specifically financed eHealth component, few were systemic fixes, and a gap remains in strategy, communication, capacity and available investment regarding ICTs for health system strengthening.

ICTs present a large, unexploited potential for transforming governance and transparency in the health sector in Africa to achieve “more health for money spent” and thereby improve the efficiency of health spending, both domestic- and donor-financed.

Trends and challenges

The overall trend in healthcare across Africa reflects the optimism arising from the general improvement in social welfare, as shown by the 10 percentage-point reduction of people living on less than \$1.25 per day between 1999 and 2009. While few African countries are en route to achieving the health-related Millennium Development Goals (MDGs), many are making significant progress. For instance, sub-Saharan Africa

(SSA) has experienced a reduction in child mortality from 180 to 129 deaths per 1,000 live births, and while there is still regional progress to be made to reach the MDG goal of 60 by 2015, certain countries with high under-five mortality, like Madagascar, Malawi, Eritrea, Liberia, Niger, and Tanzania, have already more than halved their rates of child mortality between 1990 and 2010. Similarly, while the entire region requires more progress to

reducing maternal mortality by three-quarters by 2015, Equatorial Guinea, Eritrea, Cape Verde, Ethiopia, Rwanda, and Mauritius have already more than halved their rates since 1990. Progress on MDG 6 is also visible in countries like Botswana, Rwanda, Namibia, and Zambia, where over 55% of people living with advanced HIV have access to antiretroviral therapy.

Although immense progress has been made, a majority of Africa countries are falling behind on their MDG commitments and existing strategies will not be sufficient. New approaches are needed.

The main opportunities for ICTs to positively impact the health sector reflect the remaining core challenges countries face in pursuit of MDG targets, and implementation of ICTs to assist in resolving micro-level challenges will only be successful if macro-challenges do not obstruct ICT capabilities. The systemic challenges faced are substantial and complex, and include:

- Insufficient skilled healthcare workers: It is estimated that Africa, which has 11% of the world's population, carries 22% of the global disease burden and more than 1.5 million additional health workers are needed to resolve the human resource shortage. Yet in resource-constrained health systems, existing workers are often inefficiently allocated, leaving service gaps in rural areas, or insufficiently monitored and motivated, leading to attrition and potentially
- poor quality of care delivered in the absence of training and knowledge support in the field.
- Lack of health information systems: Many low- and middle-income health systems lack sufficient technology to enable communication between households, care providers, and eventually, policy makers. The absence of these infrastructure elements increases the possibility of morbidity and mortality owing to the “third delay”, i.e. the delay in receiving adequate service after reaching a healthcare facility. The impact is felt most by people in rural areas, where delays are more extreme.
- Shortages of drugs, equipment and supplies: Without medical equipment and supplies it is difficult for health workers to provide the care they have been trained to provide. Sometimes, supply shortages even lead to health centre shutdowns. In 2010 in Uganda, for example, eight rural health centres closed because of lack of supplies, leaving people in the Amuru district without healthcare, and an additional twelve recently-built health centres have not opened for the same reason.
- Inadequate public information about preventable diseases: The simplest preventive solutions can lead to lives saved. For example, while HIV testing services may be highly available, without encouragement and clear communication about the details of the service they

may go underutilized. Or alternatively, if the general public was able to receive information about contaminated water sources – in the form of alerts about diarrhoea or malaria outbreaks – households could protect themselves from disease.

- Financing constraints: Often, care is not accessed because patients are unable to pay out of pocket. Also, governments remain challenged to provide adequate financial resources for seeding health systems infrastructure, research and innovations.

ICT as a game changer in health

eHealth may be defined as the use of information and communication technology (ICT) – including computers, mobile phones, satellites, software, information systems and digital platforms, etc – to enable, support and deliver health services to patients and populations. eHealth can make use of tools like mobile phone-based health (mHealth) applications, telemedicine systems, or eLearning programmes, and includes the digitization of a country's Health Management Information System (HMIS) or Health Information System (HIS). It is assumed that use of ICTs will lead to greater efficiencies in use of resources and greater efficiency in service delivery, a significant matter when the 2010 WHO World Health Report revealed that 20 to 40 per cent of all health spending was wasted due to inefficiencies. Investment in ICT has the potential to reform health systems,

extend services to underserved areas, and reduce waste and redundancy.

