Global Digital Health Network

Formerly the mHealth Working Group

28 February 2018

Izhar Mahjoub, Co-Founder and Managing Partner of ATH Consulting, will discuss ATH's digital health transformation projects and programs in Tunisia

Helmi Ismail, Advisor of the Minister for eHealth of Tunisia, will speak on the current state of healthcare in the country

Carl Fourie, Senior Programmes Coordinatior of Jembi Health Systems, will share related implementation from a technical vendor's perspective.

Izhar Mahjoub is co-founder/CEO of ATH Consulting and a leading IT & Health Informatics expert with over 20 years of experience. Driven by his passion to bring international IT healthcare best practices to Tunisia and LMIC healthcare systems, Mr. Mahjoub focuses on solving complex and large impact IT projects in Africa and the Middle East.

Mr. Mahjoub led ATH Consulting to be the first African company in the HIMSS certified consultant program and ATH Consulting's HIMSS analytics certified consultants are conducting DIAM certifications, HL7 education and IHE interoperability trainings in Tunisia. Mr. Mahjoub currently manages many digital public and private digital transformation projects for private & public healthcare institutions. He concentrates on architectures and urbanization of information systems as well as helping determine strategic alignment in national healthcare policy.

Mr. Mahjoub's work also reaches top-class sports and health fields, which has paved the way to his acquisitions of privileged ties with international healthcare institutions. Mr. Mahjoub has trusted partnerships with international Healthcare institutions such as Himss Analytics of IHE Worldwide, WHO, JCI and HL7. Mr. Mahjoub is a graduate of the French School of Computer Science and Advanced Technology (EPITA) and currently lives in Tunis, Tunisia.

A GLOBAL HEALTHCARE IT CONSULTING COMPANY

ATHConsulting

Improving health and performance through IT solutions

OUTLINES

I. ATH CONSULTING

ATHConsulting
Improving health and performance through IT solutions

WHO WE ARE

A global Healthcare IT consulting company with an emphasis and high expertise in interoperability standards and practices

ATHConsulting
improving health and performance through IT solutions

OUR ECOSYSTEM

Positioned as a pioneer in the digital transformation of health programs in EMEA with special focus on the LMIC's in Africa.

Having adopted a global approach, ATH Consulting reached out to several international organizations in the healthcare IT industry in North America, Europe and Africa such as Himss Analytics, CHIME, IHE international, the Personal Connected health Alliance (PCHA), and succeeded in building up capacities and getting recognition.

Our consultants are trained and certified by globally recognized organizations such as Himss, the IHE.

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ATH BUSINESS DEVELOPMENT

WASHINGTON DC US OFFICE
MAIN OFFICE AND HEAD QUARTER OF THE COMPANY

ALGERIA OPERATIONS OFFICE

Dedicated to business development in the on the Algerian Market and follow up of local customers

EUROPEAN OFFICE

In charge of business development in the EU building up connections and B to B relations with European based SDO's and Global health development organizations

TUNISIA OFFICE

North Africa Health Informatics Center of Excellence

Himss Analytics since 2016 "Certified Consultant" Organization
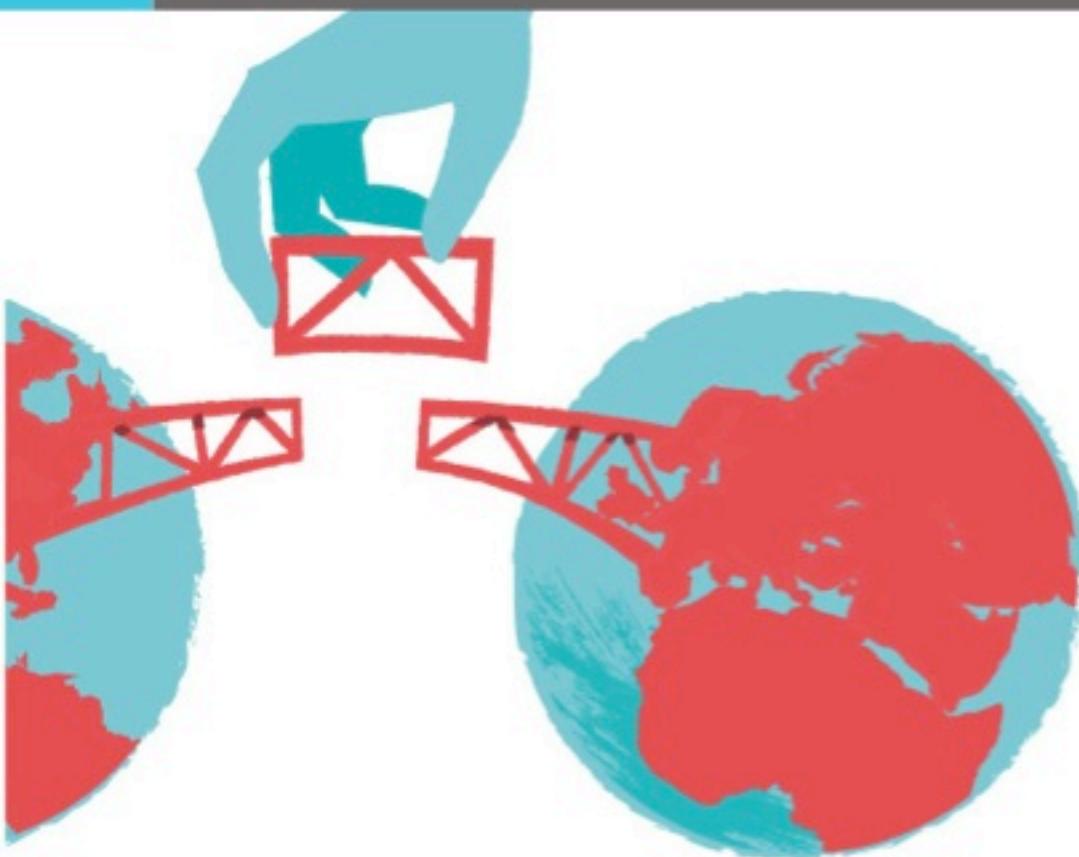
UAE OFFICE

