



E-Health

Scaling up open source health service
management – The importance of partnerships

Introduction : Going digital in health development programs - Belgian D4D strategy

1

Better use of data and information

The Belgian development cooperation invests in the tools and policies needed to use real-time data to produce actionable insights for development actors, and thus to increase their impact. Equal attention is given to 'open data'.

2

Digital for inclusive societies

The Belgian development cooperation promotes digitalization to optimize democratic rights and equal access to basic services such as health and education.

3

Digital for inclusive and sustainable economic growth

In line with its policy priority to promote inclusive and sustainable economic growth, the Belgian development cooperation supports interventions that turn digitalization into more employment and better social protection.

Part 1 : 5+1 eHealth : what ?

1. Country

2. Health facility

3. Health professional

4. Community

5. Patient

+ 1 Digital skills/ Capacity building

Country level

- **Quality information is crucial.** Enabel is prepping the partner countries for the information era: on-line & on-time, with **DHIS2, a web-based aggregate health information system**, including comprehensive dashboards and relevant level-specific information.
- Enabel supports **open access to data** and information for all, with respect for privacy and individuals.

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Health facility

- This level includes the **health centres**, the **clinics**, the **hospitals** but also the health **insurers**.
- Digital makes **management** better and faster, improves patient **administration**, enhances **performance** and accountability
- Enabel, with business and academic partners, works on hospital information systems in:
 - ✓ **Senegal**: health insurance system with e-management of individual members
 - ✓ **Burundi**: e-management & maintenance of 700+ health facilities.
 - ✓ **Rwanda**: Kigali e-urban hospital network.

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Health professional

- Digital makes it possible for nurses, doctors and health workers to **easily collect data** and **keep patient records in a standardised way**. Tablets and mobile devices can improve health care delivery, even in remote areas.
- Enabel develops **mobile health care monitoring** in several countries, with a focus on quality control

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Community

- The community is an **essential player** in the health system. Community members have a seat in steering committees of health facilities and districts, they participate directly and indirectly in the financing of the communities' health.
- Technologies such as SMS and WhatsApp can be efficient for **feedback**, or for **awareness-raising** and **early warning community systems** (disasters, epidemics)
- In the context of **Performance-Based Financing**, we develop **mobile quality control** on health services to be used by community associations. This gives reliable feedback on the patients' experiences and outcomes.

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Patient

- The **end-user** of the health system. Our developments must bring added value for the patient.
- Enabel works on:
 - ✓ **comprehensive patient applications**
 - ✓ **mobile money transfers** for subscriptions to health insurance
 - ✓ **warning text messages** on routine controls during pregnancy
 - ✓ **health information** on mobile phones
 - ✓ health **applications** monitoring physical activity
 - ✓ ...

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+ 1 Digital skills

- Capacity building & knowledge sharing are powerful enablers; Enabel works on tutorials, on-line courses, distance learning, virtual schools, e-portals for training and teaching purposes.
- ✓ **Blended learning** is facing a bright future (example the blended eSSR and eSSP courses in Guinée, the SRHR tutorials, ...) : <https://www.bodyandrights.be/login>
- ✓ **Ikirezi application** = a software tool offering computer-assisted clinical decision support to health professionals : <https://www.ikirezi.org/en/consultations>
- ✓ **SPT application** = a software offering computer-assisted therapeutical decision support : <https://play.google.com/store/apps/details?id=be.enabel.spt>

Part 2 : 5+1 eHealth : where ?

1. Burundi, DRC,
Rwanda, Uganda;
2. Bénin, Burkina Faso,
Guinée, Sénégal,
Niger, Mali, ...

✓ Burundi :

- ✓ 15 hospitals digitalized
- ✓ action research on digital registers,
- ✓ digital decision making (Ikirezi, SPT,...) in 15 hospitals and 115 health centers
- ✓ electronic inventory and maintenance management for biomedical equipment and infrastructure (GMAO)
- ✓ national datacenter for the health sector
- ✓ national e-health strategic plan (PNDIS)

✓ Rwanda :

- ✓ 4 hospitals digitalized, integration in urban hospital network

✓ DRC:

- ✓ 1 Provincial administration, 2 districts fully digitalized
- ✓ national e-health strategic plan (PNDIS)

Part 3 : 5+1 eHealth : how ?