Data from the 2011 Global Observatory for eHealth (GOe) survey showed that some 83 per cent of 112 surveyed countries identified at least one ongoing mHealth programme, and 33 per cent identified at least one telemedicine programme within their country. Of the 31 African countries who responded to the survey, SSA nations were least likely to have established, institutionalized eHealth programmes in mHealth, telemedicine or eLearning. When these programmes exist, they are in either the pilot or informal stages of development. Yet the fact that over 67 per cent of the African WHO members responded to the survey is encouraging, indicating willingness to “mainstream” eHealth as a component of their health strategies.

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LANDSCAPE ANALYSIS

Though limited in quantity and rigour, there is evidence emerging that ICTs can address challenges of maternal and child health and infectious diseases in rural Africa. Hundreds of mHealth interventions to date have been piloted across the continent, for a variety of purposes including remote consultation, patient data management, referrals, supply chain management and health worker training. Some countries, like Rwanda, have implemented a comprehensive national eHealth System,

including programmes for tracking patient records, monitoring infectious diseases, managing drug and supply chains, telemedicine communications with health professionals in distant areas and eLearning and training for healthcare workers. With the proper telecommunications infrastructure and committed leadership, such strategies could facilitate new business and service models. For this reason, countries are experimenting with different types of applications, as outlined below.

eLearning and telemedicine

eLearning and telemedicine programmes have the capacity to improve human resources for health by enabling workers with the training and information, needed to respond to emergencies and crises. Several Francophone African countries, such as Mali, Cote d'Ivoire, Senegal and Burkina-Faso, have implemented an online platform (RAFT) that allows for web-based seminars, training, discussions and sharing of best practices between healthcare professionals in each of the ten participating Francophone countries. The Tunisian Society of Telemedicine and eHealth – an NGO composed of doctors, telecom engineers, and communications specialists – sponsors and promotes videoconferencing between health professionals in emergency cases. It allows for tele-diagnosis by professionals in hospitals at a distance,

and between the country's thirteen tele-radiology centres, three tele-pathology, two tele-optomology, six regional hospitals, general hospitals and six specialized centres, up to twenty remote sites can utilize the videoconference at any given time.

Other programmes targeting community health workers include Botswana's eLearning programme for community health workers at the KITSO AIDS Training Program, a public-private partnership between the Ministry of Health and Harvard Medical School. Other innovative forms of support for frontline health workers are applications like CommCare, from mHealth company Dimagi, which programmes various health worker protocols for different types of patient interactions into a mobile phone, complete with picture

and voice prompts for not fully literate users. Other creative ICT solutions for the human resource crisis include Switchboard's MDNet programme, a free closed calling network between all doctors' mobile phones in Ghana, which removes the cost and connectivity barriers to doctors seeking advice or assistance from their peers.

Such simple interventions could make a significant difference in attracting, retaining and improving the performance of limited health workers, like using mobile phone communication to improve referral systems, or creating an interactive voice response menu on a phone that contains knowledge reminders and remote training for health workers in rural locations.

Data exchange and analysis

In traditional paper-based reporting systems, collecting and exchanging quality and timely health data remains a challenge, as the process can consume the time and attention of health workers who are meant to be providing services instead, and can result in inaccurate or incomplete data. Electronic Health Information Systems (HIS) can help minimize time spent recording data, such as the HIS shared across Southern African countries Botswana, South Africa, Mozambique, Ethiopia, Malawi and Tanzania. The BEANISH programme – Building Europe-Africa Collaborative Network for Applying ICT in Healthcare Sector – is an open-source Java-based program that allows healthcare professionals to gather data and enter it into a digital healthcare system, which can be used for data analysis and management. Similarly, OpenMRS, developed by the Regienstrief Institute and Partners in Health,

provides a lightweight, user-friendly option for an electronic medical records system.

