INTEGRATED NATIONAL ICT FOR HEALTH AND DEVELOPMENT FORUM

REPORT

1,+++,+++
One Million Community Health Workers Campaign

GHANA HEALTH SERVICE

MILLENNIUM PROMISE

Desiged by Digital Eye - 0244348955

INTEGRATED NATIONAL ICT FOR HEALTH AND DEVELOPMENT FORUM

Conference Report

August, 2016

1,+++,+++
One Million Community
Health Workers Campaign

MILLENNIUM
PROMISE

REPORT OF

INTEGRATED NATIONAL ICT

FOR

HEALTH AND DEVELOPMENT FORUM

Table of Contents

Table of Contents 1

Acronyms 4

Acknowledgments 5

Executive summary 0

1.0 INTRODUCTION 1

Purpose 2

Key Objectives 2

2.0 BRAINSTORMING SESSION ON ICTs FOR HEALTH 0

2.1 Opening 0

Welcome address 0

Opening remarks 0

Participants' Expectations 1

2.2 Presentations 2

2.1.1 Policy Environment for ICTs in Health 2

2.1.3 The National Identification System 3

2.1.4 Ghana Telemedicine Project 6

2.1.4 Telemedicine and Integrated ICT System for Health 7

3.0 ICT FOR HEALTH FORUM 8

3.1 Opening Ceremony 8

Remarks by Naa Professor John S. Nabila 8

Welcome Address and Purpose of the Meeting by Dr. Gloria Quansah 9

Remarks by Prof. Jeffrey Sachs 9

Remarks by His Majesty King Dr. Odaifio Welentsi III, Paramount Chief of Nungua Traditional Area – Special Guest of Honor 11

3.2 Setting the Stage 11

3.2.1 GHS' Progress towards an Integrated Health ICT System 11

3.2.2 India's ICT Experience 12

3.2.3 Adolescent Health Mobile Apps 14

1. Ghana Health Service's (GHS) Adolescent Health App (ADH-MApp) 14

2. YMK (You Must Know) Mobile Application for Young People 16

3.2.4 Chronic Disease Management and Universal IDs for Ehealth 16

3.2.5 CommCare Presentation 17

Panel Discussion on ICT and Health 19

Chaired by Dr. Patrick Aboagye, Director, Family Health Division, GHS 19

NITA's Work in Ghana by Mrs. Veronica Boateng 19

IPMC's Experience on PPP in Ghana – Roy and Ferdinand Hiagbe 19

3.3.2 Geographic Information Systems (GIS) & Public Health 21

3.3.4 Integrated Health ID System for Cocoa Farmers 23

3.3.5 Clinic-Based ICT Systems 24

3.3.6 E-Governance Initiatives and Implications for Health 25

ICT HEALTH FORUM, DAY 2- 29TH JUNE, 2016 29

GROUP A: FACILITY-BASED SYSTEMS 29

National IT Agency (NITA) 30

Basic eHealth Infrastructure 31

GROUP B: ARCHITECURE AND SYSTEMS 31

GROUP C: POLICY AND REGULATION 35

GROUP D: COMMUNITY BASED, GIS, REMOTE SENSING, MOBILE APPS 35

4.0 CLOSING AND NEXT STEPS 39

Closing Remarks by Dr. Ebenezer Appiah-Denkyira, Director General, GHS 39

Conclusion 39

Next Steps 39

APPENDIX 41

Annex 1: Agenda for National Forum 41

Annex 2: Participants for ICT Brainstorming Session – 27th June, 2016 48

Annex 3: Participants for ICT Forum Day 1- 28th June, 2016 52

Annex 4: Participants for ICT Forum Day 1- 29th June, 2016 56

Acronyms

1mCHW	One Million Community Health Workers
CHPS	Community Health Planning and Services
CHW	Community Health Worker
EMR	Electronic Medical Records
GHS	Ghana Health Service
GPS	Global Positioning System
GIS	Geographical Information Systems
HIMS	Health Information Management and Systems
ICT	Information Communication Technology
ISSER	Institute of Statistical Social and Economic Research
MOH	Ministry of Health
MDGs	Millennium Development Goals
MCSP	Maternal and Child Survival Program
NIA	National Identification Authority
NITA	National Information Technology Agency
NIS	National Identification System
NHIA	National Health Insurance Authority
NHIS	National Health Insurance Scheme
PPME	Policy Planning Monitoring and Evaluation
PIN	Personal Identification Number
RPD	Real Presence Desktop
SDGs	Sustainable Development Goals
SADA	Savana Accelerated Development Authority

Acknowledgments

We wish to express our profound gratitude to partners, presenters and participants of the Integrated ICTs for Health Forum. We specially want to thank members of the Planning Committee, chaired and co-chaired by Dr. Afisah Zakariah, Chief Director, Ministry of Health and Dr. Samuel Kaba, Director of Clinical Care Division, Ghana Health Service respectively. Additional thanks to the Institute of Statistical Social and Economic Research (ISSER) of University of Ghana for collaborating for the public speech by Prof. Jeffrey Sachs.

We deeply acknowledge the immense contribution of our global partners from Columbia University, Mount Sinai and Dr. Sam Pitroda of India.

Executive summary

The One Million Community Health Workers (1mCHW) Campaign in collaboration with the Ministry of Health (MoH) and Ghana Health Service (GHS) convened a National Forum on Information and Communication Technologies (ICTs) for Health and Development from 27-29 June, 2016 in Accra, Ghana. The event, held at the Institute of Statistical, Social and Economic Research (ISSER) of the University of Ghana, brought together over one hundred ICT and sustainable development experts from Ghana, USA and India to share experiences and explore ways of converging and scaling up ICTs in the health system, with unified identification system and health sector enterprise architecture as entry points for an ecosystem of functionalities and modular additions to help achieve Universal Health Coverage and to contribute to the other Sustainable Development Goals (SDGs).

The ICTs for Health forum reviewed all current proposals on integrating mhealth and other information technology for unique identification in Ghana's health sector. Besides the development of a national identification system, several other facets of Ghana's existing ICT and healthcare infrastructure were reviewed. One such is the Ghanaian emergency care system for improving ambulance services and real time vital signs and vital events monitoring of patients. Issues discussed included public-private partnerships, collaboration with health care personnel and civil society organisations, and the requirements of an overarching unified government mandate, on-going governance and management.

One of the key resolutions of the National ICT for Health and Development Forum was the formation of an "ICT for Health Working Group" that will crystalize the forum's recommendations into a costed roadmap and then continue to advocate for building and deploying a seamless integrated national-scale ICT platform for unique health IDs in Ghana. The membership of the group reflects the diversity of actors that participated in the forum as well as the comprehensive mix of stakeholders required for strong, integrated ICT systems for health.

1.0 INTRODUCTION

Ghana is an innovator in health systems, with the early deployment of Community-based Health Planning and Services (CHPS), National Health Insurance, national-scale Community Health Workers, and telemedicine. In view of the advances in Information and Communications Technologies (ICTs) for health, Ghana can become one of the first few countries in the world to implement a comprehensive, state-of-the-art ICT platform for health and create unique ID numbers for all patients in Ghana as a sustainable means for achieving the Sustainable Development Goals (SDGs). Following the adoption of the SDGs, ICT has become a forefront solution in achieving the health and development goals.

The National ICTs for Health and Development forum offered the opportunity to share experiences on advancements in eHealth and brainstorm key actions to address gaps and explore opportunities for partnerships. A key deliverable of the forum was the development of a roadmap for developing unique ID numbers for health care seekers in Ghana. The roadmap unified stakeholders' efforts around common actionable items with specific timelines and funding sources.

Purpose

The aim of the forum was to bring together key stakeholders in ICT and Sustainable Development to brainstorm on how Ghana might pioneer the development of unique ID numbers for patients by leveraging the existing ICT system in the country. The forum reviewed Ghana's eHealth systems and strategies, identified existing gaps that require early attention and developed a strategic technical and resource pathway to build and deploy a seamless integrated national-scale ICT platform for health.

Key Objectives

The specific objectives were:

1. Share knowledge and experience, on convergence of ICTs in health towards the SDGs;
2. Build momentum to promote evidence-informed policy decisions on ICTs for universal health coverage;

3. Promote cross-sector partnerships (between government, research, academia, private sector businesses and civil society organizations) for the acceleration of deployment of ICTs in health at various levels;
4. Provide capacity building opportunities for policymakers and stakeholders for deployment of contextually-relevant mechanisms in support of integrated ICTs for health and;
5. Consider ways that the national ICT platforms (e.g. for Unique ID, payments, e-governance, and other areas) can support e-health.

2.0 BRAINSTORMING SESSION ON ICTs FOR HEALTH

The integrated ICT for health forum commenced on 27 June, 2016 and attracted key stakeholders from Ghana's ICT and eHealth sectors, and provided a platform for organizations to share their current work in ICT and past attempts at creating unique identifications. The session was attended by representatives of the Ministry of Health, Ghana Health Service, National Identification Authority, IPMC and other stakeholders.

2.1 Opening

Welcome address

Dr. Afisah Zakariah, Chief Director of the Ministry of Health welcomed stakeholders to the ICT Brainstorming session. She applauded the commitment by the stakeholders to leverage ICT system for improving health services and accelerate the achievement of the Sustainable Development Goals (SDGs). The increased use of mobile phones, computers and other ICT accessories should be considered a golden resource to move the development agenda. Dr. Afisah shared some of Ghana's successes in the use of ICT for improved health system. These included innovative, home-grown Community-based Health Planning and Services (CHPS) Strategy, the National Health Insurance Scheme, the national-scale deployment of Community Health Workers, and telemedicine innovations. The Chief Director was very optimistic that the ICT platforms present could serve as a good vehicle for achieving the SDGs. Stakeholders were admonished to collaborate around brainstorming key actions to address gaps and explore opportunities for partnerships towards greater integration and scale-up of eHealth innovations.

Opening remarks

Professor Jeffrey D. Sachs in his address highlighted the Sustainable Development Goals (SDGs). Universal health coverage, as captured in the SDG 3, remains a big challenge to most pasts of the world. The goal, which requires that health services are accessible to all and at all times, can be achieved if health facilities are equipped with the right personnel and technology to address catastrophic health conditions, especially non communicable diseases. Leveraging ICTs for health can offer many benefits including:

1. Electronic medical care
2. Easy access to online training materials for mentoring and formal counselling
3. Use of mobile technology for outreach services

4. Ability to identify signals of epidemics, challenges of meeting patient's needs for analysis
5. Adopt appropriate governance for the health sector where the flow of information between the health system and patients is easy
6. Address issues of payments, finance, logistics and medicines
7. Access to real-time and reliable data on birth and deaths which is critical for:
    - Utilizing ICT for emergency transport services
    - Integrating GPS and smartphones with the health sector such as adopted for the Ghana CHW programme
    - Use of ICT for patients monitoring (e.g. blood pressure)
    - Use of ICT for households contact by CHWs, nurses, doctors, and other healthcare personnel for emergency calls
    - Ability to have unique IDs

Participants' Expectations

Chief Nat Nsarko, Country Director of 1mCHW Campaign facilitated the session on participants' expectations. They included the following:

- A clear roadmap for implementing a common IDs for patients
- To be exposed to the opportunities and systems being harnessed for creating unique ID
- Identify policies governing the use of ICTs
- Learn best practices from other countries
- How patients can be monitored using improved technology especially in emergencies
- What national eHealth strategies are currently available
- What are the implementation timelines
- What is going to be the appropriate passion and desires for implementation
- How to translate policy into action – when and how and who is going to do it?
- How ICT will close existing infrastructural gaps
- How to leverage ICTs to review the NHIS
- How integrated ICTs / health IDs would improve ambulance services
- How we can sustain the integrated ICTs
- How ICTs would be used to support day to day running of healthcare business
- How resources would be mobilized (where would be the funding sources, how, when and by who?)

- Ghana public health issues: What is the national strategy of eHealth focusing on primary health care
- Interoperability and how best to protect patients' data. How do we get IT professionals on board and how best to use the infrastructure
- Mobile telephony coverage challenges and how are we going to fix it
- Appropriate passion and desire to translate policies into action
- ICT to solve human resource gaps in the health system
- How do we contextualize ICT in our setting especially in the remote rural areas where the services are mostly needed, and how do we sustain it.
- Resource mobilization to achieve the results
- Network systems management
- Support to ICT companies to do their job easily
- Develop a common ID to link patients' information to facilitate continuum of care
- All key stakeholders to speak a common language
- How ICT can be used to improve the capacity of health providers
- ICT for health to improve quality health service in the rural areas
- Insight to strengthen the primary health care in rural areas
- Identify possible collaboration
- Software information and literation easily under
- Various policy issues regarding ICT in Ghana

2.2 Presentations

2.1.1 Policy Environment for ICTs in Health

Presentation by Dr. Emmanuel Ankrah Odame, Director of Policy, Planning, Monitoring and Evaluation (PPME), Ministry of Health

Ghana's directive principles of state policy as stated in article 34(3) enjoins the state to provide just and reasonable access by all citizens to public facilities and services of which the Health Service is a critical component. Article 35(6)(d) discusses the need to address rural and urban disparities and ensure equity are in line with the SDG3 - to ensure healthy lives and promote well-being for all at all ages. The SDGs are in sync with the national health policy to ensure healthy, productive and increased life expectancy. The policies are also to support efforts in reducing excessive risks and burden of morbidity, mortality and disability, especially among the poor and marginalized in society through the reduction of inequalities in access to health, reproduction and nutrition services.

Ghana's eHealth Strategy

In June 2009, Ghana drew inspiration from the United Nations Economic and Social Council meeting held in Accra to build its own eHealth strategy. The strategy acknowledges two key components of eHealth: infrastructure and solutions. Other requirements for an ICT infrastructure include computing equipment, networking devices, multimedia systems, mobile telephony and communication, imaging devices and internet systems. The key Strategies in Ghana's eHealth policy were outlined as follows:

Strategy 1. Streamline the regulatory framework for health data and information management

Strategy 2. Build sector capacity for wider application of eHealth solutions in the health sector

Strategy 3. Increase access and bridge equity gap in the health sector through the use of Information and Communication Technology

Strategy 4. Towards a paperless records and reporting system

To effectively implement these strategies it is important to clearly define the issues under consideration and select the best options available for addressing them. Policies have to be aptly interpreted, implemented and regularly monitored and periodically evaluated. Dr. Odame cautioned implementers about the political and cultural dimensions of implementation. While political leaders at various levels will seek to use their power to influence outcomes, implementers must consider different cultural settings and how policy will be adequately integrated into them. In order to effectively implement any eHealth system, there is the need to conduct a study tour on countries with experience in implementing eHealth strategies, evaluate the previous strategy and formulate a revised strategy.

The design of an ICT health system for Ghana must take cognisance of disaggregation of data by age, sex, wealth, location, disability status, and other dimensions of inequality. Such systems must be capable of real-time monitoring systems such as household surveys, people-led feedback initiatives; perception data through the use of big data analytic tools. Existing data collection mechanisms may not be sufficient for all the data needs and will need to be supplemented through other innovative forms of data collection.