In charge of business development in the middle East and Asia Region

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GAP IN THE HEALTHCARE IT INDUSTRY

- Difficulties ceating data models and patterns
- Lack of standards
- The deep interoperability
- The main challenges healthcare IT industry is facing
- Combining diffrent kinds of data from seve-ral resourcesnt technologies
- Cultural shift and resistance to change
- Interoperability between differe

HOW TO BRIDGE THE GAP

Certified to use only Internationally recognized Maturity models (HIMSS, JCI, DIAM and Interoperability maturity models)

Complete overview over any healthcare IT problematic. (HIE,EHR,VNA, Interoperability)

Strong references with international organizations (WHO, Global Digital health alliance ...) and governments

A team of Trained and certified global Consultants capable of adapting solutions to any environment

Interoperable and comprehensive way of handling healthcare IT projects

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OUR STRATEGY AND MISSION

FOR LIMCS

- Low-cost approach via Open-source platforms
- Localization of standards
- Integration of the health IT maturity models and the interoperability practices in the African markets

FOR MATURE MARKETS

- Educate customers to appropriately implement the standards data formats and uses cases

- Ensure comprehensive integrated approach of care (IHE Profiles, HL7, FHIR, DICOM,EHRCOM training and demonstration)

- Improve Usability of data to support direct care and research Health programs (Data management strategies breaking data silos, health cyber security

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OUR STRATEGY AND MISSION

FOR MATURE MARKETS

- Standardize and adopt Identity Management Approaches

- Ensure the stakeholders involvement from across the care continuum including patients and caregivers

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OUR SERVICE PORTFOLIO

HIMSS SERVICES

EMRAM

O-EMRAM

DIAM

AMAM

CERTIFIED CONSULTANT
PROGRAM

OTHER MATURITY MODELS SERVICES

INTEROPERABILITY MATURIT
MODELS

JCI PATIENT SAFET
MODELS

DIAL

INTEROPERABILITY AND COMPLIANCE WITH INTERNATIONAL STANDARDS

IHE

CONTINUA (PCHA)

HL7

OPEN SOURCE HEALTH SYSTEMS
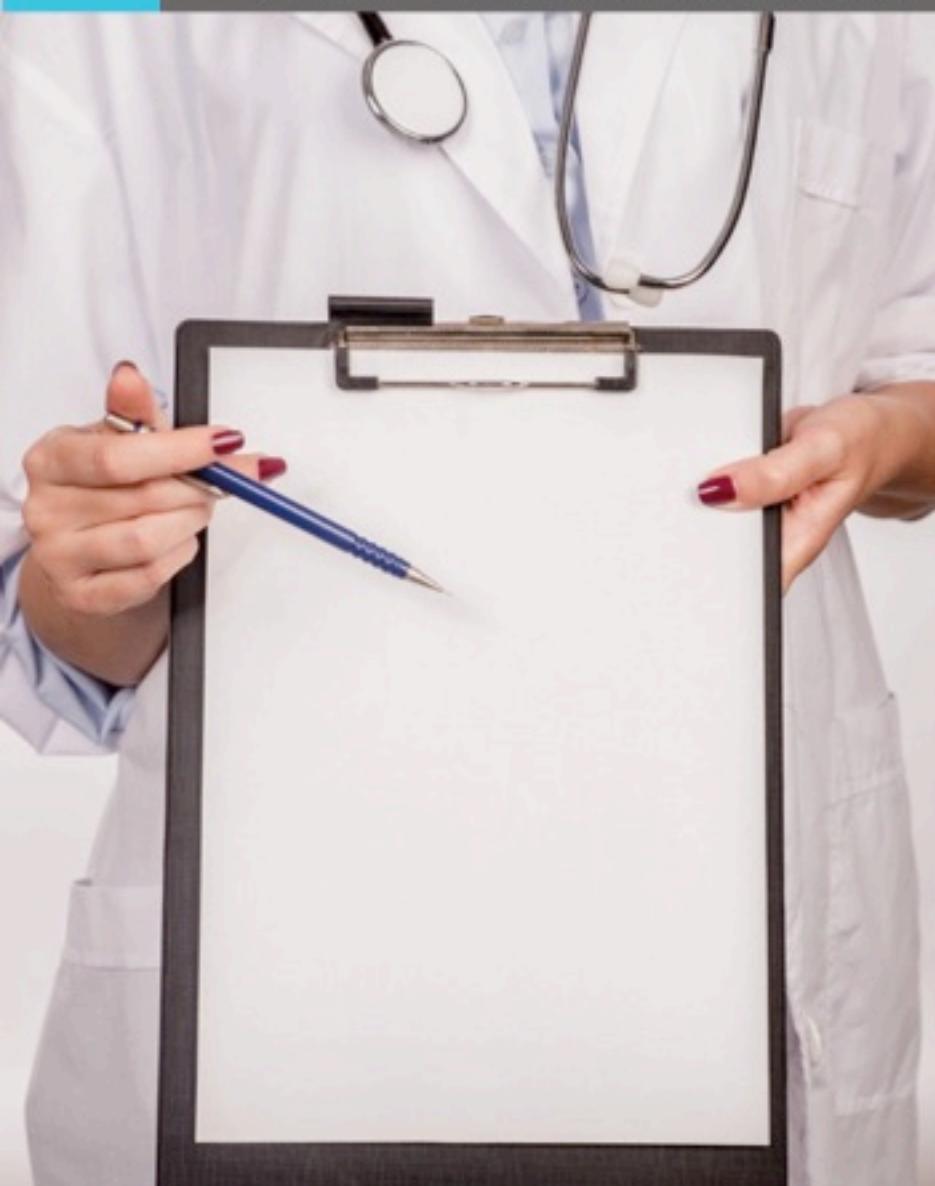
OPEN HIE

O-EMRAM

OPEN MRS

DCM4CHEE

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ATH CONSULTING KEY DIFFERENCIATORS

