HISP – Health Information Systems Program
DHIS – District Health information Software
1994 – 2007 – Ongoing …
Open Source: application sw – technologies

Background South Africa:
- Started 1994/95 as a RDP project –funded by NORAD
  (the longest lasting? – At least the widest spread!)
- 4 pilot districts in Cape Town: Information systems to support post-apartheid decentralised health structures (RDP goals)
- Base: Universities of Western cape & Cape Town & Western Cape Dept. of Health

Status today
- National standard in South Africa
- Being spread in Sub-Saharan Africa & Asia
South Africa 1994 /95
– Problems & challenges:

Apartheid Legacy:
• **Inequity** in Health status & Health services provision
• **Fragmentation:**
  – Until 1994: 14 Departments of health at central level
    – ‘National’ Department;
    – 10 ‘Black homelands’ & self-governed states
    – + 4 ‘independent’ provinces & 400 local authorities
  – Neighbouring clinics / health centres / hospital reporting to different authorities - no co-ordination
South Africa 1994 /95
– Problems & challenges (2):

• **Inequity** between blacks & whites, rural & urban, urban & “peri-urban”, former “homelands”, etc.

• “**Equity**” main target
  – But how to know whether targets are achieved?

• **Need standard data from across the country on**
  – Health status & Health services provision

• **Problem:** No coordinated data system – no standards

• HISP key actor in developing the new unified Health Information System in South Africa
Developing District-based Health Information System in South Africa

**Research and development**

- **HISP approach:** Local use of information; Maximise end-user control; Local empowerment & bottom-up design and system development
- **Focus on**
  1) standardisation of primary health care data &
  2) development of database software to support a ‘flexible’ hierarchy of primary health care data
- **1998/99:** implemented District database software and ‘processes’ in two provinces - Eastern & Western Cape
- **1999/2000:** Becomes National Standard - being rolled out to all provinces and districts
Apartheid legacy: a fragmented and top down health structure as reflected and ‘reproduced’ every day by the information systems
Information infrastructure - Installed base
Information management at district level
- From fragmentation to integration; A process of standardisation

A) Pre-apartheid vertical and fragmented structure in Atlantis (simplified)
- no local use & analysis of data
-172 data collecting forms in 3 gov. structures
+ multiple health programs (immunisation, TB, etc.)
-Data overlaps and gaps and inconsistencies
-Data handling takes up to 40% of nurses’ time!

B) “Ideal” integrated district model
-South African HISP approach was to create a common “minimum” data set, “one sheet of paper” covering key Issues, addressing key indicators
- This seemingly logical approach has Worked in NONE of the other HISP countries! (why?)
A Hierarchy of (data) standards as implemented in South Africa:

- Balancing national need for **standards and innovation** & local need for **flexibility**
- Structure Supported by the HISP software:
  - flexibility, integration between & within levels
  - Allowing for “glocal” (global/local) prototyping because all levels have freedom to define their own standards as long as they adhere to the standards of the level above (core data set)
DHIS – a flexible “generic” health information software

**DHIS could quickly adapt to**

- Changes in data and indicator sets
- Differences between provinces
  - 1998-Western & Eastern Cape: different data sets – same DHIS
- And changes in the district structure

Changes were the only constant in these days …

Since DHIS could be adapted to the very different circumstances within South Africa – and changes over time:

- DHIS could be adapted also to other countries

And DHIS spread to other countries from about 1999/2000:

Mozambique, India, Mongolia, Malawi, Tanzania, Cuba, Ethiopia, Nigeria, Vietnam, Zanzibar, Zambia, Nigeria, Namibia, ….

- And Now: DHIS 2 in India – big country & scale
South-south-north Research network: Global Software Development & Health Information Systems Strengthening

Linking Africa-Europe-Asia
Publications + Masters & PhD programs
HISP & BEANISH: “South – South – North” Network

National Health Information Systems
Development
District focus, indicator & data sets

“Global” & local software development
Shared software, resources knowledge building & support

Capacity building
Educational programs, Research
PhD & Masters Programs, continuous education, short courses, training,

South Africa
Nigeria
Malawi
Mozambique
Ethiopia
Tanzania
India
Vietnam
Botswana
Mali

Others

Europe's Information Society
### DHIS

**– the software /information system research frontier**

DHIS as a generic software to be adapted to users needs through
- Prototyping
- User participation