2.1.3 The National Identification System

Presentation by Mr. Reuben Tetteh, Head of Technology and Biometric, National Identification Authority (NIA)

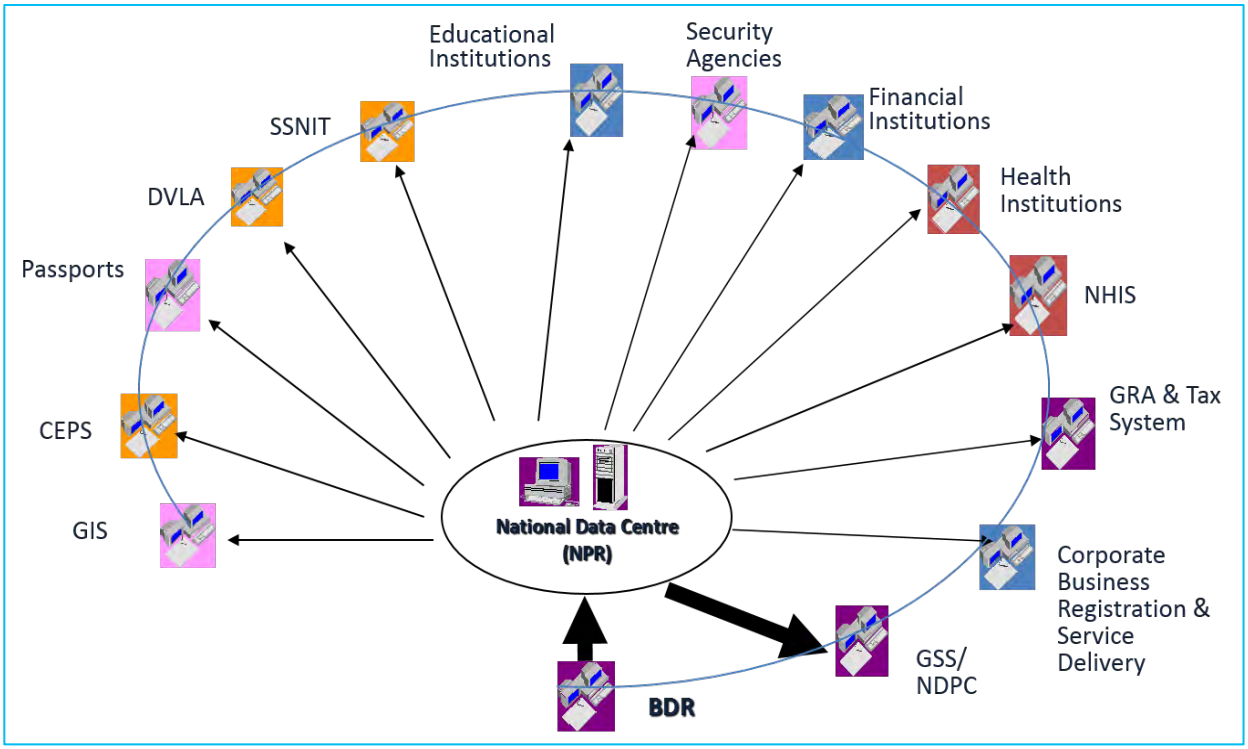
The National Identification Authority (initially called the National Identification Secretariat) was established by Act, 2006 (Act 707) as the body mandated to implement national identification system in Ghana. Its core mandate is to provide a multipurpose single ID card that contains comprehensive data on personal identification, electronic signature and access to government services, national health insurance, driver's license, passport and other information deemed necessary. This was to serve as a mandatory document required to access services in public and private sectors based on the unified centralized national database with a PIN as the unique identifier and key link through all service delivery systems. The organization draws its legal and operational framework from the:

- National Identification Authority Act, 2006 (Act 707)
- National Identity Register Act, 2008 (Act 750)
- National Identity Register Regulations 2012 (L. I. 2111)

The National Identification Authority (NIA) seeks to help address key national concerns with the creation of a national identification system infrastructure based on a centralised and integrated national population / identity register that facilitates the integration, coordination, and access public and private sector services to the population. This is done based on an efficient ID-based service delivery system to provide a secure and trusted platform for identity verification/authentication. The Authority is to facilitate better national planning and allocation of resources based on real-time data from the NIS and provide a platform for e-government and e-commerce services.

To be able to undertake their assignments successfully the NIA is mandated to set up a National Data Centre, establish a centralized and integrated national population register, create, operate and manage a national identification system (NIS), and undertake mass and continuous registration. The NIA can also develop policies and structures to safeguard the system's integrity - data access and security regulations while promoting the use of the Ghanacard to facilitate linkages of the NIS to various public sector agencies to support civil operations, law enforcement, corporate and business systems.

The NIA has a vision of becoming the 'one-stop' point of reference for reliable and secure identity management in Ghana. Its mission is to adopt a cutting-edge technology to provide client-based identification services for socio-economic development, good governance, safety and security for all citizens and legal residents.



Service Linkages to the National Identification System

Since the inception of its operations the NIA has registered 16million people across the ten regions of Ghana. Data for 9,120,476 have been loaded out of which 4,565,689 have been fully processed for issuance of cards. However, 2, 15,000 cards have been printed with 1.2 million distributed.

In a meeting with ECOWAS Ministers of Interior and Head of Immigration and Consular Affairs on Biometric ID and Registration of Citizens (2014/2015), it was agreed that National IDs should be considered as national security priority. It was recommended that national ID cards should have specified requirements for member states with common security features to provide a cross-border e-verification/authentication service. This was also to enable community citizens to use their national e-IDs to access e-government and other e-services across national borders.

In response to specific inquiries into needs of NIA to ensure successful implementation of its programmes, Mr. Reuben Tetteh indicated that a proposal for achieving the unique ID system has been submitted to the parliament of Ghana for consideration. The greatest anticipated challenge is integrating existing frameworks onto a common platform. A committee needs to be set up to streamline the current disintegrated architectural designs. With reference to the adopted technology, the NIA is understudying Kenya, India and other

countries to implement a more robust ID system. The major challenge facing the NIA is the availability of funds to implement the national ID system.

2.1.4 Ghana Telemedicine Project

Presentation by Mr. Joseph Nana Adomako, National Telemedicine Programme Manager, Ghana Health Service

Adopted from the Ghana Millennium Villages Project in Bonsaso in the Ashanti Region of Ghana, telemedicine will be scaled up nationally to improve timely and targeted health care delivery as well as reduce preventable deaths especially in deprived communities. Specifically, telemedicine will address challenges of inadequate health facilities with limited capacities; inadequate and mal-distribution of highly skilled health professionals; poor and undeveloped infrastructure especially roads; development programmes concentrated in urban areas and; high morbidity and mortality. The eHealth innovation will provide quality primary health services that are affordable and sustainable to meet the needs of people through the adaptation of information technologies. With ICT, telemedicine will ensure that everyone has access to healthcare at all times. The design of the national model in Ghana is one that allows health workers at the periphery to dial into a teleconsultation center, equipped with health experts, to seek expert advice on how to effectively manage a patient.

Experience from MVP's Center of Excellence revealed that telemedicine greatly, Improved capacity of periphery staff, Reduced Staff isolation, improved better and appropriate stabilization of patient, and Enhanced appropriate and adequate pre-referral treatment. There were also improved referral system which fostered deep insight into critical management and administrative issues including funding and also provided avenue for better understanding of the human resource requirement. The MVP pilot revealed an average of 420 calls each year covering a wide array of medical issues. In 2013, 54% of all cases were resolved by phone, including 31% avoided referrals. Telemedicine is currently operating in 4 regions of Ghana: Ashanti, Central, Volta and Upper East Regions. The rollout to 2 additional regions, Eastern and Greater Accra, is near completion. A national coverage is expected by 2017.

2.1.4 Telemedicine and Integrated ICT System for Health

Presentation by Sanford Health Enterprise

Sanford Health Enterprise is the largest non-profit rural health care organization in the U.S. Inspired to support Ghana's overly stretched health system. Sandford was established in Ghana in 2012 and works with over 300 health professionals. In collaboration with the Ministry of Health and Ghana Health Service, Sanford operates through at least 360 clinics in Ghana offering a wide range of services including integrated primary health care, specialty hospital care and education.

Sanford operates two categories of Telemedicine Technologies in Ghana. The first is the Real-Time (synchronous) system which involves video conferencing equipment, phone or home visit where patient & provider are in same location and the specialist at a distance. Consultation about symptoms are taken followed by assessment similar to face-to-face appointment. The second system is known as the Store and Forward (Asynchronous) where medical practitioner and patient don't need to meet in person. Diagnostics images or videos are transferred from one site to another for viewing offline. Diagnosis relies on historical reports or images rather than physical examination.

Sanford's Integrated ICT for Health uses EMR (Electronic Medical Records) in creating a paperless system with efficient and easy accessibility to patient records across sites. Telemedicine is used to bridge the equitable gap in access to medical expertise regardless of the geographical location of the patient. Current Components of the Software requires dedicated internet band width, Real Presence Desktop (RPD) software, audio-video call system capable of 2-way interaction, a peripheral exam camera, and Transmitting Stethoscope software. A number of challenges facing the telemedicine initiative in Ghana include limited availability of wideband internet, unstable electricity in rural areas, diversity in languages, inadequate medical facilities in rural areas and lack of National Policy on Telemedicine in Ghana. Despite the aforementioned challenges, Sanford believes that opportunities exist to utilize telemedicine for increased range of care and education. Again, telemedicine can pivot the achievement of SDG 3 in Ghana.

3.0 ICT FOR HEALTH FORUM

Following the ICT brainstorming session on day 1, 27th June, ICT experts were joined by other stakeholders for a forum on 28th and 29th June 2016. Present at the official opening of the forum were:

1. Naa Professor John S. Nabila, President of Ghana's House of Chiefs
2. Professor Jeffrey Sachs, Director of Eart Institute, Columbia University and Advisor to the UN Secretary General
3. Dr. Gloria Quansah, Deputy Director General, Ghana Health Service
4. Professor Prabjot Singh, Mount Sinai, New York
5. Dr. Alexis Nang-Beifubah, Regional Director of Health Services, Ashanti Region, GHS
6. His Majesty King Dr. Odaifio Welentsi III, Paramount Chief of Nungua Traditional Area

3.1 Opening Ceremony

Remarks by Naa Professor John S. Nabila

Naa Professor John S. Nabila, President of the Ghana House of Chiefs and Chairman for the opening ceremony of the Integrated ICT Forum in his remarks indicated that ICT has become a mainstay in the world. He stressed that, *"the idea of scaling and integrating various components of Information and Communication Technologies (ICTs) with the objective of improving upon health lies at the core of development."* He adds that Ghana needs integrated ICT systems for improved health and development. When adequately explored, the forum outcome would

support the realization of Ghana's long-term development plan. Stakeholders were charged to develop innovative approaches and means of implementation that will positively affect the ordinary Ghanaian.

Welcome Address and Purpose of the Meeting by Dr. Gloria Quansah

Dr. Quansah indicated that the ICT forum will explore options for integrating the various ICT for Health initiatives in the country. It will also explore the development of unique ID systems for health and development. Again, the forum will help identify priority actions, potential collaborators, and funding sources for implementing the agreed roadmap. To expedite the integration process, an ICT for Health Advocacy Group will be established.

Remarks by Prof. Jeffrey Sachs

Professor Jeffrey Sachs was grateful that Ghana made some tremendous improvements in health and other aspects of the Millennium Development Goals (MDGs). He explained the significance of the Sustainable Development Goals (SDGs) for achieving socio-economic and

environmental growth. The SDGs (specifically, SDG 1), according to Prof. Sachs, can guide Ghana reduce its poverty level. SDG 3 calls on all countries to grant everyone equal access to quality health care services including improved maternal and child health, reduced communicable and non-communicable diseases.

Prof. Sachs reiterated the objective for the forum, which was to leverage ICTs for improved health. As the brain behind the MDGs and the Millennium Villages Project (MVP), Prof. Sachs cited that the MVP sites in Kumasi and the SADA zone contributed greatly to socio-economic development. His passion for primary health care delivery fueled the establishment of the One Million Community Health Workers (1mCHW) Campaign in Ghana to help strengthen Ghana's flagship programme, the Community-based Health Planning and Services (CHPS) through the deployment of Community Health Workers (CHWs).

In order to quickly scale up ICTs in Ghana, Prof Sachs advised stakeholders to brainstorm on "what is appropriate for the country." He was optimistic that the brainstorming exercise will lead to a much more constructive way of using ICT to identify trends, improve emergency transport using GPS, payment system, and patient monitoring. He stressed that *"...just like people tweet and call in to radio and TV stations, people in Ghana should not have a challenge accessing health. Even x-rays can be digitalized and transmitted via the internet. "We want to see Ghana accept this innovation rapidly and we want to see Ghana as a role model to other countries*."

Remarks by His Majesty King Dr. Odaifio Welentsi III, Paramount Chief of Nungua Traditional Area – Special Guest of Honor

His Royal Majesty, King Dr. Odaifio Welensitsi III, paramount Chief of Nungua Traditional area in the Greater Accra region of Ghana participated in the ICT forum as a special guest of honour. With ICTs for health taking center stage in the quest to improve health and wellbeing, the King registered his support when he cited that ICTs should be leveraged to reduce challenges associated with Management of health care, data capturing, accuracy, consistency and timeliness for prompt decision-making, as well as taken the increasing concern in mountaineering operational cost, reduced customer satisfaction and others. The Traditional Leader also noted that ICTs, with its tendency to provide more efficient ways of accessing, communicating, and storing information, can improve the health of individuals and communities. eHealth applications and databases can "*improve health system efficiencies and prevent medical errors.*" King Welentsi III congratulated stakeholders for spearheading the exploration of ICTs integration for improved health systems in Ghana.