- ✚ Adapt the systems to the technology and not the technology to the system: We Build systems that are compliant to technical standards and frameworks and thrive towards their international certification.

- ✚ Interoperability maturity model or JCI from the early Design and implementation phase

- ✚ Our services are at the very early stages of the acquisition process and are technology/ vendor agnostic

We work in coordination with general consulting companies that manage the healthcare projects
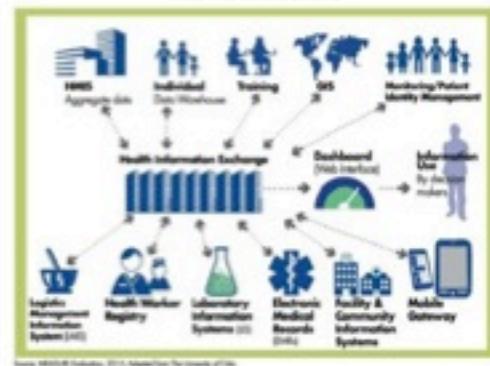
ATHConsulting

ATH CONSULTING KEY DIFFERENCIATORS

✚ Helping to avoid very heavy investment in specific interfaces. (VNA instead of PACS, multi site operations on shared health record indexes)

✚ Certified interoperable platform connecting health providers through an HIE and integrating their data with value added systems using analytics systems (HIMSS) and personalized medicine tools (AI).

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ONGOING PROJECTS

HIS Architecture

TUNISIA
- Telehealth
- Connected health
- HIS maturity

ALGERIA
- Certification by design

SUB-SAHARAN COUNTRIES
Telehealth

AFC INJURY AND ILLNESS SURVEILLANCE PROGRAM
-Surveillance software tool development

CERTIFIED

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CASE OF TUNISIA

TUNISIAN PROJECTS

National tele-radiology platform

The initiative is about transfering medical and radiological examinations from the regional hospital of Houcine Bouzaiene to Mohamed Kassab Institute of Orthopedics

National Tele-Obstetric Ultrasound Platform

The obstetric tele-echography initiative, which takes place at the maternity service at El Rabta Hospital and Mohamed Kassab Institute facilitates care continuity, limits patient transfer and strive against the lack of medical care

Assessing the maturity of Imaging systems (DIAM)

This iniative consists in the assistance of Mohamed kassab Institute of Orthopedics to develop its department of Radiology using the Digital Imaging Adoption Model (DIAM)

Medical Monitoring T-Shirt

The project aims to develop a remote health monitoring system for chronic disease managment

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BENEFITS FOR THE TUNISIAN MARKET

Medical Benefits

- provide qualified and skilled physicians in rural regions and optimize gynecological/ radiological ER situations

- Improve the intervention of the paramedical staff, in particular professional nurses, in the initial collection ofclinical data

- A sanitary and medical social collaboration between healthcare professionals

Social Benefits

- Reducing maternal and neonatal mortality rate and improve the quality of life of the for women and children

- Getting access to a high quality medical technologies

- Minimizing the isolation of regional hospitals

- Patient involvement in his/he wellbeing (T-shirt)

- Improve the quality of life of the solo radiologists/

Information Technology Benefits

- Interoperability of the Health Information system (HIS)

- standardize the Health Information exchange (HIE)

- Implementing the HIMSS Maturity Model: EMRAM / DIAM

- Videoconference equipment

- Telecommunication infrastructure

- Telemedicine service

- Tele-staff

Economic Benefits

- Reduce costs

- Shorten the time period of patient care

- Decrease the average duration of hospitalizations

- Reduce the necessity to go through excessive

THANK YOU FOR YOUR ATTENTION

FOR FURTHER INFORMATION
PLEASE CONTACT US AT

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TEL : +21698414156

[Mr. Helmi Ismail](#) is an e-health special advisor to the Health Minister in Tunisia. Similar to many other countries, Tunisia's healthcare system is facing major challenges and transformations like epidemiologic and demographic transitions, no man's land medical areas, budget constraints, etc. Mr. Ismail uses his decades of management experience, innovative approaches, and passion for e-Health to help solve these major challenges.

Mr. Ismail has prior led full life cycle implementation for many private companies such as Orange Group, Vodafone, OTE, and public administrations such as AP-HP, ARS Ile de France, etc. One of Mr. Ismail's main motivations through his activities is to promote the use of new technologies enhancing patient journey and the quality and efficiency of services delivered by public healthcare systems more globally.

He is a graduate of Telecom Paristech in Paris, France, has experience in over 14 countries, and is fluent in English, French, and Arabic.