Partnership with :

1. Academic actors :
VUB, ITM
2. Private sector
3. Partner institutes

✓ **Academic actors :**

- ✓ Strategic development
- ✓ Scientific validation
- ✓ Piloting

✓ **Private Sector:**

- ✓ Technology
- ✓ Scaling up (implementation)

✓ **Partner institutes:**

- ✓ Gaps analysis
- ✓ Strategic framing, normative settings

✓ **Enabel:**

- ✓ Building multi-actor partnership in response to priority needs set by government partner
- ✓ Coordinate the partnership

Part 4 : why go for free and open source software (FOSS) ?

1. No **license fees**. Lower total cost of ownership
2. No **vendor lock-in**
3. **Adaptable** to local functional & organizational needs
4. Marginal cost to develop local **FOSS development skills**
5. Easy sharing and **peer-evaluation**
6. Fast **parallel developments**
7. Many **mature** applications

- ✓ **DHIS2** *health data warehouse*
- ✓ **OpenClinic GA** *hospital information management system*
- ✓ **OpenClinic PiBox** *health center information management system*
- ✓ **GMAO** *health assets inventory and maintenance management*
- ✓ **SPT** *therapeutic decision support for health centers*
- ✓ **Ikirezi** *diagnostic decision support for hospitals*
- ✓ **OpenRBF** *results based financing management*
- ✓ **Weasis** *medical imaging viewer*
- ✓ **DCM4CHE** *medical imaging archiving solution*

FOSS use case 1: OpenClinic GA in Burundi

1. **Fully integrated hospital information management system** *(Patient administration, financial management, medical record, nursing record, lab, pharmacy, imaging, logistics, human resources, asset management, statistics, reporting)*
2. **Medical decision support** *(diagnostics, therapeutics, clinical guidelines compliance)*
3. **Interfaced with other solutions of the Burundian e-health ecosystem** *(Health insurance (MFP), DHIS2, RBF, Labware lab information management, Global Health Barometer, WHO-Net)*
4. **Important increase in hospital income observed (+30% up to + 95%)** *(Sustainability factor, ROI 1 to 3 years)*
5. **Supporting actions** *(Solar energy, extensive training programs, adaptation of MoH quality of care M&E)*

- ✓ **Multiplicator effect**
 - ✓ Financing of 15 hospitals
 - ✓ 10 other hospitals joined with own funding
 - ✓ More than 1.3 million hospital patient records managed
- ✓ **Local IT sector developpment**
 - ✓ Academic training programs
 - ✓ Creation of local health-IT operators
- ✓ **Digitalization has become mandatory for public hospitals (MoH decision)**
- ✓ **Identification of medical knowledge gaps**

FOSS use case 2: SPT in Burundi

1. **Digitalization of 48 national therapeutic guidelines for first level health facilities** (*Stratégies Plainte-Traitement*)
2. **Adapted to local context** (*critical: Digital literacy, energy, GSM & internet coverage, IT support availability*)
3. **2 editions: local micro-webserver with tablet computers + Android app for individual use**
4. **Important improvement observed in clinical decision making during test phase** (*compared to using paper based guidelines or without guidelines*)
5. **Formalizing of patient referrals based on objective scientific criteria**

- ✓ **Interfaced with medical record management solutions**
 - ✓ OpenClinic PiBox
 - ✓ OpenClinic GA
- ✓ **Web server edition for longitudinal patient follow-up**
- ✓ **Low energy**
 - ✓ Runs on mainstream powerbank with small solar panel
 - ✓ Server draws less than 3 watt
- ✓ **Low cost implementation in 115 health centers**
 - ✓ < 1.500 EUR per health center

Part 5 : Lessons learned and challenges

- Integrated (holistic) approaches needed
 - Added value of MS partnerships
 - Beneficiaries in driver seat (steering committees) & user-centeredness
 - Digitalization leverages a better environment
 - Quality of care monitoring
- At times resistance to change
 - Evidences for better health outcomes not yet well documented
 - National strategies often missing. Essential for strategic planning and coordination / harmonization eHealth sector
 - eHealth directorate/agency should be strengthened
 - Innovative financing instruments are very valuable



Belgian development agency

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