> ***"ICTs help healthcare providers and technicians to concentrate on the client, increasing productivity and customer satisfaction, reducing stigma and above all reducing operational costs."***
>
> HIS MAJESTY KING DR. ODAIFIO WELENTSI III, PARAMOUNT CHIEF OF NUNGUA

3.2 Setting the Stage

3.2.1 GHS' Progress towards an Integrated Health ICT System

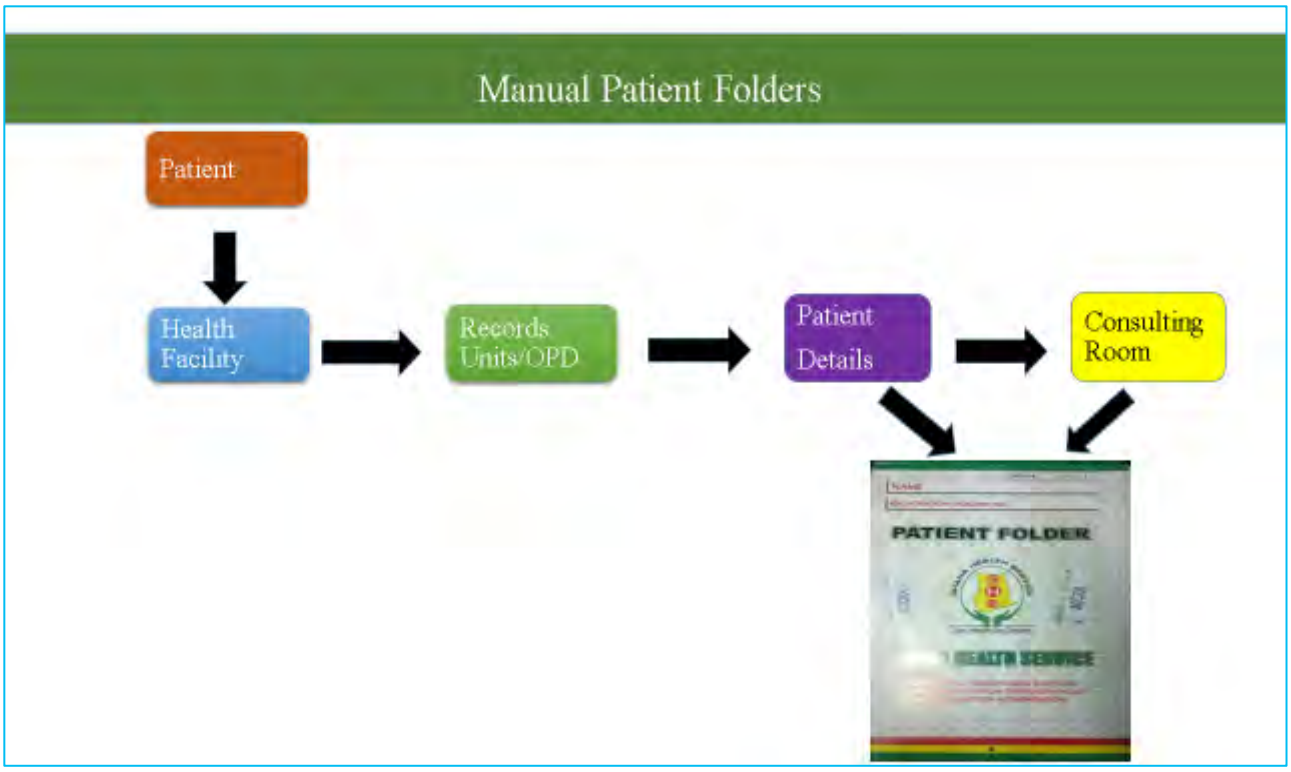
Presented by Mr. Sam Quarshie, ICT Head, GHS

In Ghana health system patient records are mostly managed manually. And although a few facilities are embracing the use of e-records, the majority of facilities are yet to appreciate the convenience of using innovation. All information are recorded into folders and stored manually. This practice has challenges of losing patient data and the need for substantial amount of physical space for storage.

Ghana's health facilities can benefit greatly from the use of e-records, which facilitates coordinated, effective and efficient healthcare delivery, increased patient safety (medical and medication errors) while ensuring privacy and security of patient data and reduced costs. The Ghana Health Service (GHS) has made several attempts at adopting eHealth for improved

health care delivery. The following packages are however needed to rollout an integrated ICT for health:

- Legal and Regulatory Frameworks
- Clinical standards and Protocols
- HIMS solutions
- NHIS electronic platforms
- ICT Infrastructure
- Integrated medical diagnostic equipment



Manual capture of patient information in health facilities in Ghana

3.2.2 India's ICT Experience

Video Conference with Dr. Satyanarayan Gangaram Pitroda (popularly known as Sam Pitroda), founding Commissioner fo the United Nations Broadband for Digital Development

Mr. Sam Pitroda is an internationally respected telecom inventor, entrepreneur, development thinker, and policy maker who has spent 50 years in information and communications technology

(ICT) and related global and national developments. He is credited with having laid the foundation for India's telecommunications and technology revolution of the 1980s and helping revolutionize India's access to technology as the key to social change. He is also the Chairman of the International Telecommunication Union's m-Powering Development Board that looks to empower developing countries with the use of mobile technology.

Dr. Pitroda highlighted on the significance of ICT for e-government, specifically in development planning, income tax and others. E-governance is gaining center stage in the development of countries and requires auto-source software, high speed connectivity and social networks. The generation of unique health IDs is key for providing quality health services. India has successfully provided unique numbers to a billion people in just a year. The ID system, called 'Aadhaar', is tapped to render other services like pension programmes and drivers' license. In addition, India has designed a GIS platform for providing internet access to all institutions including schools and hospitals to enhance development. According to Dr. Pitroda, "*Connectivity is the Key*". The big question, however, remains how to use this connectivity to redesign the world's health system and other developmental agenda while preventing duplications and unnecessary cost for a greater impact. E-governance is all about improving government interface, more about human development and focusing on the people as it is the key to creating employment and reducing poverty. Software technologies can help create a network system for changing government functions using e-governance and making services accessible to the larger population. He however stressed that most e-governance systems need to be redesigned. For example, standardizing forms and procedures is a major step. He added that social networks can make this challenge easier to overcome. Another challenge to integrating ICT is identifying and leveraging public and private partnerships. Dr. Pitroda mentioned that some major steps to achieve a greater level of broadband access in Ghana include:

- Making broadband policy universal in Ghana
- Making broadband affordable in Ghana
- Connecting homes—both urban and rural—to broadband
- Getting Ghanaians online
- Achieving gender equality in broadband access

Dr. Pitroda recommended the acquisition of cloud computing, GIS, social network, open source software, smart phones and broadband connectivity to kick start the ICT and e-governance redesign. For Africa, it is important to design an ICT standard that best suits their needs. In responding to questions, it was indicated that the cost of registering was **USD1 per person in**

India. The process of integrating the ICTs in India is ongoing but challenging since there are no short cuts.

3.2.3 Adolescent Health Mobile Apps

Presentation by Naa Odoi Angela, Family Health Division, Ghana Health Service (GHS/FHD)

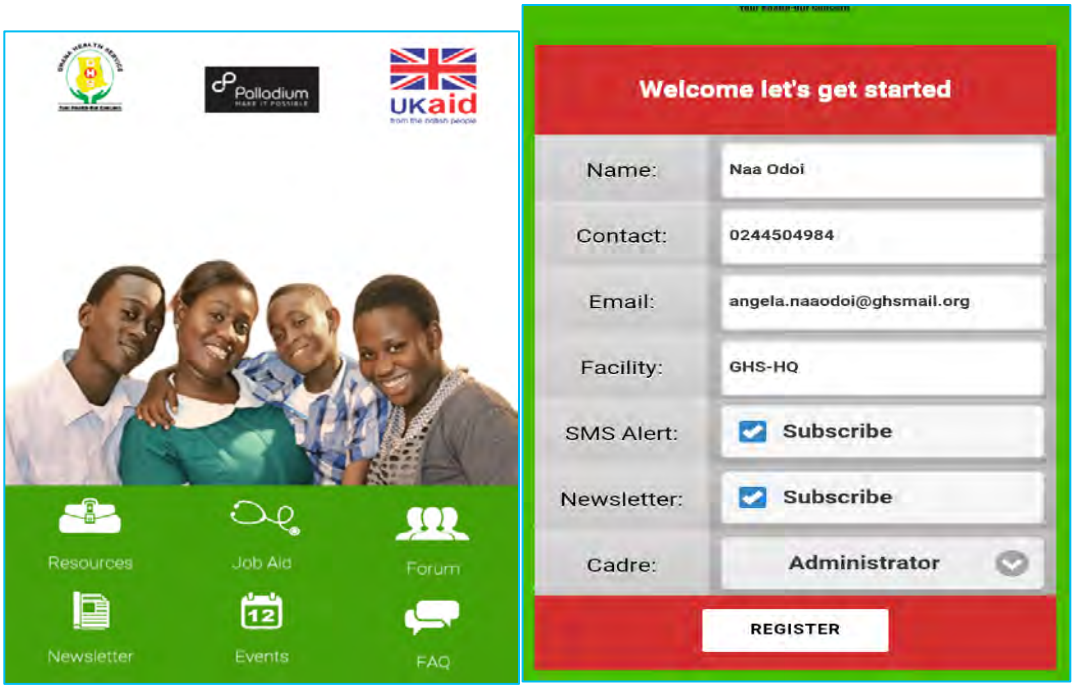
1. Ghana Health Service's (GHS) Adolescent Health App (ADH-MApp)

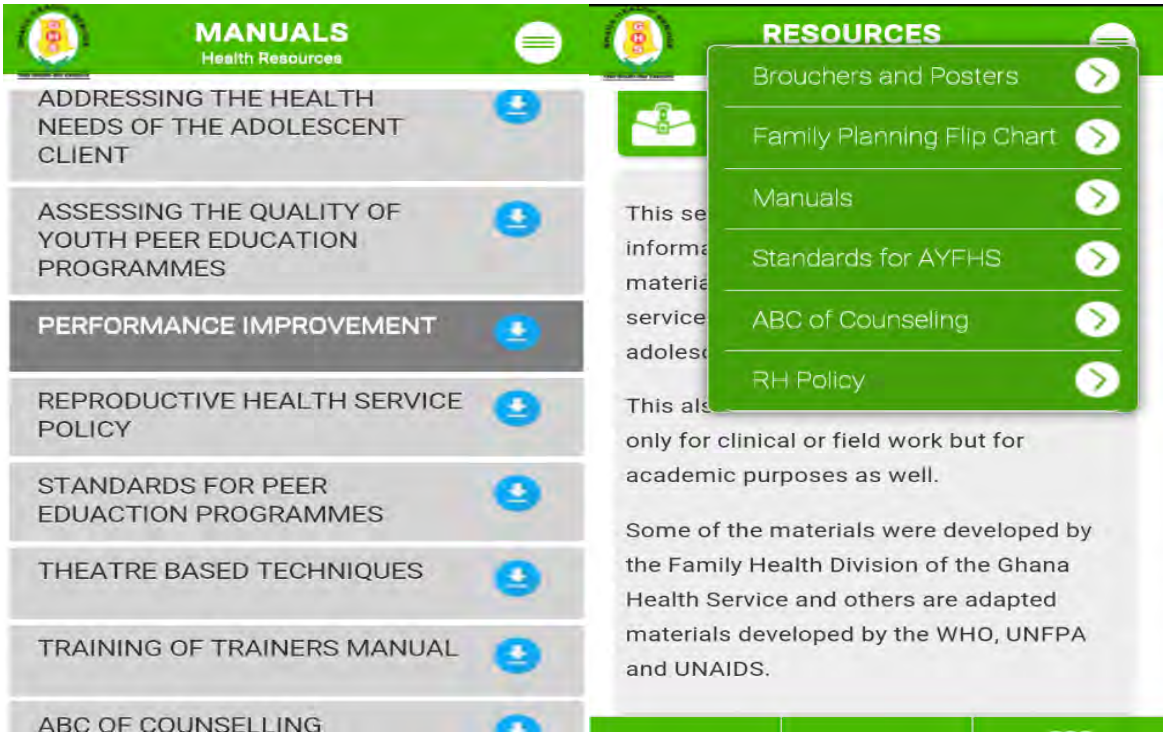
About 92% of hospitals, 85% of health centers and 81% clinics have access to at least one mobile network coverage (EmONC, 2010) – this is an opportunity for disseminating public health information. The Ghana Health Service's Adolescent Health App (ADH-MApp) mainly targets health workers responsible for providing adolescent health services. The app seeks to improve service providers' knowledge and skills in adolescent health services. The eHealth innovation will also facilitate adherence to service standards, guidelines and protocols on adolescent health service delivery.

ADH-MApp has in-built features which allows service providers the opportunity to access:

- Policy documents; e.g. *RH Policy, ARH Policy*, etc
- Service Standards and Protocols; ADH Training Manual and *Job Aid 2016, FP protocol, SM protocols etc*
- Information, Education and Communication materials *(16 ADH related topic)*

The mobile app currently runs on Android. Architects are hopeful that the phones will soon run on windows and IOS platforms.





Interfaces of the ADH-MApp

2. YMK (You Must Know) Mobile Application for Young People

YMK is a mobile app that provides access to health resource materials for young people. It is aimed at widening access to health information and services among adolescents and young people between the ages of 10-24 years, as well as quip parents, teachers, guardians to properly support the health needs of their wards. YMK is designed to address high teenage pregnancy rate, low patronage of health services among adolescents and challenges in the provision health services in schools. Since its inception, YMK has greatly improved access to health information and utilization by adolescents. With this app, health messages/updates are sent to users on regular basis. YMK was designed to complement GHS resources such as GHS/ADH website, GHS-ADH-mAPP, publications and documents.

Interfaces of the YMK app

3.2.4 Chronic Disease Management and Universal IDs for Ehealth

Presentation by Prof. Prabjhot Singh, Mount Sinai

The presentation focused on how eHealth and universal IDs can contribute to managing non communicable/chronic diseases like stroke, heart disease and diabetes. The upsurge of chronic

diseases in developing countries is becoming a matter of worry to many. For example, in Ghana, chronic conditions are among the top 10 killer diseases and stroke is the 2nd leading cause of deaths and all.

Representing an institution which is the largest medical training center in the USA, Mount Sinai, Prof. Singh stressed on the need to establish a common eHealth architecture to drive adequate health service delivery.

His presentation revealed 3 main levels for managing health care conditions.

1. The use of hospitalized facilities,
2. Outreach, and
3. Individuals managing their conditions at home and walk in to see health providers when they have to.

In as much as many eHealth platforms are leveraged to improve health service delivery to patients, the use of different applications in health care has a greater tendency to burden and confuse people about their health. For this reason, it is important for each country to consider eHealth platforms with the following as guide:

- Building a common care model: The world needs an organization of health care and community resources to manage conditions
- Developing a unique ID system: These IDs should be linked to systems that are necessary for their function. Thus, the first step towards creating a unique health ID is to think about why people will need an ID.
- Public-Private Partnership: A partnership between the public and private sectors is critical for implementing unique health IDs
- Involve Providers in Planning Stage: Healthcare providers, as final users of any ID system, must be adequately engaged at the design stage.

3.2.5 CommCare Presentation

By Ms. Mohini Bhavsar, Deputy Regional Director, West Africa, Dimagi

Dimagi has in the past worked with Millennium Promise (MP) to implement CommCare and hopes to extend it onto Ghana Health Service's e-tracker to improve community health. Dimagi's CommCare is a cloud-based app innovated to improve community health with its counseling and service provision tools. The organization has strived to integrate its work with existing supply chain, agriculture and other sectors. Dimiagi is also working closely with

Millennium Villages Project (MVP) and the National Information Technology Agency (NITA) so that CommCare data is hosted in the county. The app is expected to support various platforms including android.

Dimagi has over 300 projects across 50 countries in the world. In Ghana alone, the organization supports 21 projects. The supply chain system uses Dimagi's platform to manage ART. Dimagi seeks to work with Ghana's health system to strengthen facilities at the community level through Ghana's Community-based Health Planning and Services (CHPS). This approach was adopted in Liberia and Sierra Leone to manage the Ebola outbreak. The biggest take away for Dimagi from the ICT conference is determining how CommCare can be integrated in the unique health ID creation.