00. E-Health
Agenda

01. What are the main challenges in healthcare sector?

02. How investing in "digital health" will help?

03. What are our national challenges in "e-Health"?

04. What are the main ongoing programs led by the Ministry of Health?
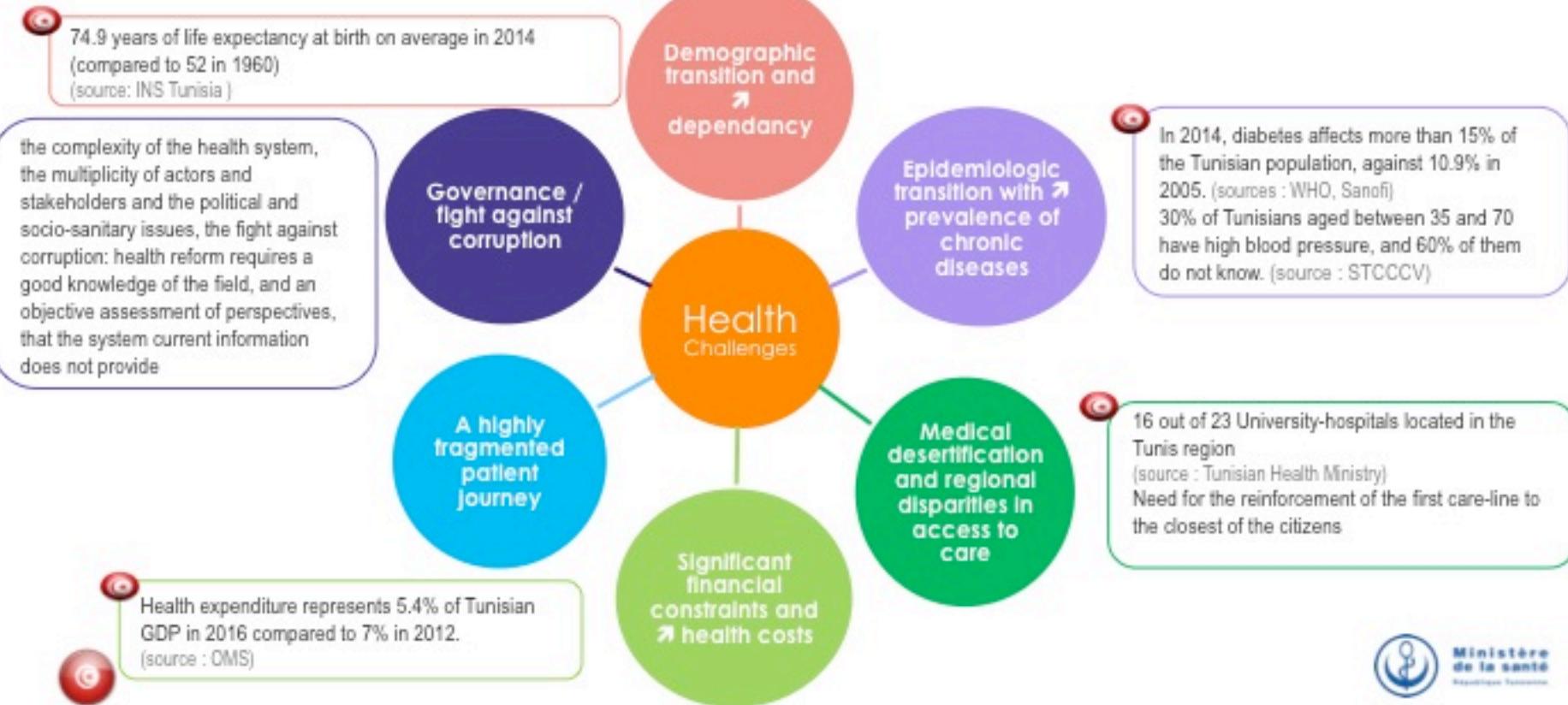
➢ Modernization of Health Information System

➢ Modernization of Hospital Information System

➢ Development of m-Health and tele-services

➢ Development of telemedicine for national and international purposes

➢ Big Data and innovative approaches for the management of the sector and the care of patients

05. How can we accelerate this projects?

Ministère
de la santé
République Tunisienne

01. What are the main challenges in healthcare sector?
Same challenges wordwide

74.9 years of life expectancy at birth on average in 2014 (compared to 52 in 1960) (source: INS Tunisia)

the complexity of the health system, the multiplicity of actors and stakeholders and the political and socio-sanitary issues, the fight against corruption: health reform requires a good knowledge of the field, and an objective assessment of perspectives, that the system current information does not provide

In 2014, diabetes affects more than 15% of the Tunisian population, against 10.9% in 2005. (sources : WHO, Sanofi) 30% of Tunisians aged between 35 and 70 have high blood pressure, and 60% of them do not know. (source : STCCCV)

16 out of 23 University-hospitals located in the Tunis region (source : Tunisian Health Ministry) Need for the reinforcement of the first care-line to the closest of the citizens

Health expenditure represents 5.4% of Tunisian GDP in 2016 compared to 7% in 2012. (source : OMS)

Health Challenges

- Demographic transition and ↗ dependancy
- Epidemiologic transition with ↗ prevalence of chronic diseases
- Governance / fight against corruption
- A highly fragmented patient journey
- Significant financial constraints and ↗ health costs
- Medical desertification and regional disparities in access to care

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02. What are the main challenges in healthcare sector?
How investing in "digital health" will help?

Digitalization offers many potentialities:

1. **Strengthening the Health sector's management (health monitoring / planning)**
2. **Optimizing the supply of care**
   1. improved access / quality & territorial rebalancing
   2. more integrated care path and coordination of care between stakeholders
   3. reinforcement of prevention
   4. limitation of hospitalizations
   5. limitation of redundant acts
3. **Tool for achieving good governance and the fight against corruption**

Ministère de la santé

03. What are the main challenges in healthcare sector?
What are our national challenges in "e-Health"?

1. **Challenges in terms of Information Systems:**
   "An integrated and comprehensive information system that supports evidence-based, timely, shareable and citizen-patient-centric decision making and its life-health pathways."