A unique feature of ICT-enabled data collection is that data can be viewed and analysed in real time so that care providers and policy makers can make lifesaving decisions based on evidence. Such tools can save health workers time and costs of paper-based data entry and transportation, as in a project in Guatemala when the World Bank reported a 71% decrease in data collection costs when using the programme Episurveyor on a mobile phone for data collection compared to paper. When the NGO Partners in Health employed a personal digital assistant (PDA) for tuberculosis results collection, the processing time of 6.2 days was significantly lower than baseline and control days with data entry errors reducing from 10.1% to 2.8%.

When designed appropriately, free and customizable software like Episurveyor, OpenXData and Open Data Kit enable remote fast, accurate and inexpensive data collection eliminating a large amount of burdensome work that distracts workers from their core duties. The Mobile Technology for Community Health (MoTeCH) Midwife initiative, for example, conceived by the Grameen Foundation and funded by the Bill & Melinda Gates Foundation, uses mobile phone technologies to

help Ghana achieve those goals. Using General Packet Radio Service (GPRS), Short Message Service (SMS) and Interactive Voice Response (IVR) technologies, MoTeCH surveys midwives, allows them to dial-in toll-free and record and update critical data about pregnant mothers. Another example, Child Count, is an SMS-based application that allows community health workers to upload patient metrics to an external database which is then monitored for irregularities.

Supply chain management

Weak supply chain systems across low-income countries – caused by poor road infrastructure that delays delivery, and poor electrification that eliminates the possibility of a cold chain – can result in remote health posts being under-stocked or stocked-out of essential commodities, such as contraceptives for reproductive-aged women and vaccinations for children. Further, the World Health Organization's estimate that 10-30% of drugs in the developing world are counterfeit could put millions of lives on the African continent at risk of unnecessary death and disease if those medicines make it into the system unnoticed. In Ghana, mPedigree employs Sproxil, a technology that uses barcodes and unique identification

mechanisms to track counterfeit drugs in developing countries.

The World Bank is currently conducting an evaluation in Zambia of the use of mobile phones to improve supply chain management. Other ongoing efforts include StopStockouts, in Kenya, which allows field-level health workers to report stock-outs by SMS on their mobile phones to a central database which then converts, via GPS data, to a geographic visualization of the problem in order to alert administrators and supervisors of the issue. In Tanzania, the SMS for Health project uses ICTs for supply chain management of malaria drugs.

Public health promotion

An AED-SATELLIFE project, the Uganda Health Information Network (UHIN) uses PDAs to provide early warning information about the spread of communicable diseases to citizens. The data collection element is four times as efficient and 25 per cent more cost effective than manual data entry, with the goal of surveying populations for crucial disease information. With the ability of mobile phones to track and record GPS locations, governments can be more informed about emergency disaster relief scenarios. RapidSMS, InSTEDD's GeoChat, and Ushahidi are all applications that have been used to assist governments with rapid response to emergencies from famine to flooding to earthquakes.

Aside from surveying public information for use by the government, there are many ICT for health efforts that aim to deliver key public health messages from the government to the public. Launched to encourage healthier behaviour that avoids future treatment costs, Praekelt Foundation's Project Masiluleke, a programme that offers free information about HIV testing locations via customers' mobile phones, resulted in 1.5 million calls to a local AIDS helpline. Mobile phones are also being used in Uganda in the Text to Change campaign, which seeks to increase knowledge and understanding of HIV/AIDS through SMS-based quizzes.