Panel Discussion on ICT and Health

Chaired by Dr. Patrick Aboagye, Director, Family Health Division, GHS

The Chairman for the first panel session, Dr. Patrick Aboagye, stressed on the need to develop a unique health ID in Ghana. He encouraged participants to support in designing the ID system so that the needs and challenges of all stakeholders can be addressed.

NITA's Work in Ghana by Mrs. Veronica Boateng

NITA was established in 2008 to work closely with the Ministry of Communications (MoC) to ensure that leadership and guidance is established for e-governance in Ghana. In creating unique IDs, the organization seeks to do this in close collaboration with the National Identification Authority (NIA). NIA is currently the only government institution with the mandate to issue IDs. Thus, the creation of a health ID must therefore feed into NIA's system. Mrs. Boateng applauded the creation of an integrated ID saying "*…the country currently is in a desperate need for an integrated ID card*" which should not be difficult to achieve. She suggested ways to do this:

1. Ensure governance bodies approve of it
2. Leverage ICTs systems
3. Address violation of ICTs ownership and compliance laws.

Mrs. Boateng recommended revisiting the proposed enterprise architecture framework to ensure a successful integration of ICT platforms.

IPMC's Experience on PPP in Ghana – Roy and Ferdinand Hiagbe

IPMC has worked closely with the Ministry of Communications and NITA for some time now to standardize health care delivery in Ghana. IPMC currently works with the Korle-bu Teaching Hospital, and Zebilla and Wa hospitals to implement an e-records system with Korle-bu as the referral hub. The main challenges encountered so far revolves around double registrations and lack of patients past records. IPMC has organized a number of trainings for health staff to help reduce double registrations but this has been very expensive. Erratic power supply has been a major challenge in the implementation process. This is one of the main reasons why Public-Private Partnership is required for adequate implementation.

Question and Answer Session

1. What happened to the national eHealth policy formulated in 2012?
   Ghana has translated the policy into a number of eHealth initiatives. There's currently a new proposal to revise the eHealth policy to suit the current needs of the country. It is important that stakeholders work within the policy framework.
2. What resources do we need to set up the 5 basic eHealth infrastructure proposed by Dr. Pitroda?
   NITA is piloting a health ID system in three hospitals: Zebila, Wa, and Korle-bu hospitals and hopes to learn some lessons for scale up. The Design requires that each patient is registered in one of piloting facilities. The system enrolled patients from each of the participating hospitals pending data integration of the 3 facilities. Government connectivity initiative in Southern, Northern and Eastern corridors of Ghana will adequately support the creation of unique health IDs for all health facilities in the country. Government also has the capacity to host cloud services in the country with all security policies in place to guide implementation. What is lacking is a unified health information exchange (HIE) to enable health data to be converged at a central point and redistributed to institutions that might need it. This has been challenging to implement as the health sector has not followed existing protocols in their architectural designs.
3. Electricity and Connectivity is an issue African governments have to work with. How do we work around this?
   Implementers need Gen Sets and solar panels as alternative sources of electricity to help solve the situation.
4. How do we strategize to develop the health ID and getting around what the government cannot provide?

   There is need to develop a fresh enterprise architecture per existing protocols or revise existing designs to meet current standards. Implementers of the ID system should consider the design of the National Health Insurance Authority (NHIA).

5. Why is GHS not abiding by framework?

   Although GHS was the first agency to develop enterprise architecture, it is yet to implement the framework. The major challenge for the GHS has been lack of capacity/skills to revise the existing framework. To revise and implement the current framework however, the governing body must be strengthened to make key decisions.

3.3.2 Geographic Information Systems (GIS) & Public Health

By Winfred Dotse-Gborgbortsi, Public Health Researcher & Geospatial Analyst

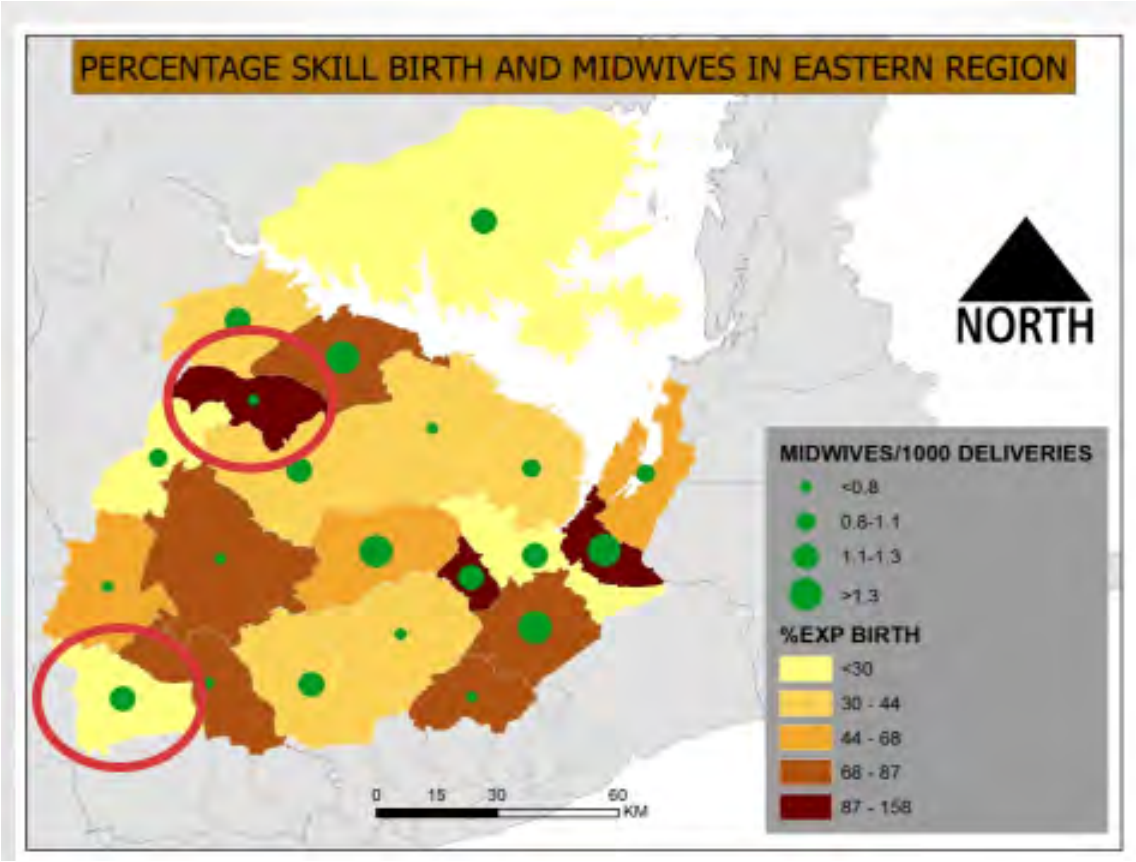
Geographical Information Systems (GIS), computer based systems for the integration and analysis of geographic data, are constantly explored for connecting people to their health as well as for changes in their physical and social environments. With GIS, the world is able to navigate, make well informed decisions and tell the stories correctly.

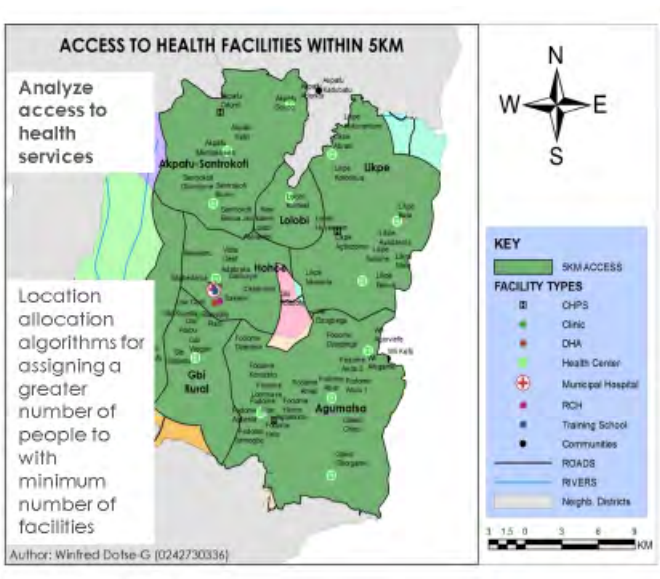
GIS has a great impact on health and can change most perceptions and actions for improved health service delivery. The science can improve health in the following ways:

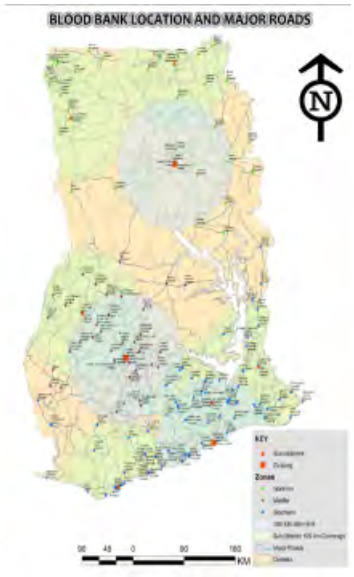
- Mapping health information
- Analyzing spatial clustering of health events
- Analyzing environmental hazards
- Analyzing the risk and spread of infectious diseases
- Analyzing access to health services

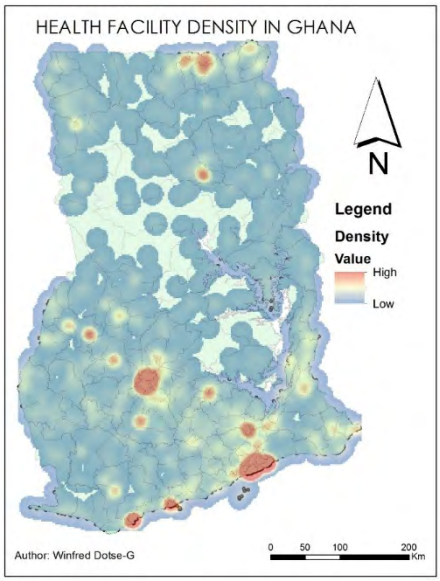
Despite the expediency in using GIS to improve health service delivery, managers, mostly in developing countries, constantly grapple with the under listed challenges:

- Availability of up-to-date data - hydrology, boundaries, transportation, health facilities, service availability and readiness assessment
- Cost of licensing some software
- Investing in capacity building
- Cooperation between various sectors - policies to encourage access to data and information (lessons from abolishing selective availability of GPS
- Low internet connectivity in some areas









Using GIS to map service availability areas

3.3.4 Integrated Health ID System for Cocoa Farmers

By Dr. Fred Bedzrah, Kuapa Kooko

Dr. Bedzrah started with a brief background of Kuapa Kokoo Farmers Union (KKFU), from its establishment in 1993 as a small-holder cocoa farmer co-operative to the current membership of over 100,564 farmers. KKFU ensures that premium earned from the sale of cocoa is invested in social protection projects such as schools and health systems. KKFU implements a community-oriented primary health care system with services provided through teleconsultation network, community health workers and community-owned focus groups. This is partially funded by a farmer-owned Community Health Insurance scheme complementing the National Health Insurance Scheme (NHIS).

KKFU uses an alpha numeric, geo-reference for designing unique health IDs for its members (cocoa farmers and their dependents). The IDs are generated from the following:

- The Specific Cocoa Region
- The Specific Cocoa District
- The Specific Society
- Number of wives in specific order
- Number of Children of specific wives in specific order

EXAMPLE of KKFU Health ID:

WS5-06-108-229A05; which can be interpreted as follows:

Code	*WS*	*5*	*06*	*108*	*229*	*A*	*05*
Meaning	Western South Region	Cocoa District eg Dadieso	Buying Company eg Kuapa Kokoo	Society eg Alikrom	Head of Household, Usually Male	First Wife	Fifth Child of First Wife

Dr. Bedzrah discussed the rational and the need for KKFU Unique Health ID:

- Community definition and Characterization
- Effective health data gathering
- Creating useful Mapping Systems and Geo-coding to aid disease pattern determination

- Effective techniques for prioritizing problems
- Objective matching of problems to established interventions
- Effective storage and utilization of clinical and health records of patients
- Strengthening Referral systems

The Need for Geo-Tagging/Mapping

Geo-Tagging is a good tool for spatial dimension to disease pattern determination and for effective communication of the issues in a pictorial context with less text. It shows linkages between two or more variables, depicts the extent/intensity of a problem, highlights both localized and diffused issues and compares information from different time periods. To strengthen intervention programmes for members of the KKFU there is need for proper detailed registration of farmers with images and possibly biometric data. Geo-tagging and gathering of geo-referenced health data of cocoa farming communities will enhance planning and distribution of resources. There is need for resource mobilization to enable the use of cutting-edge technology including GIS in data gathering and management.

Finally, Dr. Bedzrah shared some of the challenges faced by KKFU and the plans to rectify tackle them. These include the inability of the database to capture image or biometric data of farmers. Most farmers do not have unique names and their frequent relocation to other communities for new jobs and new farms presents tracking difficulty. There are also challenges of multiple registrations by farmers and the availability of limited resources and investment in digital technology for registration.