2. **Challenges in terms of health democracy**
   Relying on digital technology for "health care service with high quality for all citizens and everywhere"
   1. Improving quality and access to care in a context of unequal medical care distribution in the territory and increasing demand for care;
   2. The transformation of medical practices and the patient's relationship to his own health;
   3. The rationalization of health expenditures.

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04. e-Health

What are the main ongoing programs led by the Ministry of Health?

1. Modernization of Health Information System
2. Modernization of Hospital Information System
3. Development of m-Health and tele-services
4. Development of telemedicine for national and international purposes
5. Big Data and innovative approaches for the management of the sector and the care of patients

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Our Vision

Tele-services Tele-medicine Innivation

Tele-services

30

Quantified self (IoT)

Tele-medicine

Tele monotoring tele expertise,
Tele-assistance, Télé consulting

Innovation

Research
Personalized Medicine
(Big Data)
Decision Support Systems
Epidemiological surveillance, etc.

Health Information System

GP

Private Hospitals

Public Hospitals

Central Pharmacie

Payers(CNAM, insurances...)

Other healtcare stakeholders

Hospital Information System
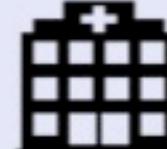
Patient Records

1st line of care

2nd line of care

3rd line of care

IT Infr@structure

M-Health

Accompanying measures :
Regulation, training, capacity support, driving of change, interoperability framework, Gouvernace

HIS Example: Achievements planned by 2020
Priority projects deployed on 12 sites

1	Hôpital Charles Nicolle	Tunis
2	Hôpital d'Enfants Bechir Hamza	Tunis
3	Institut Salah Azaiez	Tunis
4	Hopital la Rabta	Tunis
5	Institut de Neurologie	Tunis
6	Hôpital Abderrahmen Mami Ariana	Ariana
7	CHU Mongi Slim	Tunis (b)
8	Hopital Hédi Chaker Sfax	Sfax
9	Hopital Habib Bourguiba Sfax	Sfax
10	Hopital Fattouma Bourguiba	Monsatir
11	Hopital Taher Maamouri Nabeul	Nabeul
12	Hopital Habib Bougatfa Bizerte	Bizerte

HIS deployment priority projects:

DMI: Electronic Medical Record

DJINM: Daily Individual and Nominative Dispensing of Drugs

PACS: Picture Archiving & Communication System

AMN: Digitized Medical Records

12 major hospital sites in the first phase, representing 31% of total bed capacity in Tunisia
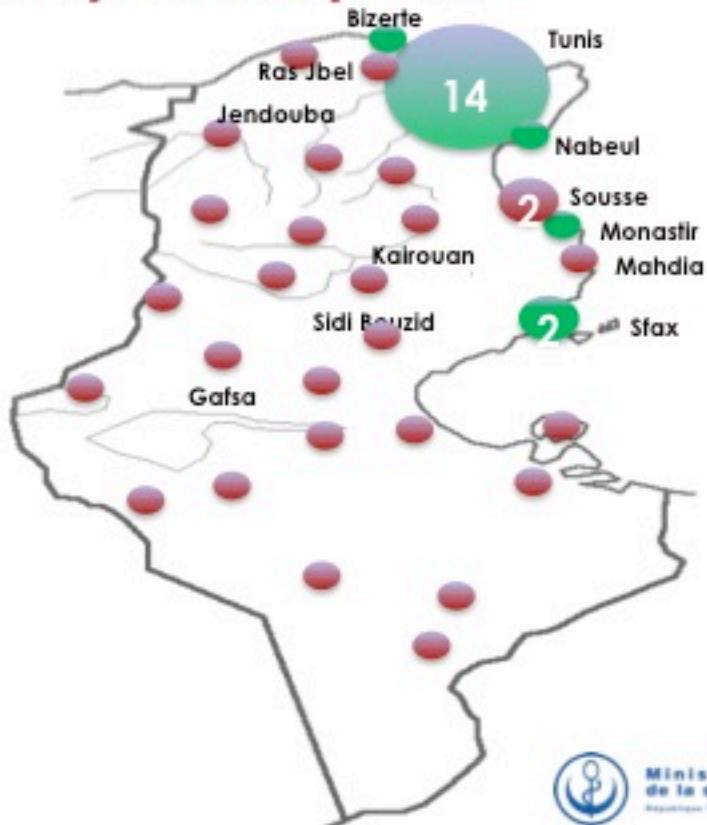
Strong expectation of health facilities on deployments

HIS Example: Achievements planned by 2025
Priority projects deployed on totality of Hospitals

1	Hôpital Charles Nicolle	Tunis
2	Hôpital d'Enfants Bechir Hamza	Tunis
3	Institut Salah Azaiez	Tunis
4	Institut National de Nutrition	Tunis
5	Hopital la Rabta	Tunis
6	Institut de Neurologie	Tunis
7	Hôpital Habib Thameur	Tunis
8	Hôpital Abderrahmen Mami Ariana	Ariana
9	Centre de Traumatologie Ben Arous	Ben Arous
10	Institut Mohamed Kassab	Manouba
11	Centre National de Maternité	Tunis
12	CHU Mongi Slim	Tunis (b)
13	Hopital Aziza Othmana	Tunis
14	Hopital Farhat Hached Sousse	Sousse
15	Hopital Sahloul Sousse	Sousse
16	Hopital Hédi Chaker Sfax	Sfax
17	Hopital Habib Bourguiba Sfax	Sfax
18	Hopital Fattouma Bourguiba	Monsatir
19	CHU Taher Sfar Mahdia	Mahdia
20	Hopital Taher Maamouri Nabeul	Nabeul
21	Hopital Habib Bougatffa Bizerte	Bizerte
22	Hopital Ibn Jazzar - Aghlabide	Kairouan
23	Hopital Régional de Sidi Bouzid	Sidi Bouzid
24	Hopital Régional Jendouba	Jendouba
25	HR Gafsa	Gafsa
26	HC Ras Jbel	Ras Jbel