Thereby part of the “participatory design” approach:
- Design and develop Information systems in cooperation with users – and to serve their needs
- IT people needs to learn about the user domain (health) and users need to learn IT – and both parties need to learn how IT can satisfy the needs of the users – through cooperation
- Part of global research agenda
- Born out of Union activists in Scandinavia & Norway– and thereby the Informatics /information systems research component:
  - Phd program
  - Masters programs
DHIS-research agenda (2)
– combining Health & Information systems research

The most original & crucial part of DHIS – HISP:
Combination of
• Public Health research &
• Information systems / software research

What can the two fields learn from DHIS/HISP & vice versa?
• How to combine “order” (standards) with change /flexibility at local & global levels
  – To change with the needs of the health services
• Integration of data & indicator sets across health programs
• How to develop effective “data warehouses” for all essential data and indicators in a country – or in a district

Other countries – as Zanzibar, Ethiopia and India – have used DHIS more directly as a data warehouse
Application OSS: the problem of being both specific and general

- Applications: supporting specific needs, customization & interaction with end-users crucial
  - From specific to more general usage (e.g. HISP)
- Tools for building applications: general for wider areas or particular purposes (e.g. Java platform)
- Databases (e.g. MySQL)
- General tools for very specific purposes; e.g. web portals, logging libraries, XML parsers …
- Operating systems (Linux)

“Society”/organisations
End-users
Not (so) standardised

Hardware, networks
Standardised
Global SW development; Outsourcing, off-shoring, shared

“Society”/organisations
End-users
Not (so) standardised

Difficult to specify & out-source

- End-user application SW; in principle difficult
  - DHIS?
    - Core & generic modules shared;
- Tools for building applications: general for wider areas or particular purposes (e.g. Java platform)
- Databases (e.g. MySQL)
- General tools for very specific purposes; e.g. web portals, logging libraries, XML parsers …
- Operating systems (Linux) - &/or Call centres! IKEA!
  (same specification)

“Easy” to specify & out-source

Hardware, networks
Standardised
DHIS – dependent on CONTEXT – Outsource?

A district:

- Local Government
- Environmental Health
- Immunisation program (EPI)
- NGO
- School Health
- Clinic

‘Action’

‘Community’

‘Action’

‘Community’

Outsource Specification?

District

management

team

District
database

Information

officer

Register

report

Nurse

Manager

Information

officer

Register

Patients

‘Action’

DHIS – dependent on CONTEXT – Outsource?
DHIS — Remaining at the cutting edge!?

— web and Open Source

- MS Office was available everywhere in the health services when DHIS started – that’s why Access/MS Office became the platform
- Today: Internet is spreading in Africa and Asia

AND

- Many countries have policies on Open Source

DHIS 2 addresses this by being
- Web-enabled (and stand-alone)
- Fully Open Source: based on Java tools/frameworks
- Database and Operating system independent (Oracle/Mysql/Access, Windows/Linux)

Challenges:
- Not much knowledge and experience with the programming tools in Africa/Asia – so far most done by Oslo
- But Vietnam, India and Ethiopia picking up
HISP – Development & migration strategy and platforms (2)

Extensive prototyping leading to “onion” like structure (DHIS 1.4)
- Major “clean-up” of data structure, indicator engine etc.
in new version (now) – core module still same platform

Gradual web-enabling & fully OSS platform (Migration from MS-OSS)
- New modules web-enabled (web portal & (pivot) report generator)
- & fully OSS (Data Dictionary)

Global re-implementation/development on OSS platform
- Parallel multi-country project to re-develop using Java frameworks
- Global collaboration requires strict modular design & well defined interfaces & Shared representations & tools
- Technical framework for collaboration (Wiki & bandwidth!)
- OSS development platform more complex than commercial! (combine pieces)
Outsourcing — web and Open Source

Challenges for global distributed development

- Context of use - & user needs differ; how to get useful &stable specifications – and shared understanding?
- Knowledge about SW tools & frameworks across countries
- Collaborate on development – between countries

Example India:
- More customization & implementation than “core” development
- Need team of developers engaged both
  - With users
  - Global network
Free & Open Source SW development in international network – many challenges!

- “Outsourcing”: share *one* specification which is produced by a dominant partner
- Shared *application* SW development more complex
  - Different contexts of use
  - Different languages, realities and representations
- Need to share and agree to what is common /global AND
- Find ways to accommodate the differences and the specifics

Data Structure
- hierarchy of standards
- organisational structure

Shared core

Add. Modules
(may be shared) &
Local adaptations