Health financing

Patients often forego care owing to the inability to pay healthcare costs out of pocket, and providers and health system administrators are struggling to make care truly accessible in low-resource environments. Considering that, by the year 2012, there will be an estimated 1.7 billion people with no bank account but who own a mobile phone, the proliferation of mobile money systems like M-PESA in Kenya is an emerging ICT solution. Such services

allow even low-income people to manage small payments from their mobile phone without requiring a bank account. Programmes like Changamka in Kenya provide patients with pre-paid "smart cards" coded to approve them to receive specific kinds of healthcare at designated health facilities, and can be topped up by M-PESA or at physical terminals. The opportunities for personal finance to strengthen health systems are numerous since both require

components like user IDs, identity authentication and security measures. By enabling patients to set aside funds for health specifically, and make more direct payments, efficient delivery of health services becomes quicker and more cost-effective.

Table 1 summarizes the opportunities for ICT interventions to address the major challenge areas listed above. Yet it also indicates that such interventions cannot be realized without adequate infrastructure and committed leadership.

Table 1 Summary of opportunities and challenges for ICT to improve health systems

Health Sector Challenge	ICT Opportunity	ICT Challenge
Insufficient skilled healthcare workers	eLearning and telemedicine solutions can extend expertise to remote areas and provide otherwise inaccessible care.	Facility set-up and maintenance costs and efforts; sufficient will for providers to participate (liability concerns).
Lack of health information systems	Data collection and surveillance mHealth applications can monitor and track health indicators in real time, providing insight to policymakers on true challenges and providing valuable data enabling health workers to better serve and patients to be more proactive in their own health.	Requires widespread mobile connectivity and sufficient access to phone hardware, but not always the case.
Shortage of drugs, equipment and supplies	Supply Chain Management mHealth applications can decrease stock-out frequency and increase efficacy of and trust in health system.	To realize full potential, ICT solutions still rely on physical transport of goods and services. If entire system poorly organized, digitizing system likely will not help.
Inadequate public information about preventable diseases	Public health promotion applications can be used to disseminate empowering information in friendly, personal manner. Engaging without being intrusive.	To be successful, ICT solution still relies on end user to take action on information, and assumes health system is prepared to handle increased patient load.
Financing constraints	Health financing and personal insurance programmes offer increased opportunities for savings, both for patients and healthcare providers.	Participation in mobile savings programmes still requires commitment from users. Also, governments still are challenged to commit more significantly to health systems.

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CASE STUDIES

Several countries, including Ethiopia and Mali, have made notable advances in utilizing ICT to increase health-care access and quality of service to their populations. Ethiopia and Mali were analysed as case study countries

within the framework outlined above to identify their micro and macro challenges, and to investigate key eHealth interventions that have gained traction within each country.

Box 1

Lessons from Ethiopia

Ethiopia's health sector challenges range from the macro-level concerns of funding, human capital, infrastructure and cultural norms to specific health-sector challenges such as equipment and supply shortages, insufficient quantity of skilled healthcare workers, and a relatively uneducated population. Over the past six years, the Ethiopian government has rolled out significant national telecommunications infrastructure. This has enabled the Federal Ministry of Health (FMOH) to use ICT to improve data exchange within hospitals and to support the national cadre of Health Extension Workers (HEWs) in remote areas.

Integrate efforts and look for synergies

The FMOH began the process of integrating all ICT solutions in the health sector by commissioning a strategic framework for delivering eHealth and mHealth interventions to the population. Though they have yet to implement the strategy, discussions from within FMOH indicated that all stakeholders value the increased efficiency and expanded

reach of services provided via ICT solutions, while expending fewer incremental resources.

One example is the application of ICT to supply chain management, specifically through the DELIVER PROJECT which began in 2003. The FMOH, USAID, and other development partners implemented the Logistics Management Information System (LMIS) in order to ensure the availability of vital health supplies. DELIVER ensured efficient delivery systems, transparent and cost-effective procurement processes and strong supply chains that worked both domestically and internationally. Two crucial projects followed DELIVER, interoperating with its system: the Improving Supply Chains for Community Case Management of Pneumonia and Other Common Diseases of Childhood (SC4CCM) project, focusing on improving supply chain management at a local level in order to improve the treatment of children under five; and the Supply Chain Management System (SCMS) focusing on procuring and distributing medicines and supplies needed for HIV/AIDS patients.