Example Telemedicine: Achievements planned for 2020
5 Territorial Telemedicine Initiatives Deployed

1   **Tele cardiology** – UH Hedi Chaker

2   **Teleperinatality du Sud** – HU Hedi Chaker

3   **First Aid and Emergency Response in Cardiology** – Nabeul

4   **Obstetric telechography -** Maternity and Neonatology Center of Tunis

5   **Teleradiologie** – Mohamed Kassab Hospital of orthopedics

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A better health service for All

Health Ministry
Tunisian Republic

Ministère
de la santé
République Tunisienne

Carl Fourie is a Senior Programme Coordinator at Jembi Health Systems and has been involved in a range of digital health intervention projects for low resource settings. Being with Jembi from inception, Carl has worked on many of the projects including the Rwanda Health Information Exchange, the MomConnect project that is the national pregnancy registry project of South Africa and various other projects and community engagements to name a few.

Carl currently leads Jembi's OpenHIE community engagement and oversees the Interoperability Layer and Shared Health Record communities as well as plays a role in the OpenHIE leadership and architecture community. He is passionate about solving problems in low resource settings and building capacity and knowledge around appropriate health information system intervention in these settings.

Jembi Health Systems
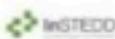
Carl Fourie
Senior Programme coordinator
www.Jembi.org | carl.fourie@jembi.org

jembi
health systems NPC

Who we are

- Jembi Health Systems (Jembi) is an African-based not-for-profit company based in South Africa that started in 2009.
- Jembi was spun out of MRC in 2008 and is currently an MRC Collaborating Centre in Digital Health Innovation
- Jembi is one of the leading specialists in health information systems in Africa
- Provides national scale implementation support for projects in South Africa, Mozambique, Rwanda and Zambia.
- Head Office is based in Cape Town with project/satellite offices in Maputo, Kigali and Lusaka.

The Jembi Team

- Programmes and implementation teams
  - Programme managers, implementation managers and coordinators experiences in digital health programmes, open source community convening and implementation design and execution.
- Software Engineering and Integration
  - 20 Software engineers focused on Health Information System development
  - Efficient development pipeline
- Solutions Design
  - Solutions architects with decades of experience in Interoperability and health standards
- Product Development
  - System, Data and Business analysts and Quality assurance team members

Vision:
"A world in which health systems and information advance global health"

Mission:
We are an African non-profit organisation advancing global health, by **developing** and **implementing sustainable information systems**, growing **partnerships**, and **building local capacity**, with focus on developing countries.

Values
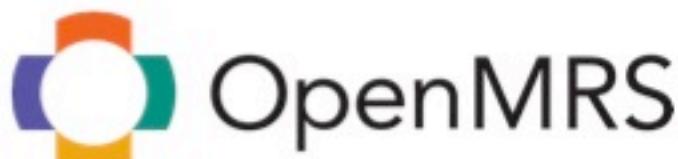
We are *innovative and impactful*	We are *independent and impartial*	We respect *local capacity* and expectations	We value our culture of *unity, trust and respect*	We value *good governance*
We are a _center of excellence_	We are _honest brokers_	We _respect country vision_ and _ownership_	We invest in people and _build sustainable capacity_	We are _responsible stewards_ of our resources: human, environmental and financial

Programmes and Projects

A high-level overview of some of the relevant projects Jembi has worked on in the past
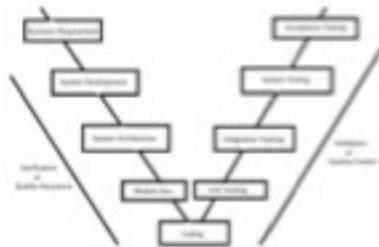
OpenMRS and Bahmni

- Jembi, through our CEO, is a founding member of OpenMRS and begun the implementers community.
- Been part of the OpenMRS leadership group and community for over 10 years.
- Part of the Bahmni coalition (formed 2017) that is responsible for driving the development roadmap and strategic vision.
- Conducted and provided OpenMRS and Bahmni training to regional NGOs and donor groups.
- Actively developed on OpenMRS and implemented in a range of projects
  - Rwanda Health Information Exchange
  - Mozambique POC rollout
  - PIH Technical support
  - MSH Rwanda OpenMRS support