3.3.5 Clinic-Based ICT Systems

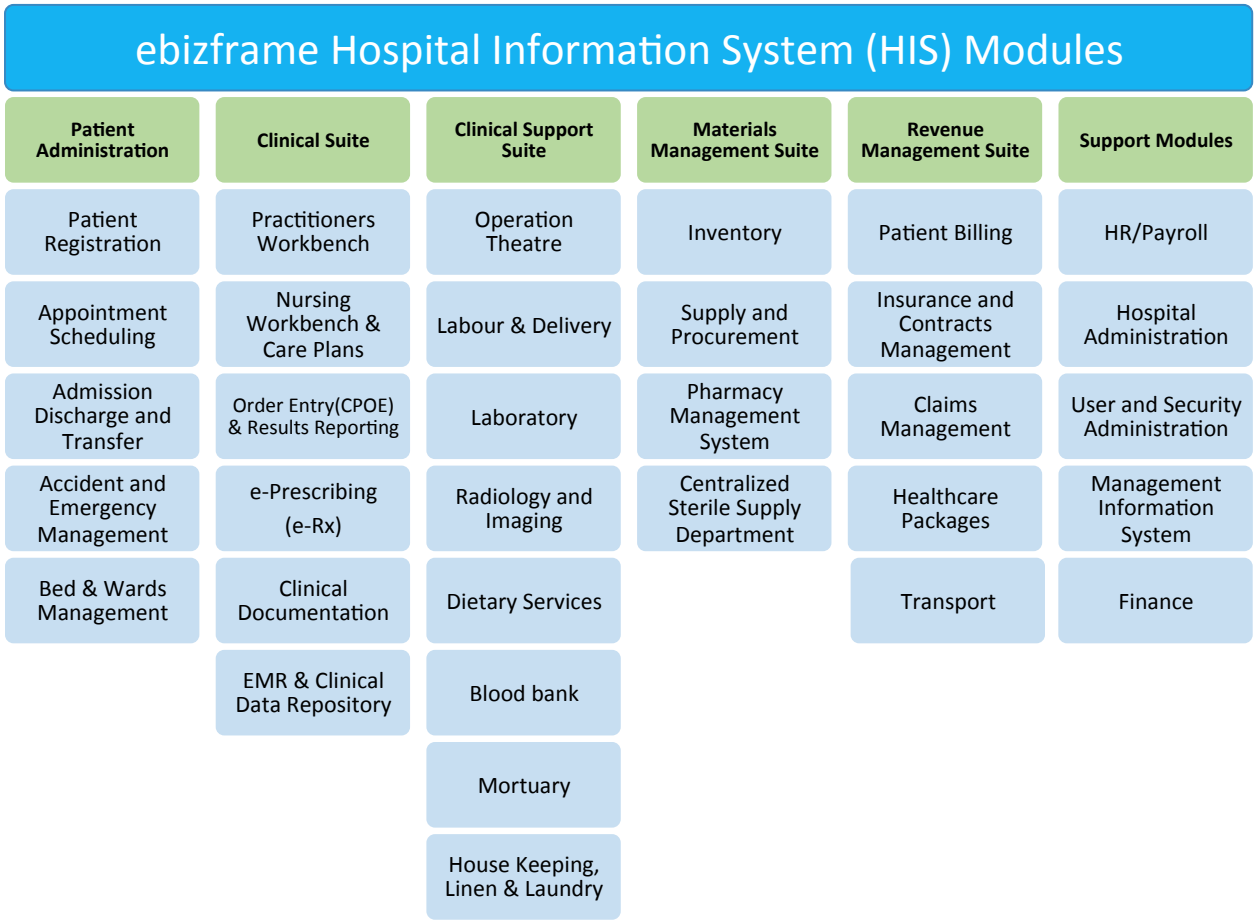
Presentation by Sandeep Yadov and Ferdinand Hiagbe, IPMC, Ghana

IPMC has over the years commanded a huge global presence in the area of ICT. In Ghana alone, the private company has 19 branches across the country with diverse interventions. According to the presenters, the IPMC software solutions include: **Hospital Information System, Enterprise Resource Planning, Mobile Solution, and Business Intelligence.**

IPMC's MySQL Based Healthcare solution is capable of taking care of any 30-500 bed facility, whereas the Oracle Based Healthcare solution takes care of facilities with over 500 beds. Besides its constant technological innovations, IPMC currently supports a national e-record pilot in 3 health facilities with:

1. **Korle Bu Teaching Hospital, Accra** as a tertiary healthcare provider
2. **Upper West Regional Hospital, Wa** as a regional healthcare provider and
3. **Zebilla District Hospital,** as a district Healthcare provider

The Hospital departments and units are connected via LAN or WLAN. Others are connected via Fiber, WiMax and LTE and Centralized EMR solution.



Health Information System for hospital management

3.3.6 E-Governance Initiatives and Implications for Health

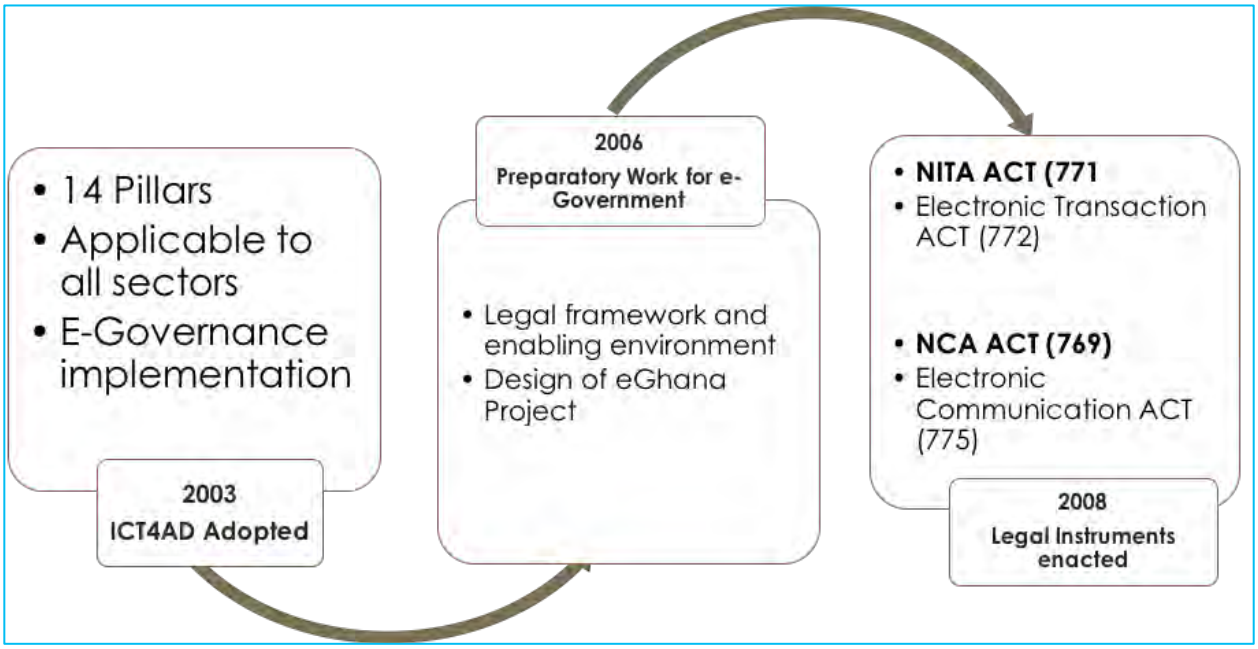
By Mrs. Veronica Boateng, National Information Technology Agency

Mrs. Boateng stated that National Information Technology Agency (NITA) was carved out of the Ministry of Communications as a government ICT agency to regulate the provision of ICT services, ensure the provision of quality ICT and to promote standards of efficiency in ICT. Key drivers and enablers of NITA's operations are the people, processes, Technology and policy.

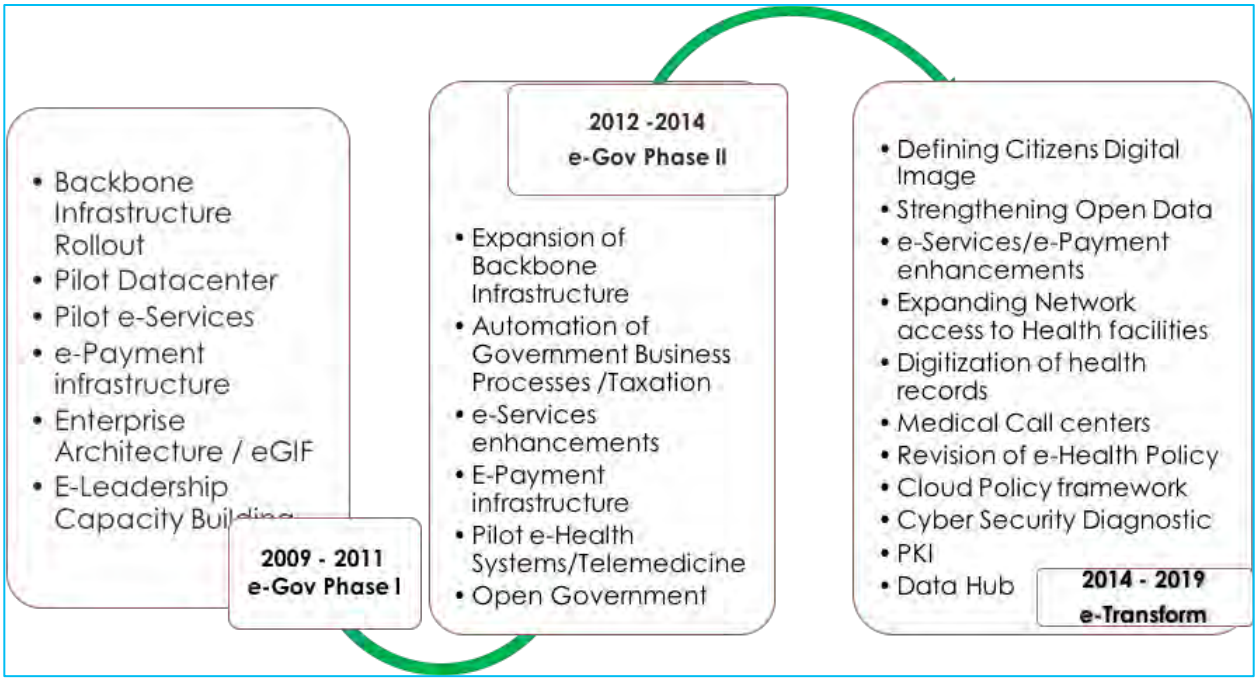
E-governance is the use and application of information technologies in public administration to streamline and integrate workflows and processes, to effectively manage data and information, enhance public service delivery, as well as expand communication channels for engagement and empowerment of people.

Drivers and Enablers of NITA's operations

Evolution of e-Government Strategy -1

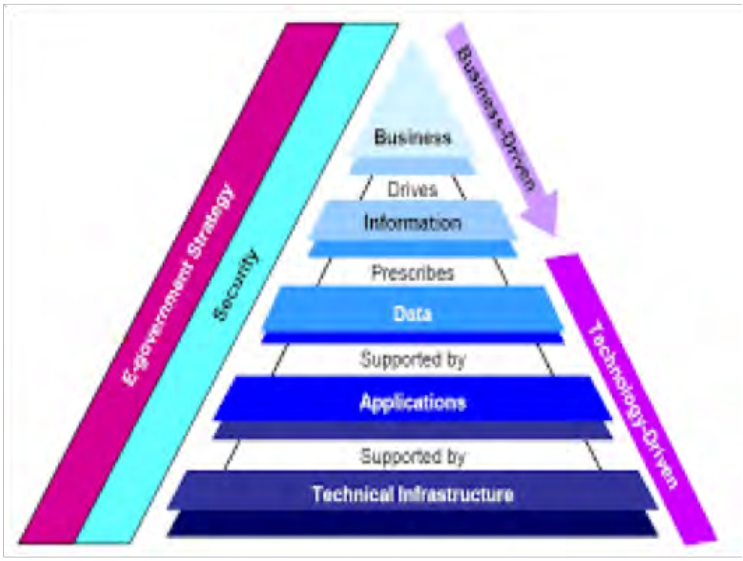


Evolution of e-Government Strategy -2



Government Enterprise Architecture & eGIF

- DATA ARCHITECTURE AND STANDARDS
- BUSINESS ARCHITECTURE
- SECURITY ACHITECTURE
- TECHNOLOGIES
- LOGICAL APPLICATIONS FRAMEWORK
- INFRASTRUCTURE FRAMEWORK
- PROCESSES/PROCEDURES
- COMPLIANCE MONITORING
- CATALOGUE OF TECHNICAL AND DATA SHARING STANDARDS



Enterprise Architecture - eGIF

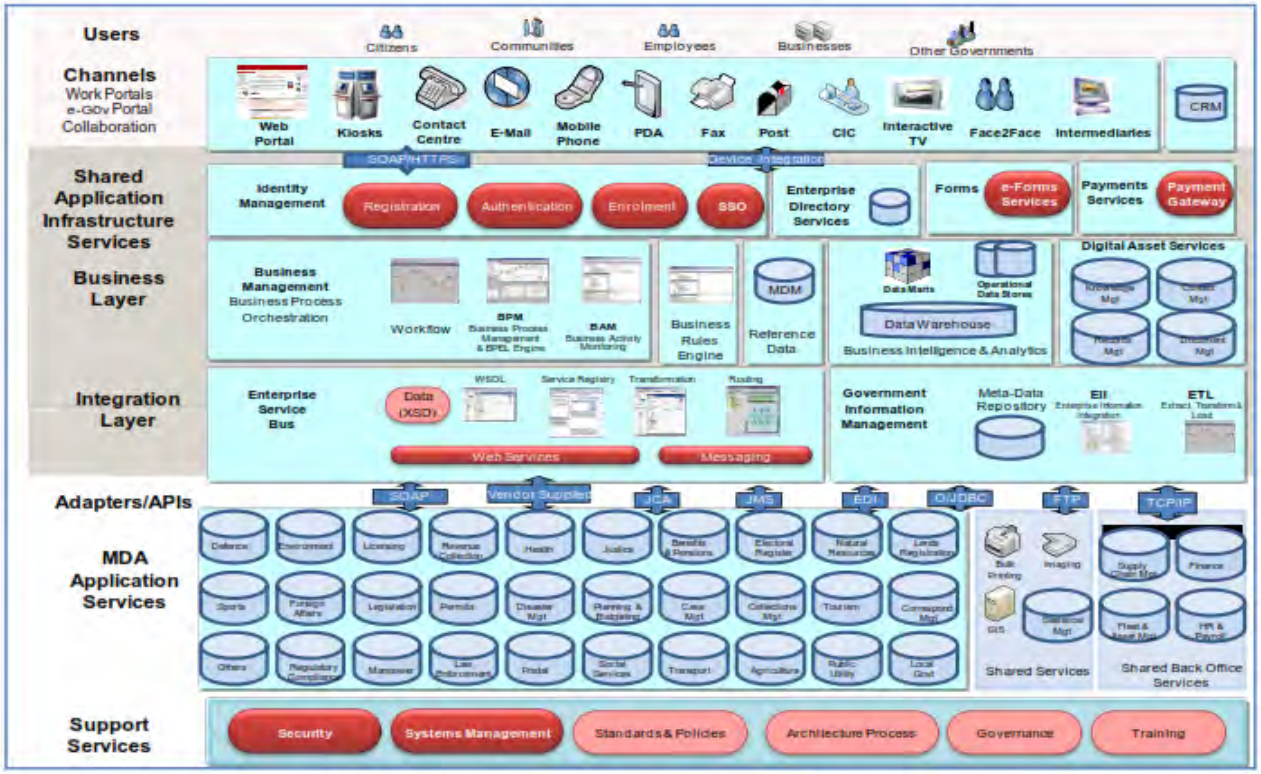
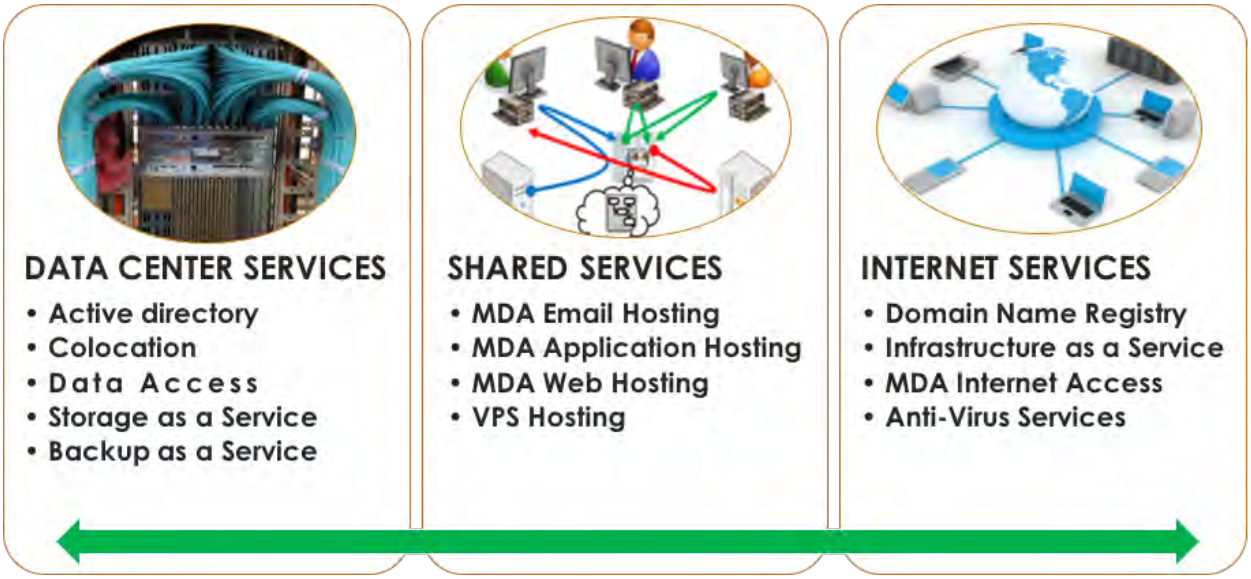