Refine underlying systemic and organizational processes

Ethiopia's FMOH also demonstrated the ability to refine the underlying systemic and organizational processes that control operations in the health system before attempting ICT interventions. This approach is exemplified by their HIS reform, during which the FMOH and all partners undertook a painstaking reorganization of the paper data collection system before introducing electronic capture and transmission of data. Through this process, Ethiopia recognized that even advanced technology overlaying faulty processes is unlikely to deliver improvements in health system functioning or service delivery.

In applying ICT to solve health systems problems, Ethiopia has been most effective at national-level initiatives, such supporting the Health Extension Programme (HEP), through which all HEWs are employed, with ICT tools, and building private-sector participation with the ICT sector, such as

allowing France Telecom to manage Ethio Telecom.

HEWs and ICT in Ethiopia: opportunities and challenges

Opportunities

- Utilize telemedicine to connect HEWs to the appropriate health personnel in order to receive assistance in diagnosing and referring patients.
- Leverage ICTs to allow for the continued training of HEWs while they are still in the field.
- Use mobile applications to efficiently collect patient data and keep longitudinal records.

Challenges

- Large volume of HEWs to train and provide phones for (30,000).
- Language barriers in written information.
- Technology limitations on the quantity of information that can be delivered.

Box 2

Lessons from Mali

Mali provides an example of a low-income country with extraordinary health challenges that has acknowledged the value of ICT and is attempting to expand its technological capacity on a limited healthcare budget. Mali has recently adopted many of the recommended short-term interventions in the fields of telemedicine, distance learning, remote data collection and healthcare worker communication.

Use ICT to realize efficiency and combat waste

Telemedicine is being used to overcome the lack of trained healthcare workers and specialists in rural areas, specifically the IKON Tele-radiology programme, and digital distance learning tools are being used to improve healthcare worker training and efficacy, such as the RAFT network, CATEL and Keneya Blown. Further, open-source digital medical record systems are being used to develop e-administration systems, further improving efficiency and combating waste. The upcoming Flotte de Mobile programme will further improve healthcare worker communication and allow for remote data collection.

Partnerships increase access to expertise, funding and ICT

The programmes in Mali result from a wide range of partnerships which increase access to expertise,

funding and ICT options. Some of these programmes, such as the adoption of an e-administration system, are government initiatives. Others, such as Pesinet, have been developed by NGOs with the approval and potential future involvement of the government, within a public-private partnership framework. The Flotte de Mobile programme is the result of such a partnership that involves the Ministry of Health, the mHealth Alliance, the Orange Foundation and the Rockefeller Foundation. Similarly, IKON Tele-radiology and Keneya Blown grew out of partnerships between an NGO (IICD) and groups of Malian medical professionals. These programmes illustrate how the private healthcare sector can optimize local resources through coordinated efforts with government. The decentralized nature of the country also allows regional and community healthcare centres to independently experiment with interventions, creating an environment conducive to innovation and partnerships.

Growth strategy

Though it has made some promising steps toward a more comprehensive eHealth programme, Mali would benefit from adopting more appropriate ICT interventions and programmes. A mobile-assisted supply chain management system would be useful to prevent waste and stock-outs and improve management

of medications, immunizations and insecticide-treated bed nets. Given the lack of access to financial services and insurance, Malians would benefit from mobile-based savings and insurance programmes that could be used for basic and emergency health needs. ICT-based public information campaigns such as radio shows, information hot-lines and mobile-recorded messages about preventable diseases and healthy practices for expectant mothers and children could vastly improve health education and help reduce mortality rates. In the long term, Mali will need to address many of the country's systemic challenges, including improving rural connectivity, roads and healthcare infrastructure, and training capacity.