Blood Safety Information System (BSIS)
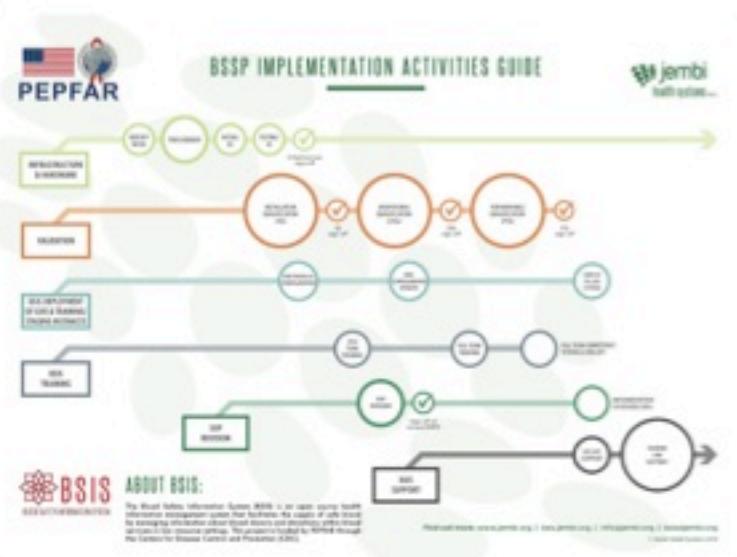
- BSIS is designed as a fit-for-purpose information system for use specifically in resource-constrained blood services.
- The BSIS solution records, tracks and reports information across the core business areas of a blood service organisation, from the point of donor registration through to the distribution of safe, labelled blood and blood
- Designed to promote the Africa Society for Blood Transfusion (AfSBT) quality standards for blood processing.
- Open Source and **product** focused.
- Built following a "**Quality first**" approach with strong focus on validation and product management.

BSSP Implementations

Lesotho Ethiopia Ghana Cameroon Zambia
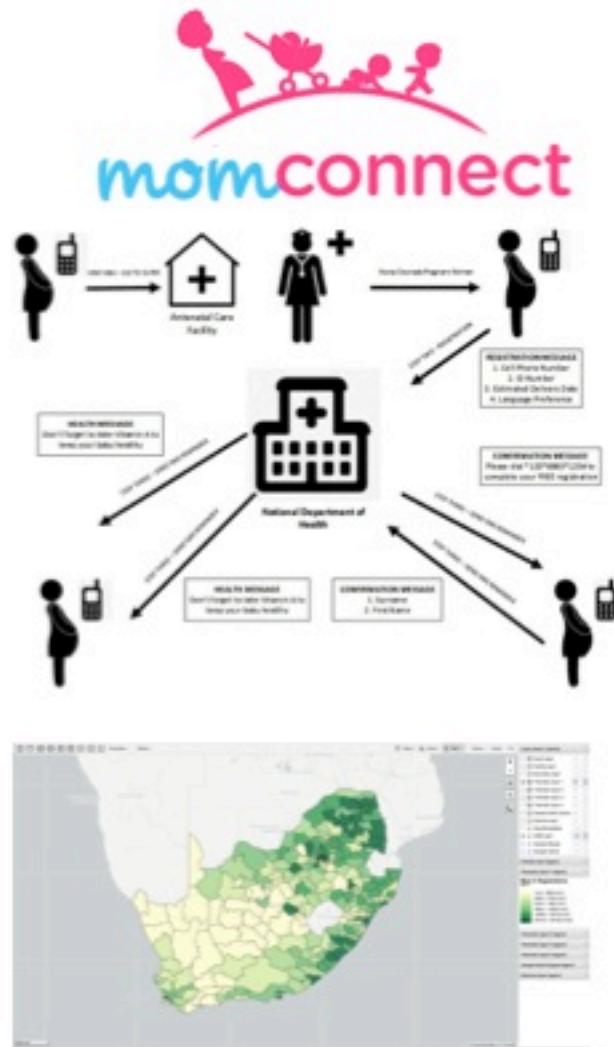
- The implementation strategy for the BSIS Software.
- Focuses on a whole system approach to software implementation that acknowledges the interconnection between policy, practice and technology
- Core areas of the strategy
  - Environment;
  - Process;
  - Technology;
  - Capacity building and Sustainability.
- Follows industry standards for laboratory and blood services implementations of technology: *IQ, OQ, PQ*
  - Infrastructure and Installation Qualification (**IQ**)
  - Operational Qualification (**OQ**)
 - Performance Qualification (**PQ**)
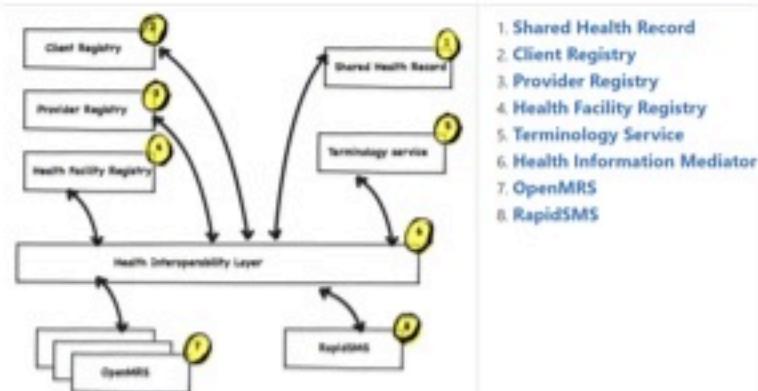
MomConnect

- MomConnect allows mothers to register to stage-based SMS messages to provide them with information about their pregnancy.

- Mothers can also opt-in to baby messaging after giving birth.

- Jembi has been responsible for the interoperability architecture and exchange services.