Figure 20: ***Logical Applications Architecture***

NITA Infrastructure Services



The Pilot eHealth System

A number of eHealth systems have been initiated by NITA. These include the following:

- Integrated Hospital Management System
- Patient Management System with unique MID with NHIA/NIA/EC Cards
- Drug Database/ ICD10
- Supply of Servers, Personal computers, UPS for End user PCs
- eHealth Blue Print
- Connectivity/ Tele-Presence System
- Integration with eClaims

NITA's available website

NITA has made available the following official websites for its initiatives and services:

- nita.gov.gh
- support.nita.gov.gh
- epay.gov.gh
- eservices.gov.gh
- data.gov.gh
- itag.org.gh
- gwiit.org.gh
- gdnr.org.gh
- nic.gh
- isoc.gh

ICT HEALTH FORUM, DAY 2- 29TH JUNE, 2016

Haven laid bare the current ICT and past integrated health ID interventions in Ghana, participants worked in groups to brainstorm on a roadmap for the ICT integration. Participants were put into four groups to deliberate on various topics. The groupings were:

Group A:	Facility based systems
Group B:	Architecture and System Designing
Group C:	Policy and regulation
Group D:	Community-based GIS / Remote sensing and mobile applications

Group Work Plenaries

GROUP A: FACILITY-BASED SYSTEMS

Participants

1. John Gachago
2. John Eliasu Mahama
3. Debrah Felix
4. Ferdinand Hiagbe
5. Asiedu Raldwin Richard
6. Emmanuel Attoh

7. Sharon Aboagye
8. Kofi Dankwah Manu
9. Hilary Asia Abii
10. Esther Azasi
11. Abhinav Seetharaman
12. Chantal Ghanney
13. Dr. Safo

Technology

There is resistance to innovation and traditional models make introduction of technology difficult. Lack of funding impedes the introduction of new technologies. The available technologies have become fixated and limited to the tertiary institutions leaving the lower levels deprived. There is rarely any official training on new technologies brought into the country.

District Health Information Management system

The Ghana Health Service has an established DHIMS which is used to collate country-wide health data. It is accessible at all the various levels of the health system in the country.

E-tracker

The e-tracker has been piloted in 2 districts and resources are being scaled up to provide national coverage.

eHealth Records

Ghana's largest hospital, the Korle-Bu Teaching hospital is 65% ready for e-Health. The goal of the eHealth system is to provide the platform for real-time data transmission. Challenges with this include the lack of common platform to integrate data, the absence of a central data base, and the non-existence of a stand-alone data systems for Labs and Diagnostics centres. As of now no labs are connected to the hospital's electronic records. The Hospital records are currently all manual. The pilot programme for the eHealth records is being piloted at the Korle-Bu Polyclinic and this will become operational at the main KBTH by September 2016. This is done in collaboration with the IPMC to establish unique IDs for clients.

National IT Agency (NITA)

NITA links information from all regions adopting requirements and standards such as ICD and HIPAA. Other parties involved are the Ministry of Communications (MOC), National Health Insurance Authority (NHIA) and Christian Health Association of Ghana (CHAG).

a. Processes

The major challenge is the lack of funding for the integrated health system. The design however is to link information on walk-in clients at the tirage centre of the Korle-bu Polyclinic to that of the main Teaching Hospital. In this case information on referral cases can be easily assessed on the integrated eHealth system at the KBTH. With the exception of trauma and surgical emergencies that are entered into the system directly at KBTH all other walk-in are entered into the system at the polyclinic.

Ambulance services (193) are also integrated into the eHealth system. A client can call the Control room for information to nearest station. Dispatch of ambulance services can be triggered directly from the eHealth system directly. Response time currently is 18 – 20 minutes which is higher than the set standard of 8 minutes. With the Ambucare software data can be captured using a tablet.

b. Institutions

The institution pyramid begins with the Primary (CHWs) to the Secondary (District Hospitals) and to the highest Tertiary (Regional hospitals). The hierarchy in the health facilities are overseen and monitored by the Ministry of Health (MOH) and the Ghana Health Services (GHS).

c. People

Players in the ICT industry are rarely consulted or trained for the technology, innovations or changes made. However, Regions and Districts have trained Health information staff on the use of the various eHealth systems.

Basic eHealth Infrastructure

- Universal ID
- Common eHealth Standards
- Electronic Payment systems
- Remote service architecture
- Adapted workflows and protocols

GROUP B: ARCHITECURE AND SYSTEMS

Participants:

1. Mr. Kash Patel
2. Mr. Sam Quarshie
3. Abhinav Seetharaman
4. Ms. Angela Odoi

5. Dr. Fred Bedzrah
6. Dr. Francis
7. Mr. Emmanuel Attoh
8. Mr. Reuben Tetteh

1. What is the current situation?

The eHealth architecture in Ghana is designed and headed by Ghana Health Service (GHS). There is also architecture headed by NITA. The questions that arise are "whose architecture is better?" Which one sets the precedence? Do the Health IT personnel lead the way, or do the IT people lead the way?

The experts believe that it is not good to have several different architectures since it presents with many short-term and long-term challenges. Despite the availability of the documents and necessary information, capable IT professionals are lacking to handle certain specific challenges that arise.

2. What is the current direction?

Data storage is not centralized rather, it is present in many smaller-scale databases. It was recommended that GHS set up a data center at the district, regional and national centers.

3. What ought to be done?

The following suggestions were made:

- Resources
  - There is need to have resources at the facility level
  - Leadership needs to improve
  - Need to properly identify the technical experts to implement the system using their skillsets
  - Framework for government needs to be socialized
  - Create a centralized IT directory which contains contact information of people with good experience and knowledge
- Create hubs within each region of Ghana
  - These hubs would have patient information from all sites within each region
  - This will be useful, especially since people in each region typically don't go to other regions for healthcare services
  - Eventually, these 'hubs' will overlap and become interconnected
- Make ICT autonomous

- ICT should stands out as a full directory that controls its own domain
- The organizations should have the capacity to control their own ICTs and consult NITA if there is a situation beyond them

- Use ICT in the public sector
  - Pick the salient features in it, and confirm what standard we are specifically looking for
- Strengthen the enterprise architecture framework
  - GHS should recognize and certify the various service providers
  - GHS should set the standards which will have in place the best and most up-to-date practices
  - GHS will have to certify any new proposals/ideas (hardware, software, etc.) before they can be implemented
- Make all databases centralized
  - With one central database, we can take all the analytics from it
  - This makes it much easier to collect, store, and access data from many different avenues and sources
- Hospital and clinic desks should collect information on any patient who walks into a healthcare facility
  - This will help in centralizing all data
  - Very important for the identification system/software/database to be transmitted to trusted sources
  - Hacking and other malicious practices in the system should be prevented at all cost.
- Come up with a national standard in terms of nomenclature
  - This will aid in data centralization with the ultimate goal of the unique identification card.

4. What will it take to get there?

- Focus on 3 primary categories
  - Architecture – Introducing the proposal and establishing the framework
  - Governance – Strengthening the framework

	Enabling Environment, Regulatory Environment	Governance and Business Use Regulations	Cyber Security and Privacy-Protected National Platform
What is the current situation? • laws, statuses, Acts • ICT policies on health • governance mechanisms • institutions • processes			
What is the current direction?	The frameworks and policies are present		
What ought to be done?	• IT governance system needs to be more defined for health sector • There is an issue with compliance with existing frameworks. NITA should perform a regulatory function. • There needs to be more awareness about policies and standards in order for implementers of technology to follow. • There is a need for regular coordination meetings between regulatory agencies and implementers to understand standards better in order for them to comply. • Identify a pilot site where we can test standards, policies prior to rolling out expectations of meeting these standards nationwide. • Landscape analysis determining the extent to which technologies are following guidelines and support to help them comply over time. • Take a phased approach to conforming to standards.		
What will it take to get there?			

  - Leadership – Proper execution of the proposal and continued maintenance of high standards
- Think 'small' and build up ideas
  - Being overambitious and constructing large proposals first will lead to issues down the road
- Proper execution of proposals
  - It is much better to have a mediocre plan and great execution, rather than a great plan and no execution

GROUP C: POLICY AND REGULATION

Participants

1. Mrs Veronica Boateng
2. Dr. Patrick Aboagye
3. David Berman
4. Joseph Tetteh
5. Samuel Cudjoe
6. Yahaya Daudi
7. Bright Asare Boadi
8. Dr. Van Otoo
9. Justin Zode
10. Dr. Linda A. Vanotoo

GROUP D: COMMUNITY BASED, GIS, REMOTE SENSING, MOBILE APPS

Participants

1. Mr. Joseph Sakyi Baah
2. Ms. Mohini Bhavsar
3. Rep of Arnhold Institute for Global Health
4. Winfred
5. Samuel Agra
6. James Faghmous
7. Eben Ankra
8. Justice Sevugu
9. Jackie Brown
10. Denis Annan
11. David Glass
12. Edem Kawuba
13. Bruna Silva
14. Eric Akosah
15. Irene Lansah

	Technical Possibility + Smartphone based apps, linking households with the health system	Unique biometric IDs for use in health informatics and health services	Resource requirements for smart phone apps at community level	Integrating data of health facilities
What is the current situation	• CHWs largely using paper based data collection. • There are some mobile apps at community level by different org (govt, NGOs, private sector) • Fragmented (different content, standards, duplication) • Mobile apps at community level are not linked to CHPS (next level up from community) • Apps only focus on certain segment of community health services (e.g. FP, MCH only) • Currently, the infrastructure does not exist in order to build apps that support location based services (GIS)	• There is a national champion/institution responsible for implementing UID in Ghana. (NIA) • UID systems and standards do not exist in Ghana today. • The implementation of National ID system was attempted and has been a work in progress for 10 years • Frameworks for identifying providers and clients are available from NITA / NIA today • Unsure if these data elements are also reflected in GHS registries used at the community.	• NGOs supporting adoption and support of mobile apps at CHW level • 85% of country covered by national grid. However stability is uncertain • In some regions, solar power is a good back-up solution for poor/unreliable electricity (e.g. Northern Ghana). Solar power solutions can be procured locally in Ghana • We do not have enough information to comment on internet coverage in Ghana. But this is an important requirement to understand • MNOs likely see more profit in investing in cities compared to rural areas. We would like to	• CHPS is last formal unit at community level • GHS piloting eTracker in a few districts in central region • eTracker is only designed for CHPS. Not hospital level. Private sector can address tech needs of hospitals • Mobile apps at community level are not linked to CHPS

			reach rural areas • We are able to negotiate data rates with telcos. (E.g. 300 MB + closed user group + SIM card = 5 cedis per month per user)	
What is the current direction	• GHS seeks for eTracker to scale from CHPS level to community level.	• The need for implementing UID is clear for stakeholders. • There is a need for political will. The institution responsible should be funded and have the resources to make this happen.	• Human Resources: Youth Employment agency are recruiting and training 1000 youth eHealth Technical Assistants. These people will work from district offices and travel to support CHWs • Each district will have 4 eHealth Technical Assistants. • eHealth Technical Assistants are only employed for 2 years to prepare them with employment skills • They are paid ~ minimal wage in Ghana.	
What ought to be done	• Community level apps just like eTracker should cover comprehensive list of health services (e.g. MCH AND FP	• We cannot wait for UID system to be implemented for community level systems to be put in place.	• Hardware and software chosen needs to be flexible and configurable in order for UID integration to be incorporated down	Community apps should link to eTracker, which is used at the next level.

	AND xyz) • Set some prioritization around what services should be covered / deployed first. Phase in other services over time. • Creation of a spatial data repository in order to eventually support / integrate location based apps / services.	• We can incorporate full UID integration once requirements are available. • Capture at least what is available / recommended now for patient and provider registration in the apps.	the line. Software should be open source and interoperable • Engagement of Mobile Network Operators to cover the whole country in order to provide apps for CHWs in all communities. (i.e. some areas we use Airtel, in others we use Vodafone) • Data plans for CHWs using apps have to be managed at the central level to assure there is no interruption in MoH receiving data from community levels.	

What will it take to get there

4.0 CLOSING AND NEXT STEPS

The proceedings of the forum were brought to an end at a closing ceremony with the Director General of the Ghana Health Service and Prof. Jeffrey Sachs of the Earth Institute.

Closing Remarks by Dr. Ebenezer Appiah-Denkyira, Director General, GHS

Dr. Ebenezer Appiah-Denkyira, Director General of the Ghana Health Service (GHS) in his closing remarks congratulated participants for their immense contribution and insights to the ICT conference objectives. He specially thanked Prof. Jeffrey Sachs and Dr. Prahbjot Singh for bringing on board leading experts in the field of ICT and health, such as Dr. Sam Pitroda of India, to support the ICT brainstorming exercise.

Dr. Appiah-Denkyira assured stakeholders of the judicious use of the brainstorming outcomes for improved health services. He announced that the GHS, Ministry of Health (MOH) and partners are "determined to ensure that this process doesn't end with the end of this (ICT) forum." To ensure continuity and follow-up on the forum's key decisions, the service will commission an "*ICT for Health Working Group*" and members will be drawn from key actors and participants of the conference. The working group will be required to facilitate "the development of a costed Technical Roadmap that synthesises inputs from the various working groups of the forum by close of year, 2016. An ICT for Health "*Community of Practice*" will equally be established to ensure continuous engagement among conference participants to implement the roadmap.

Conclusion

The Ghana Integrated ICT for Health forum was successfully hosted at the Institute for Statistical, Social and Economic Research (ISSER), the University of Ghana. Findings revealed that the country had competitive architectural designs and numerous ICT platforms available for different purposes ranging from health to business. Unfortunately, the process of streamlining fragmented architectural designs into national eHealth policies and protocols has stalled over the years largely due to poor leadership. The ICT forum presented as a suitable platform for the National Information Technology Agency (NITA), Ministry of Health (MoH) and other ICT and eHealth governing bodies to get many ICT engineers complying by set rules. The National Identification Authority (NIA) must also seize the opportunity to expedite deployment of the national identification system in the country. With support from global partners like Professor Jeffrey D. Sachs, Special Advisor to the United Nations Secretary General and Dr. Sam Pitroda, India the government of Ghana can achieve an integrated ICT for health and development.