Mali's communication infrastructure: opportunities and challenges

Opportunities

- Communication between rural and urban areas can be further developed by strengthening tele-health programmes, the e-administration intranet, and various practitioner networks including RAFT, Kenya Blown and CATEL.
- Additionally, the use of data collection software packages such as DHIS2 and OpenClinic should better facilitate the exchange of information and data between rural and urban centres.

Challenges

- Limited internet connectivity.
- Weak infrastructure, particularly electricity in rural areas.

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RECOMMENDATIONS

The degree to which an eHealth service can be effectively established and provided is often dependent on the complexity of the system being implemented in relation to the enabling in-country environment. Yet, for many countries, eHealth interventions are generally neither systematic nor fully strategic. Typically, there is a lack of emphasis on:

1. Infrastructure and standards: creating an enabling environment,
2. Partnerships: amplifying collaboration between critical stakeholders, and
3. Interoperability: exploring effective combinations of interventions.

A strong, enabling environment includes scalable and appropriate infrastructure, transparent processes, fair legal frameworks, rules and standards for ICT component interoperability and incentivizing policies. The success of interventions could be accelerated through stakeholder collaboration involving end-users, government (cross-sector), civil society (including donors), private sector (industry) and researchers, and a well-designed mix of ICT interventions could help a country create synergies and avoid redundancies. The resulting product would improve resource allocation, reduce delays to care, improve continuity of care, improve health worker skills and make ICT useful to health workers as a tool for overcoming the challenges discussed earlier.

Recommendations for policy makers, regulators, administrators and project managers

The recommendations listed below will help those who participate in and influence the delivery of ICT-based health solutions in Africa to:

- Design appropriate and sustainable ICT solutions for health systems strengthening efforts.
- Implement interventions that produce measurable results.
- Evaluate the impact and cost-efficiency of ICT solutions before going to scale.
- Develop fast-track options for multi-country collaborations.

RECOMMENDATION ①

Create specific and scalable architecture

A scalable architecture should be established to assure an eHealth system can expand to meet new capacity requirements, adapt to social or political changes and continue to function despite financial limitations. One useful reference model is the mHealth Alliance's Enterprise Architecture initiative (see Box 3), coordinating all stakeholders, including consumers, administrators, application developers, vendors, policy makers, regulators, civil society and funders. System rules provide boundaries that govern stakeholders' use of health systems and the platforms on which they are managed, allowing developers, in particular, to create appropriate applications. Another example of an

eHealth ecosystem becoming more common in Africa is ongoing in Sierra Leone.

With a multi-phased approach to target specific segments of the healthcare community, administrators can consider the needs, situation and infrastructure of the country to optimize intervention and cost. It is important to aim for simple, low-cost interventions before attempting more complex system-based interventions that interact with other health technology initiatives. The more ICT is a part of the healthcare worker's daily engagement, the more likely eHealth interventions will become accepted as the norm.

Box 3 next page →

RECOMMENDATION ②

Precede ICT interventions with needs assessments

Before large-scale investments in eHealth are undertaken, policy makers should commission a comprehensive needs assessment to provide an up-to-date, objective view of the health and intervention needs of the population and of health workers. An additional situational analysis can also provide an examination of the resources available

to support ICT-based interventions, including physical infrastructure, human capacity and telecommunications networks. Similarly, an infrastructure asset assessment will ensure that eHealth strategies and interventions properly leverage existing and available infrastructure, and that policy makers map evidence-based interventions.