- Working with partners on the project that include:
  - South African NDoH
 - CSIR, Praekelt Foundation, HISP South Africa

Rwanda Health Information Exchange

Carte sanitaire du District de Rwamagana
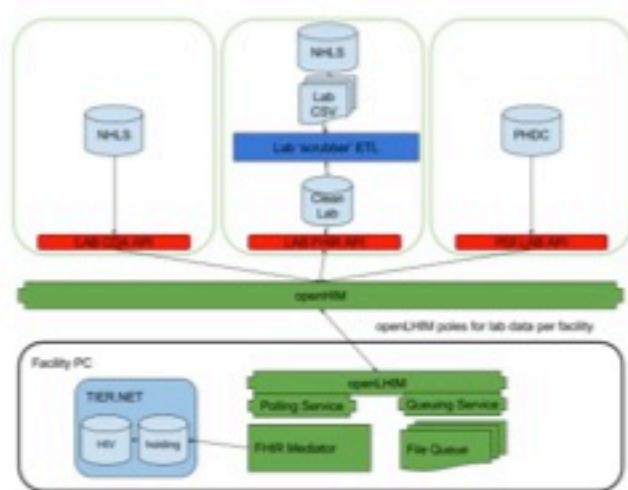
- Implemented Africa's first Open Source Health Information Exchange to support a ANC use case in Rwanda.
- Lead the implementation team in deploying the solution in 15 health centers including a district hospital.
- Designed to work in an asynchronous environment and exchange information to the central servers.
- Leveraged existing community health care workers programmes
- Provided initial links to DHIS for reporting and facility management
- Software:
  - OpenMRS
  - RHIE (foundation of OpenHIE)

1. Shared Health Record
2. Client Registry
3. Provider Registry
4. Health Facility Registry
5. Terminology Service
6. Health Information Mediator
7. OpenMRS
8. RapidSMS

African Health Information Exchange

- Bill and Melinda Gates Foundation funded 3 year grant
- Build interoperability and HIE in South Africa and package for use across the continent
- Partnered with NDoH, NHLS, CSIR, UCT CIDER
- 3 Main projects
  - Linking NHLS HIV and TB Lab results with TIER.NET
  - Strengthening Provincial HIE and interoperability
  - Linking Community data (CHWs) into the Provincial HIE and closing up and down referral loops
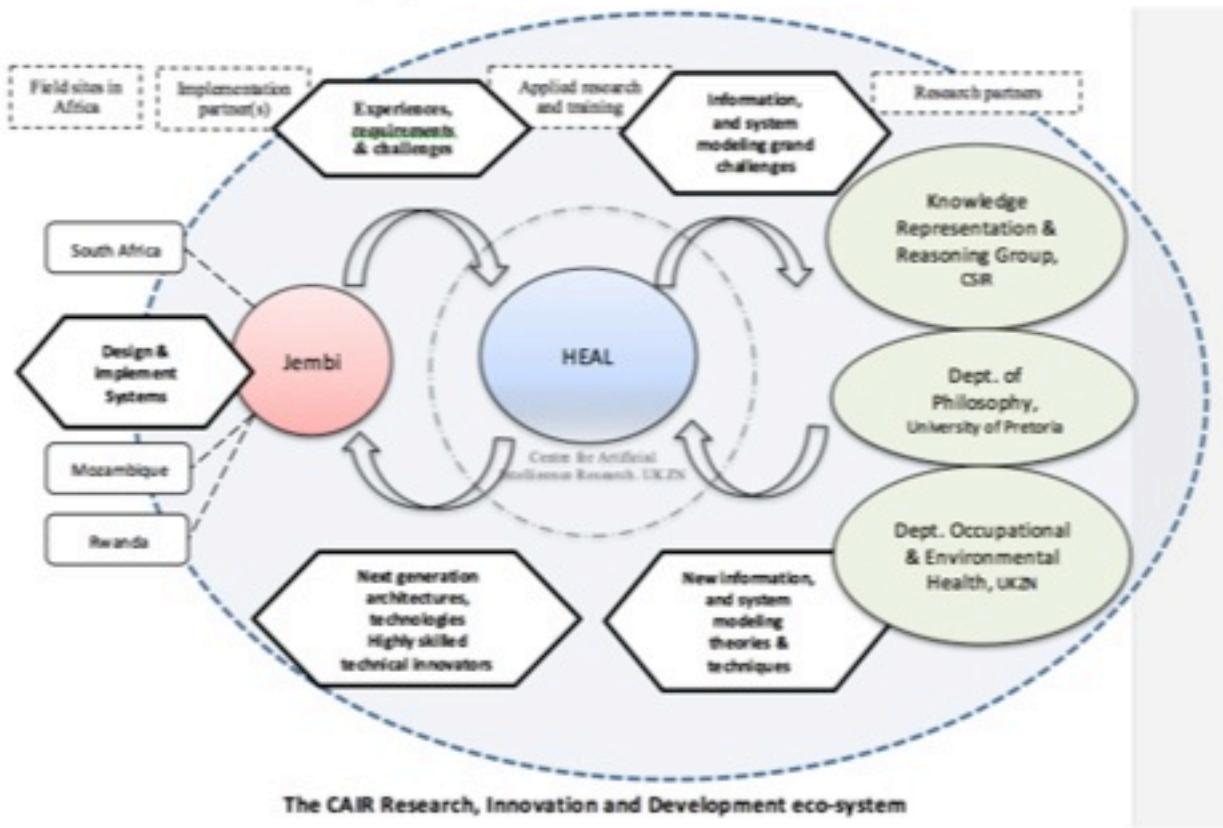
OpenHIE (www.ohie.org)

- OpenHIE is both a set of communities that supports interoperability by creating a reusable architectural framework that introduces a service oriented approach, leverages health information standards, enables flexible implementation by country partners, and supports interchangeability of individual components.
- Jembi curates the core interoperability layer and Shared health record communities as well as has the reference technologies for both (the *OpenHIM* and *HEARTH* respectively)
- We lead the Implementers network and are core participants in the architecture community that is responsible for interoperability workflows and design.

HeAL Innovation Approach

The CAIR Research, Innovation and Development eco-system

Q&A

Help us to better understand to better serve you