Next Steps

To implement next steps, a technical working group was set up to drive the achievement of the conference objectives. The group will be responsible for ensuring the execution of the following next steps:

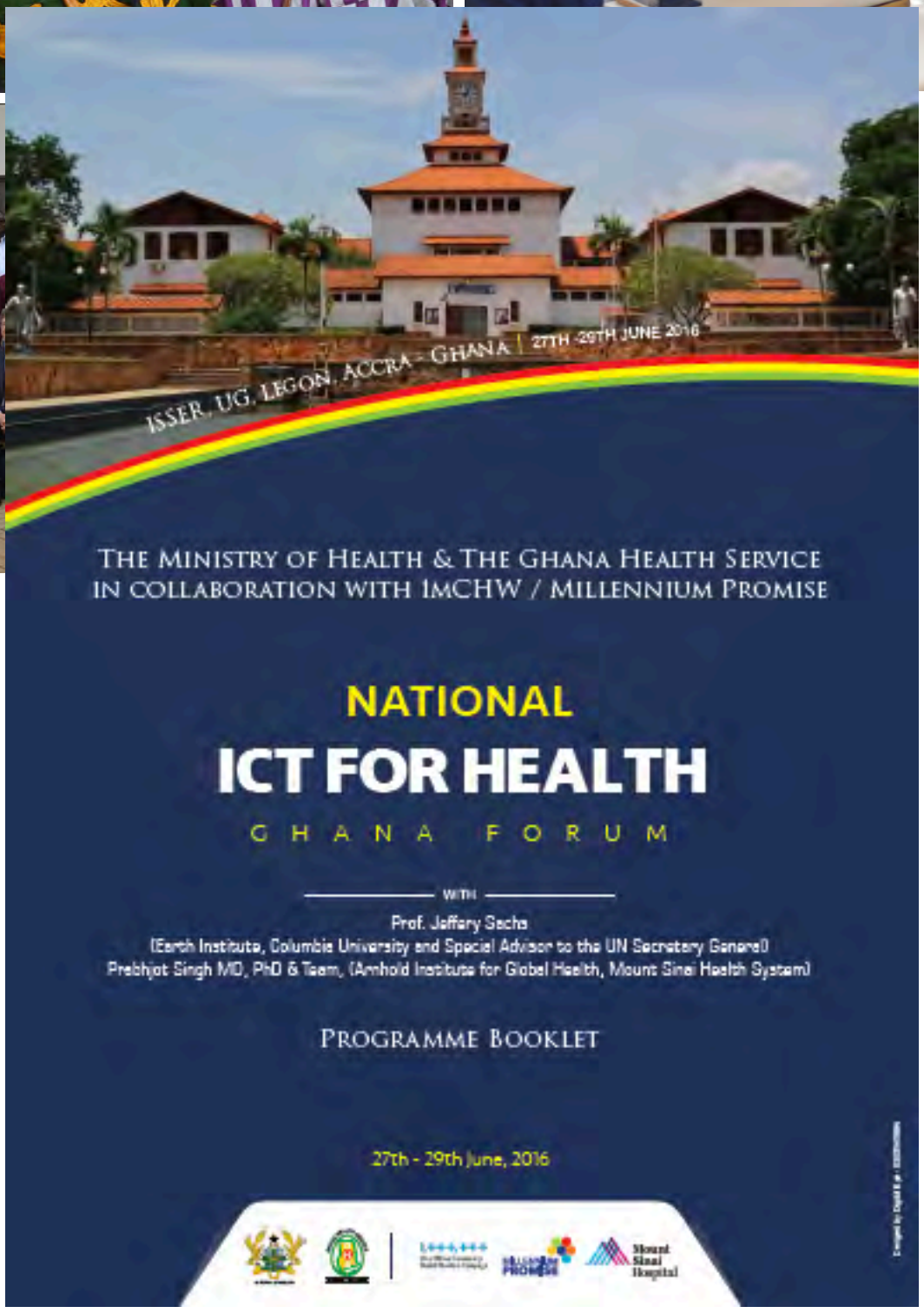
1. Assess and review annually, milestones of coverage, necessary components in terms of hardware, software, programming, online functionality, training etc. including broad-band connectivity, open source software, universal unique ID, internet

connectivity, GIS, interoperable, multipurpose and secure and to include social network;
2. Identify critical technologies necessary for the eHealth system;
3. Develop a strategic plan for submission to the government. The plan should include specific objectives, activities, resources, responsible persons and detailed timelines. For effective results, include key organizations from the public and private sectors; make strategy specific so that it is feasible and implementable
4. Develop a comprehensive budget;
5. Target the MoH, NHIA, International Partners (India) and the private sector for raising funds;
6. Advocate for Ghana to make a formal request to India for support

The first phase of the Working Group will commence on 1st August 2016 and work till March 31st, 2017.

APPENDIX

Annex 1: Agenda for National Forum



BRAINSTORMING SESSION ON ICTs FOR HEALTH

MONDAY 27TH JUNE, 2016 AT ISSER CONFERENCE HALL

Agenda

Time	Activity	Person(s) Responsible
08:30 – 09:00	Arrival	
09:00 – 09:05	Opening Prayer	Rev. Eric Akosah
09:05 – 09:10	Welcome Address	Dr. Afisah Zakariah, Chief Director, MoH
09:10 – 09:20	Introductory Remarks	Prof. Jeffrey Sachs
09:20 – 09:40	Participant expectations	Moderator – Chief Nat
09:40 – 10:00	Policy Environment for "ICTs for Health" and National eHealth Strategy	Dr. Odame, PPME, MoH
10:00 – 10:15	National Identification System and implications for health	Reuben Tetteh, NIA
10:15 – 10:30	eGovernance initiatives and Implications for Health	Mrs. Veronica Boateng, NITA
10:30 – 10:45	The Relevance of Health IDS in Telemedicine Implementation at National and International Settings	Dr. John W. Gachago, JWG Global Ltd.
10:45 – 11:00	Overview of Ghana Telemedicine Project	Joseph Adomako, GHS
11:00 – 11:15	Telemedicine and Integrated facility-based ICT for health system	Dr. Kwaku Darkwa, Chief Medical Officer, Sanford Hospital
11:15 – 11:45	*Snack Break*	
11:45 – 12:00	Integrated health ID system for cocoa cooperative	Dr. Fred Bedzrah, Director of Health Services, Kuapa Kokoo
12:00 – 12:15	Clinic-based ICT Systems	Rep., IPMC
12:15 – 12:30	Towards an integrated health ICT system in Ghana – the eHealth Records: Progress, Challenges and Lessons learnt	Mr. Sam Quarshie, Head, ICT Department, GHS
12:30 – 12:45	GIS and Public Health	Winfred Dotse-Gborgbortsi, Public Health Researcher and Geospatial Analyst
12:45 – 13:00	eHealth initiative of the MVP	Joseph Sakyi-Baah, 1mCHW Campaign, Millennium Promise
13:00 – 13:15	Family Health Mobile App	Angela Naa Odoi, FHD, GHS
13:15 – 14:15	*Lunch Break*	
14:15 – 14:30	The Role of Academia Towards "ICTs for Health"	Aelaf Dafla, Ashesi University, Accra
14:30 – 14:45	MCSP eLearning Priorities and Lessons Learned	Richard Attandoh & Leonard Mensah, JHPIEGO
14:45 – 15:45	Discussions and Review of Forum's Agenda	Moderator – Chief Nat
15:45 – 16:00	Closing Remarks	Dr. Sonia Sachs, Director of Health, 1mCHW Global Campaign
16:00	**Closing**	

OPENING CEREMONY, ICTS FOR HEALTH GHANA FORUM

28TH JUNE, 2016 AT ISSER

Time	Activity	Person(s) Responsible
09:00 – 09:30am	Arrival of Guests/Dignitaries	Ushers
09:30 – 09:35am	Opening Prayer	Rev. Dr. Philip Arthur Gborsong (Head of Department of Communication Studies, UCC)
09:35 – 09:40am	Introduction of Dignitaries	Moderator – Mr. Tony Goodman
09:40 – 09:45am	Introduction of Chair	Esther Azazi
09:45 – 09:50am	Chair's Remarks	Hon. Nee Prof. John S. Nabila, Member, Council of State & Pres. National House of Chiefs
09:50 – 10:00am	Welcome Address and Purpose of Meeting	Dr. Afisah Zakariah (Chief Director, MoH)
10:00 – 10:10am	Cultural Performance	Kusumgbo Cultural Troupe
10:10 – 10:20am	Project Remarks	Prof. Jeffrey Sachs (Director of Earth Institute, Columbia University and Special Advisor to the UN Secretary General)
10:20 – 10:35am	Special Address	His Majesty King Dr. Odaifio Welantsi III, Paramount Chief of Nungua Traditional Area
10:35 – 10:40am	Closing Remarks	Chairman
10:40 – 10:45am	Vote of Thanks	Dr. Dinah Baah-Odoom
10:45am	Prayer/Closing	Rev. Dr. Philip Arthur Gborsong

Tuesday 28th June, 2016

07:45 – 08:45	Registration
09:00 – 09:30	Arrival of VIPs and Invited Guests
09:30 – 11:00	Opening Ceremony (see separate agenda)
11:00 – 11:30	Group Photograph / Snack Break

MC: Chief Nat Ebo Nsarko

11:30 – 13:30 **Session 1: ICTs and Health – Setting the Stage**

Co-Chairs: Hon. Mavis Ama Frimpong, Minister, Eastern Region; and Mr. Kash Patel, Vice President for Population Health and Analytics, Mount Sinai Medical Center

11:30 – 12:30 **Presentations** 15min each

1. Leveraging ICTs for an integrated Health ICT system in the SDG era by Prof. Jeffrey Sachs
2. Towards an integrated health ICT system in Ghana – the eHealth Records: Progress, Challenges and Lessons learnt. Mr. Sam Gueshie, Head, ICT Department, GHS
3. Family Health Mobile App - Angela Naa Odoi, FHD, GHS
4. International experience creating integrated ID system for Health. / Non-Communicable Disease Management using basic e-health Systems by Dr. Prabhjot Singh

12:30 – 13:30 **Panel Discussion**

Panel: Dr. Patrick Aboagye, Director, FHD, GHS; Dr. Ernest Opoku, Regional Coordinator; USAID Ghana Systems for Health; Mrs. Veronica Boetang, NITA; Mr. Amardeep Singh Heri, CEO, IPMC

13:30 – 14:30	Lunch Break
14:30 – 14:45	System Implementation and User Integration by Stella Sefo, and Bruno Silva, Arnhold Institute for Global Health

14:45 – 17:00	**Session 2: Key considerations for designing an integrated ICT system for Health in Ghana**
Moderator:	Dr. Alexis Nang-Baifubah, Ashanti Regional Director of Health Services, GHS
14:45 – 15:15	Discussion
Speakers:	Mr. Chris Bogert, MA; James Feghmous, Chief Technology Officer, Arnhold Institute for Global Health; Dr. Odame, Director PPME, MoH
Themes:	• Technical Possibility • Enabling Environment; Regulatory environment; Health Data Governance and Business-Use Regulations • Cybersecurity and Privacy-protected national platform for integrating the data of health facilities (clinics, hospitals) and health workers, including patient-level electronic medical records • Medico-Legal issues • Political will • Resource requirements • Unique biometric ID for use in health informatics and health services • Smartphone-based apps linking individual households with the health system (text messages, alerts, call-in numbers)
15:15 – 15:30	Discussion and Groupings
15:30 – 15:45	Regenerative Break
15:45 – 17:00	**Breakout Groups:** Development of Roadmap towards an Integrated Health ID system for Ghana

Group A: Facility based systems
Group B: Architecture and System Designing
Group C: Policy and regulation
Group D: Community-based GIS / Remote sensing and mobile applications

Wednesday 29th June, 2016

08:30 – 09:00	Opening Remarks by Dr. Afiseh Zakeriah, Chief Director Ministry of Health
08:30 – 09:00	Current ICT Initiatives in SADA Zone by Mr. Charles Abugre, CEO, SADA
09:00 – 10:30	**Session 3: Optimal usage of integrated ICT systems for Health**
Moderator:	Prof. Prabhjot Singh, Annhold Institute for Global Health
09:00 – 09:30	**Discussion**
Speakers:	Mr. Sam Quarshie, Head of ICT, GHS; Dr. John Gachago, JWG Global Ltd and Rep. of Kofi-Annan ICT Centre; Dr. Isaac Frimpong Manso-Bonsu, Director, Planning and Coordination, NDPC
Themes:	• Real time surveillance of emerging or resurging diseases; • Real-time vital events (births, deaths); • Remote monitoring of patients (e.g. BP and other indicators); • Remote diagnostics (e.g. radiology) and telemedicine
09:30 – 10:30	**Breakout Groups**

Brainstorming on the best ways to use the system:

Group A: Facility based systems
Group B: Architecture and System Designing
Group C: Policy and regulation
Group D: Community-based GIS / Remote sensing and mobile applications

10:30 – 10:45	Snack Break
10:45 – 11:30	Plenary: Group Presentations (from breakout sessions of day 1 & 2)

11:30 – 13:00	**Session 4: Funding and Resource Requirements for an Integrated ICT for Health System in Ghana**
Plenary Discussion Moderated by Prof. Jeffrey Sachs	
Discussants:	Rep. from Development Partners; Rep. Bilateral Donors; Rep. Private Sector; Rep. Gov't.