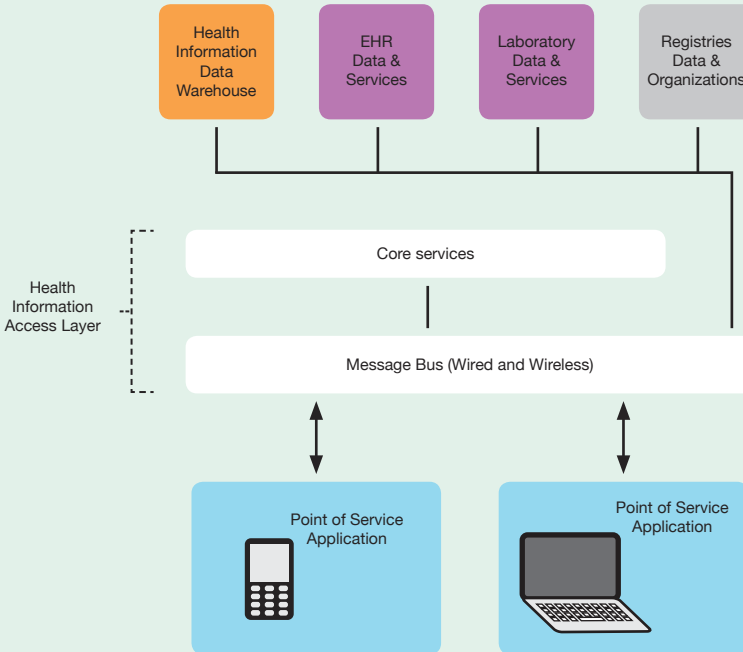
Box 3

The mHealth Alliance's Enterprise Architecture Initiative

The mHealth Alliance is working with a wide variety of organizations to create a coordinated, flexible, global collaborative team able to support leaders from developing countries in:

- Developing requirements,
- Designing systems that addresses those requirements,
- Deploying first reference models,
- Learning from mistakes and successes, and
- Continuing a process of rapid prototyping and spiral development

With its partners, the mHA is developing a draft enterprise architecture as a first reference model – initially to be deployed in South Africa – so that the various stakeholders can see the benefits of such a system and test various collections of software and services. The diagram below is a depiction of what the “info structure” might look like for a system with an Electronic Health Record (EHR), repository for laboratory data and core services, authorization/access control.



RECOMMENDATION 3

Create fora to unite decision-makers

National governments should facilitate cross-sector dialogue and cooperation by creating forums in which public and private-sector decision makers can collaboratively determine priorities and identify available assets, reducing fragmentation and accelerating the potential for scale. A well-executed forum allows diverse stakeholders to share best practices and capitalize on economies of scale, even through regional collaborations. Regional Economic Communities (RECs), supported by the African Union, World Bank, International Finance Corporation (IFC) and African Development Bank, could also play a role in bringing decision makers together.

One example of this type of forum is “Connect Africa”, a working group convened by the African Union and International Telecommunication Union, in partnership with the World Bank, governments of donor countries, and governments of participating African countries. Launched in October 2007 with USD \$55 billion pledged at that time, the initiative is designed to mobilize all resources needed to bridge ICT infrastructure gaps across Africa. In such a regional forum, economies of scale can easily be derived; for example, the success of UNICEF’s rollout of RapidSMS to improve supply chain management during the famine in Ethiopia could be replicated in similar situations in other countries, such as Somalia.

RECOMMENDATION 4

Create incentives for partnership and foster cross-sector collaboration

Development of ICT-based solutions tends to be “siloeed”, within a vertical sectors, yet the multi-faceted nature of eHealth requires the skills and resources of multiple sectors. National policy makers can facilitate multi-sector partnerships that include the private sector, universities and other research and development organizations. Public-private partnerships can encourage corporate fiscal

discipline and deep understanding of consumer needs.

Creating a cross-sector digital platform with potential use across health, financial services, agriculture, public services and education could accelerate the scaling and sustainability of ICT-based interventions by increasing economies of scale and return on investment. This is particularly important in

African countries that are small markets, where sector-specific platforms may not be viable given their relatively small user or customer base. In some

countries, mobile platforms that offer services in other sectors, such as mobile money transfer, may provide a base on which health services can be added.

RECOMMENDATION 5

Create national ID systems to facilitate impact measurements

Health records linked to uniquely identifiable individuals are a key pillar of successful eHealth strategies, because of their potential to improve continuity of care, enable point-of-service devices, and feed nationwide health information systems. The creation of unique identifiers that can form the basis of individual, digitized health records is a strong first step. These unique IDs are also extremely useful for targeting social protection systems.