Closing Session

13:00 – 13:20	Next Steps – Dr. Afisah Zakariah (Chief Director, MoH)
13:20 – 14:00	Closing Remarks • Chief Net Ebo Nsarko, Country Director, 1mCHW • Prof. Prabhjot Singh, Arnhold Institute for Global Health • Prof. Jeffrey Sachs, Director of Earth Institute, Columbia University and Special Advisor to the UN Secretary General • Dr. Ebenezer Appiah-Denkyirah, Director General, GHS • Government Representative

Annex 2: Participants for ICT Brainstorming Session – 27th June, 2016

INTEGRATED ICTS FOR HEALTH CONFERENCE
GHANA FORUM
BRAINSTORMING SESSION - 27TH JUNE, 2016
ISSER, LEGON

SN	Name	Organization	Position	Region
1	Rev. Dr. Kwaku Darkwa	Sanford World Clinics	C. M. O	Greater Accra
2	Kofi Dankwah Manu	National Ambulance Services	I.T Assistant	Greater Accra
3	Eric Akosah	1mchw/GHS	CHW Prog. Coord.	Ashanti
4	Bright Asare Boadi	Imchw	Assist. CHW Prog. Coord	Ashanti
5	Jacob Sackey	Ghana AIDS Commission	D (Finance)	Greater Accra
6	Degboe K. Kekely	NADMO	SPDCO	Greater Accra
7	Dr. Fred Bedzrah	Kuapa Kokoo	Director Of Health Services	Ashanti
8	Justin Zode	Millennium Promise	Fin. & Admin Manager	Ashanti
9	Millicent Yao-Dablu	Pentecost Hospital	Health Info. Officer	Greater Accra
10	Chris Sowah	TV 3	Cameraman	Greater Accra
11	Dr. Afisah Zakariah	Ministry Of Health	Ag. Chief Director	Greater Accra
12	Sam Quarshie	Ghana Health Service	Head, ICT Department	Greater Accra
13	Hammond Darkwah	Ghana AIDS Commission	IT Manager	Greater Accra
14	Dennis Annang	Ghana AIDS Commission	M & E Officer	Greater Accra
15	Joseph Adomako	Ghana Health Service	National Telemedicine Manager	Ashanti
16	Lydia Owusu-Ansah	Ghana Health Service	MISO Coordinator	Ashanti
17	Justice Sevugu	Ghana Health Service	District Director, GHS	Ashanti
18	Clement Nti-Boateng	Ghana Health Service	District Director, GHS	Ashanti

19	Adwoba Bota	Oasis Web Soft	Software Engineer	Greater Accra
20	Ruth Arthur	NADMO	Chief Disaster Control Officer	Greater Accra
21	Hilary Asiah	MVP	Health Coordinator	Upper East
22	Samuel Kofi Agra	MVP	Ehealth Specialist	Upper East
23	Mustapha Issahaku	University Development Studies	Senior Lecturer, Community Health	Northern
24	Alex Ofori Mensah	CHAG	Technical Advisor	Greater Accra
25	John Gachago	E-services	eHealth Consultant	Greater Accra
26	Kojo Hayford	E-services	Chief Executive Officer	Greater Accra
27	Irene A. Lansah	National Ambulance Services	Unit Head, Research	Greater Accra
28	Jacqueline Brown	NAF	Research Unit	Greater Accra
29	Kojo Taylor	Sanford World Clinics	President	Greater Accra
30	Christina Wadwani	Novartis Foundation	Project Manager	Greater Accra
31	Asiedu Richard	Ghana Health Service	IT Manager	Greater Accra
32	Mawutemor Ashong	Ghana Health Service	IT Manager	Greater Accra
33	Joseph Mensah-Homiah	Millennium Promise	MISO Coordinator	Greater Accra
34	Thomas Adoboe	National Health Insurance Authority	Dep. Director	Greater Accra
35	Naa Odoi Angela	GHS/FHD	Programme Assistant	Greater Accra
36	Peter Yeboah	CHAG	Executive Director	Greater Accra
37	Sharon Aboagye	Sanford World Clinics	Director, Operations	Greater Accra
38	Reuben Tetteh	National Insurance Authority	Dir, ICT	Greater Accra
39	Joseph Tetteh	Ministry Of Communication	Director, IT	Greater Accra

40	Yahaya Daudi	Ministry Of Communication	IT	Greater Accra
41	David Quainoo	Light Fm	Reporter	Ashanti
42	Asante Bismark	Good Life Fm	Reporter	Eastern
43	Abubakari S. Agarifo	Modern Ghana Online	Snr News Reporter	Greater Accra
44	Sandzep Yadov	IPMC	BDM	Greater Accra
45	Barbara Wuddah	Kinsbit Ventures	CEO	Greater Accra
46	David Sumbo	SADA MVP	Team Leader	Upper East
47	Peter Maari	Justice Fm	Reporter	Northern
48	Dr. Francis Asenso-Boadi	NHIA	Dep. Dir. P & R	Greater Accra
49	Dr. Cynthia Sottie	Ghana Health Service	Dep. Director,	Greater Accra
50	Fredinand Hiagbe	IPMC	ERP/HIS	Greater Accra
51	Gordon C. Adangabey	Ghana Health Service	Chief Pharmacist	Greater Accra
52	Dr. Dinah Baah-Odoom	Ghana Health Service	Deputy Director	Greater Accra
53	Thomas Kegengoh	Ghana Health Service		Greater Accra
54	Debrah Felix	K. B. T. A	ICT	Greater Accra
55	Malise Otoo	Ghana Daily News	Editor	Central
56	Abraham Hodgson	Ghana Health Service	Director	Greater Accra
57	Patrick Aboagye	GHS/FHD	Director	Greater Accra
58	Michael Bowi	Ministry Of Health	Nursing Officer	Greater Accra
59	Gabriel Nayo	School Of Nursing	Student	Greater Accra
60	Emmanuel Attoh	Ghana Health Service	It Manager	Greater Accra
61	Nana Tenkorang	Ghana Health Service	It Manager	Greater Accra
62	Nii Abono Tackie	Atti-Kace	Lecturer	Greater Accra
63	Aelaf Dafla	Ashesi	Lecturer	Greater Accra
64	Esther Tetteh	Ministry Of Local	Programme Officer	Greater

		Government		Accra
65	Richard Attandoh	JHpiego	ICT Director	Greater Accra
66	Veronica Boateng	NITA	IT Director	Greater Accra
67	Dr Opoku Fofie	Ghana Health Service	Head Of Financial Reporting	Central
68	Winfred Dotse-G	Ghana Health Service	Public Health Researcher/Statistician	Eastern
69	Domey Frreman	TV 3m Radio Onua Fm	Reporter	Greater Accra
70	Sylvia Bediako	The Punch	Reporter	Greater Accra
71	Mohini Bhavar	Dimagi	Regional Director	Senegal
72	David Berman	Mount Sinai	Chief Of Staff	USA
73	Efe Chantal Ghanney	Mount Sinai	Medical Student	USA
74	Kash Patel	Mount Sinai	It	USA
75	Eva Atiboka	TV 3	Journalist	Greater Accra
76	Suleman Ahmed	GES, Cape Coast	Teacher	Central
77	Dr. Alexis Nang-Beifubah	Ghana Health Service	Regional Director	Ashanti
78	Petrina Owusu-Achiaw	1mchw	Administrator	Ashanti
79	Esther Azasi	1mchw	Assistant Programme Officer	Greater Accra

Annex 3: Participants for ICT Forum Day 1- 28th June, 2016

INTEGRATED ICTS FOR HEALTH CONFERENCE
GHANA FORUM
OPENING SESSION - 28TH JUNE, 2016
ISSER, LEGON

Sn	Name	Organization	Position	Region
1	Dr. Gloria Quansah Asare	Ghana Health Service	Deputy Director General	Greater Accra
2	Ferdinand Hiagble	IPMC	PM	Greater Accra
3	Kofi Dankwah Manu	National Ambulance Service	It Assistant	Greater Accra
4	Joseph Adomako	GHS/Millennium Promise	Telemedicine Manager	Ashanti
5	Dr. J. Mensah-Homiah	Millennium Promise		Greater Accra
6	Deeboe K. Kekely	NADMO	SPDCO	Greater Accra
7	Kash Patel	Mount Sinai	VP IT	USA
8	Prabhjot Singh	Mount Sinai	Chair	USA
9	Asiedu Richard	Ghana Health Service	IT Manager	Greater Accra
10	John Ghachago	Eservices JWA Global	Consultant	Greater Accra
11	Simon A. Otu	Eservices JWA Global	BD Manager	Greater Accra
12	Dr. Fred Bedzrah	Kuapa Kokoo	Director Of Health Services	Ashanti
13	Justina D. Tsagli-Anomanyo	Univ. Of Ghana	Internal Auditor	Greater Accra
14	Joseph Tetteh	Ministry Of Communication	Director, IT	Greater Accra
15	Samuel Cudjoe	Ministry Of Communication	Comm. Studies Administrator	Greater Accra
16	Christine Wadhwani	Novartis	Project Manager	
17	Eric Akosah	1mchw/GHS	Programme Coordinator	Ashanti
18	David Berman	Mount Sinai	Chief of Staff	USA
19	James Faghmous	Mount Sinai	CTO	
20	Bright Asare Boadi	1mchw	Assist. CHW Prog. Coord.	Ashanti

21	Nathaniel N. Acquah	KATH IT	IT	Greater Accra
22	Edem Kaniba Hini	GHANET	Vice President	Greater Accra
23	Yahaya Daudi	Ministry Of Communication	IT Officer	Greater Accra
24	Jacob Sackey	Ghana AIDS Commission	DC (Finance)	Greater Accra
25	Dr. Alexis Nang-Beifubah	Ghana Health Service	RDHS	Ashanti
26	Clement Nti-Boateng	Ghana Health Service	District Director, GHS	Ashanti
27	Dr. Opoku Fofie	Ghana Health Service	Programmes	Central
28	Samuel Kofi Agra	MVP	eHealth Specialist	Upper East
29	Esther Azasi	1mchw	Assistant Programme Officer	Greater Accra
30	Dr. Francis Asenso-Boadi	NHIA	Dep. Dir. P & R	Greater Accra
31	Mustapha Issahaku	UDS	Lecturer	Northern
32	A. K. Roy	IMPC	Head ERP R HIS	Greater Accra
33	Ruth Arthur	NADMO	CDCO	Greater Accra
34	Mawuteor Ashong	Ghana Health Service	IT Manager	Greater Accra
35	Stella Safo	Arnhold Institute	Project Manager	USA
36	Bruno Silva	Arnhold Institute		USA
37	Debrah Felix	KBTH	IT	Greater Accra
38	Sharon Aboagye	Sanford	Dir of Operations	Greater Accra
39	Joana Deladem Kwamu	Economics	Student	Greater Accra
40	Millecent Yao-Dablu	Pentecost Hospital	Health Info. Officer	Greater Accra
41	Emefa Mensah	Univ. Of Ghana	Student	Greater Accra
42	Dr. N. K. Biritwum	Ghana Health Service	Prog. Manager	Greater Accra
43	Dr. Patrick Aboagye	Ghana Health Service	Director	Greater Accra
44	Sam Quarshie	Ghana Health Service	Head, ICT Dept.	Greater Accra
45	Emmanuel Attoh	Ghana Health	It Manager	Greater

		Service		Accra
46	Prince K. Nartey	Ghana Health Service	It Manager	Greater Accra
47	Veronica Boateng	Nita	It Director	Greater Accra
48	Seth Dapaah	Millennium Promise	M & E	Greater Accra
49	Dennis Annang	Ghana AIDS Commission	M & E	Greater Accra
50	Jacqueline Brown	National Ambulance Service	Research	Greater Accra
51	Efe Chantal Ghanney	Mount Sinai	Med. Student	Usa
52	Angela Naa K. Odoi	GHS/FHD	Prog. Assistant	Greater Accra
53	Dr. Linda A. Vanotoo	Ghana Health Service	Regional Director	Greater Accra
54	Hammond Sowah	Ghana Health Service	IT Manager	Greater Accra
55	Justin Zode	Millennium Promise	F& A Manager	Ashanti
56	Ekow Wiah	NACP		Greater Accra
57	Francis Frimpong	NACP		Greater Accra
58	Daniel Agbleyaa	Births/Deaths	Statistician	Greater Accra
59	Richard Osei Gyamfi	Births/Deaths	IT Officer	Greater Accra
60	Hilary Asiah	SADA MVP	Health Coordinator	Greater Accra
61	Petrina Owusu-Achiaw	1mchw	Administrator	Ashanti
62	Eben Ankrah	SOG	Communications	Greater Accra
63	Duke M.Opoku	Gyi FM	Broadcast Journalist	Greater Accra
64	Stephen Ofosu	Net 2	Reporter	Greater Accra
65	Kwesi Ninson	Net 2	Reporter	Greater Accra
66	Gilbert Anim	Net 2	Reporter	Greater Accra
67	Nana Ampofo	Oman FM	Reporter	Greater Accra
68	Stephen Odoi-Larbi	Kasapa FM	Online Editor	Greater Accra

69	O. K. Berchie	UTV		Greater Accra
70	Prince Ahenza	UTV		Greater Accra
71	Chris Sowah	TV 3	Camera	Greater Accra
72	Koryekpor Freeman	Today	Reporter	Greater Accra
73	Wilfred Otoo	Daily Searchlight		Greater Accra
74	Ken Sackey	GNA		Greater Accra
75	David Quainoo	Light FM	News Producer	Ashanti

Annex 4: Participants for ICT Forum Day 1- 29th June, 2016

GHANA INTEGRATED ICTS FOR HEALTH FORUM
29th JUNE, 2016
ISSER, LEGON

SN	Name	Organization	Position	Region
1	Petrina Owusu - Achiaw	1mCHW	Administrator	Ashanti
2	Dr. Alexis Nang- Beifubah	GHS	RDHS	Ashanti
3	John Gachago	eServices Africa Ltd	Consultant	GAR
4	Seth Nii Allotey	Tettey & Associates	Consultant	GAR
5	Dennis Armang	GAC	M & E Office	GAR
6	Stella Safo	Arnhold	MD	USA
7	Efe Chantal Ghannay	Mt. Sinai	Med Student	USA
8	Ferdinard Hiagbe	1PMC	PM	GAR
9	Bruno	Mt. Sinai		USA
10	Francis Frimpong	NACP/GHS	Data Officer	GAR
11	Nattomid K. Nortey	KBTH	IT	GHA
12	Debrah Felix	KBTH	IT	GAR
13	Abraham Hodgom	GHS		GAR
14	Joseph Tetteh	MOC	Dir. IT	GAR
15	Kofi Dankwah Manu	NAS	IT Assistant	GAR
16	Irene A Lansah	NAS	Head Res. Unit	GAR
17	Asiedu R. Richard	GHS	ITM	GAR
18	James Faghmom	Mt. Sinai	CTO	USA
19	Esther Tetteh	Min of Local Govt	APO	GAR
20	Angela N. K. Odoi	GHS/FHD	Prog Assist.	HQ
21	Jacqueline Brown	NAS	Research	HQ
22	Emmanuel Athoh	GHS	IT Manager	GAR
23	Sharon Aboagye	Sai ford	Dis of Dps	GAR
24	Yahoya Daudi	MOC	IT Officer	GAR
25	Degbol Kekely Kelly	NADMO	IT Officer	GAR
26	Reuben Tetteh	NIA	head IT	GAR
27	Dr. Linda A. Vanotoo	GHS	Reg. Director	GAR
28	Adjate Andrews	AITI -KACE	Director of Operations	GAR
29	Millicent Yao-Dablu	Pentecost Hosp.	H.I.O	GAR
30	Joseph Adomako	MP		
31	Mawufemor Ashong	GHS	IT Manager	GAR
32	Prince K. Nartey	EHRD, Koforidua	IT Manager	ER
33	Richard O. Gyamfi	Births/Deaths	I.T Officer	GAR
34	Daniel Agblenyasa	BDR	Statistician	GAR
35	Rubama Ani	USAID	NSS	GAR

36	Hans Garunh	GHS	IT	GAR
37	Samuel Danquah	Millenium Prom.	Team Leader	Ashanti
38	Laud Dei	World Edu.	PM	B. A
39	Emmanuel D. Adiku	Pro-Link Org	M&E Co.	GAR
40	Esther Azasi	1mCHW Campaign	Asst. Prog. Officer	Accra

REPORT

INTEGRATED NATIONAL ICT FOR HEALTH AND DEVELOPMENT FORUM