Further, the lack of measurable, longitudinal data is one of the biggest barriers to eHealth investment because it prevents the ability to measure the impact of the solutions and justify the investment in these interventions. After enabling national unique ID systems, governments should take a more active role in conducting rigorous impact studies through robust monitoring and evaluation programmes, or through engaging universities and NGOs as research partners.

RECOMMENDATION 6

Conduct a total cost of ownership analysis

A common reason for the inability of eHealth interventions to scale or sustain themselves is the failure by planners to consider all of the financial costs associated with such programmes, and the comparative cost effectiveness with non-ICT solutions. Technology costs, especially hardware, often comprise an entire budget with inadequate attention

given to training, support, maintenance and operating costs. Conducting a rigorous total cost of ownership study can prevent unforeseen costs from damaging projects' chances for success, and can also force planners and partners to consider all of the elements they will need to plan for and how each of them will be funded.

Recommendations for donors

Though policy makers play the central role in setting a course for national eHealth development, many African countries remain heavily dependent on donor funds and expertise. The donor community plays a critical role in supporting and enabling sustainable and scalable eHealth solutions, and the following recommendations are aimed to help donors and other health sector investors to:

- Design a course of action to include ICT in planning discussions with policy makers when considering developmental investments.
- Designate a role for the public and private sector, keeping in mind that government is a lead user and regulator of ICTs while the private sector is primarily a lead provider.

RECOMMENDATION 7

Incentivize policy makers to follow system rules

Donors should encourage countries to adopt policies within a set of architectures that enable developers and vendors to provide the best services and applications at the most affordable prices. Donors could, for example, create or add to project checklists the desired systems characteristics

(i.e. interoperable, scalable, sustainable, multi-layered, and supported by a private-public partnership) that must be present before donors fund projects. Countries that fulfil the conditions listed on the checklists would then benefit from a fast-track status on applications.

RECOMMENDATION 8

Establish cooperation within and between donor agencies

Donors should use ICT to establish standards among themselves – regarding nomenclature, metrics and databases. They can use ICT to automatically cross-reference one another's research,

pre-empt disagreements and promote collaboration, thereby reducing overall system costs, minimizing duplication and increasing the benefit of each of their efforts. ICT systems that are built

only to support an individual donor's programmes, especially in disease-specific projects, are often cited as a major reason for the fragmentation of the eHealth landscape. Donors can do their part to improve this situation by coordinating their technology funding initiatives and seeking alignment with each other on common standards, as well as by adhering to the "rules" established by national governments.

Within their respective institutions, donors should archive and make available impact assessments for all projects, and reward projects that provide useful assessments like impact analyses and standardized return on investment calculations. Such standardization should encourage policy makers, administrators and project designers to actively and consciously integrate measurement and evaluation into their eHealth strategies.

RECOMMENDATION 9

Reward cross-sector and PPP efforts in eHealth systems development

Donors should encourage and reward countries that demonstrate a commitment to maximizing ICT for cross-sector and public-private partnership (PPP) and collaborations. Such a position among donors will encourage meaningful dialogue, interaction and collaboration between such agencies

and ministries of health, technology and education with more revenue-driving ministries such as communication and finance. Donors should make cooperation within government, and involvement of other relevant sectors, a pre-requisite for financial or technical assistance.

Further reading

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www.eTransformAfrica.org

Publications for eTransform Africa include the Summary Report, Main Report which includes an overview chapter and summary chapters of the full reports, and the full reports themselves covering the following sectors and cross-cutting themes:

Sectors themes:

- Agriculture
- Climate Change Adaptation
- Education
- Financial Services
- Modernizing Government
- Health

Cross-cutting themes:

- Regional Trade and Integration
- ICT Competitiveness

For a more detailed presentation on the role of ICT in health in Africa, see the full eTransform Africa sector report: <http://www.etransformafrica.org>.