Creating an ICT Portfolio at PATH

Richard Anderson

PATH

• Seattle based NGO working in health technologies
• Founded 1977
  – Now working in 70 countries
• Program for Appropriate Technology in Health

PATH focus

• Solutions for emerging and epidemic diseases, like AIDS, tuberculosis, and malaria.
• Health technologies designed for low-resource settings, by the people who will use them.
• Safer childbirth and healthy children.
• Health equity for women, among the world’s most vulnerable—and influential—populations.
• The basic protection of vaccines for women and children around the world.

Path Mission Statement

Our mission is to improve the health of people around the world by:
  – Advancing technologies
  – Strengthening systems
  – Encouraging healthy behaviors

How is PATH organized? Global Health projects managed either by global programs or by field programs.

Where does PATH work?: PATH has over 800 staff located in 19 countries and have worked in over 70 countries
Who funds PATH’s projects? Funding largely comes from private sector and ranges across topics.

2008 Revenue: $187M
- Emerging & epidemic diseases: 26.6%
- Vaccines & Immunizations: 32.7%
- Health Technologies: 12%
- Maternal and Child Health: 9.5%
- Reproductive Health: 19.2%

A Whole Systems Approach
The Vision
- Innovative and appropriate technologies, systems, and practices could overcome constraints and enable opportunities for better primary health care.

The Approach
- Needs assessment
- Analysis of prevailing technologies
- Technology identification/development/adaptation
- Assessment/validation
- Technology transfer
- Global introduction
- Evaluation

The Design Challenge
- By definition, what PATH works on is “economically challenged” technology
- Design challenges are often due to cost constraints
- Rugged conditions in how the device will be used also creates challenges

Technology Track Record
- 85 technologies developed with or transferred to commercial partners
  - 10 now in use in > 25 developing countries, > Unit sales in the billions
  - 26 commercialized; 7 distributed worldwide
- > 100 private sector partners
- > 50 public sector partners

TS - Primary areas of focus
- Immunization & vaccine technologies
- Diagnostic tests for diseases
- Reproductive health technologies
- Maternal & child health technologies
- Nutrition technologies
- Health Management Information Systems

Safe and Effective Immunization
- Safe Vaccine
- Safe Injection
- Safe disposal
**HEATmarker™**
Vaccine vial monitors

Illustration of HEATmarker™ Color Change

- Preserved vial: Shelf life. Bottle sealed, label indicates date is not passed, skip the vaccine.
- Preserved vial: Vial due to be removed goes to the vaccinator, read the label:
  - The label indicates the vaccine is good for use, go to the next stage.
  - The label indicates the vaccine is bad for use, skip the vaccine.

**Auto Disable Syringes**

More than 5.4 billion distributed by 2005
Leads to medical waste problems

**Uniject™**
Pre-filled, single dose, auto-disable injection system

**Removing the Danger of Contaminated Needles**

- Needle removal can (‘popper’)
- For luer-slip needles
- Reduces volume of ‘sharps’ waste

**Clean Delivery Kit**

**Expanding contraceptive choice**

**Reducing Sexually Transmitted Infections**

**Safe Pregnancy and Childbirth**

**Early Detection of Cancer**

**Improving Reproductive Health**

**Expanding contraceptive choice**

**Safe Pregnancy and Childbirth**

**Removing the Danger of Contaminated Needles**

**Clean Delivery Kit**
IC Rapid Strip Test
• Falciparum Malaria
• Syphilis
• Chlamydia
• Gonorrhea
• Tuberculosis
• Hepatitis B
• Pregnancy

HMIS Group
• Newly formed group
• Developing expertise applying ICT to global health challenges
• Major project: Rockefeller Foundation funding for Software Requirements and Architecture work

HMIS project types
• Health Information Systems and Architecture
  – Large scale and broad impact
  – Target national level for impact
• Innovative health products using ICT
  – Projects with direct goals
• Supporting PATH programs with new ICT technologies
  – Enabling other programs to deliver ICT solutions

HMIS Projects
• CRDM
  – Rockefeller
• Smart Connect
  – RMS 1, RMS 2
• TB Management in Tanzania
  – RMS 1 (completed), RMS 2, Path Fund (Matt Steele), RMS 2 (in submission)
• mHealth Prequalification
  – RMS 1 (in submission)
• CCEM
  – Ongoing funding from HealthTech, RMS 1 (in submission)
• Handheld CCEM
  – Unfunded
• SARA
  – Crosscutting

Collaborative Requirements Development Methodology
• Systems design for global health applications

CRDM as Applied to Logistics Management
Smart Connect

- Develop a low cost device to bring a “digital dial tone” to rural health clinics

Mobile support for TB Management

- Improve management of TB cases with mobile devices
- Phase 1: Develop mobile application to support TB case management
  - Supervision of community health worker and active case finding
  - Focus on “Sputum fixer” to improve case identification
- Phase 2: Prototype national scale system for TB management
  - Integrate system with national registries
  - Develop systems requirement for full scale system

mHealth Pre-qualification

- Evaluate opportunities for mHealth technologies across PATH programs
  - Inventory current projects, create taxonomy of problem types and technologies
  - Develop pre-qualification requirements for mHealth projects
- Analysis of UN/Vodafone mHealth report
  - Few mHealth pilots have gone to scale (2 of 51)

TB Management

- Information systems needs in TB management: tracking cases, lab results, compliance, diagnosis, treatment
- Can personal mobile devices make work processes more efficient and accurate?
- How can this type of system interoperate with existing national systems?
- Development partner: D-Tree / Dimagi

Cold Chain Equipment Management (CCEM)

- Manage and forecast cold chain equipment needs based upon a national equipment inventory
  - MS Access based inventory management / forecasting tool
  - Initial development at Path
  - Revision by external software company
  - Ongoing product management by Path
CCEM 2.1

Beta Phase
- Code stabilization and validation
- Field evaluation
  - National level forecast (country TBD)
CCEM 2.1 release
- 2 or 3 in-country deployments
- Transfer of CCEM 2.1
- Decision on CCEM 3.0 project

Software Engineering at PATH

- Challenges and experiences from CCEM are not unique
- Lessons from CCEM 2.1
  - Need for specifications
  - Communication with developers
  - In house software testing
  - Management of data sets
- How should Path manage software development projects?

Handheld CCEM

- Implement components of CCEM on mobile device
  - Data collection for equipment inventory
  - Facility level evaluation of required refrigeration capacity
- Partner with UW
  - Implement on Android phone with ODK
  - Focus on smart phone capabilities

SARA

- Systematic, architected rational approaches to ICT systems and solutions
  - Methodology for gathering user and systems requirements
    - Facilitated workshops with users, experts, and stakeholders
    - Templates for Health Usage Scenarios
    - Define business processes and work

Applications of SARA

- Requirements gathering workshop for Sputum Fixers in Tanzania
- Systems requirements for national scale TB management system
- CRDM for logistics systems (Kenya, Senegal, Vietnam, Rwanda)
- Use case validation for Smart Connect in Nicaragua
- Evaluation of need for CCEM 3.0
Requirements gathering for SmartConnect, Nicaragua 2010

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January 11 – January 15

• Monday
  – Minesterio de Salud
  – Health Center, Juigalpa
• Tuesday
  – Nueva Guinea
  – 3 Health Posts
• Wednesday
  – Minister of Health
  – Managua

• Thursday
  – Leon SILAIS
  – Santa Rosa del Pinon
  – Carazo SILAIS
• Friday
  – Jinotega SILAIS
  – Health Center
  – 3 Health Posts
El Serrano: Doctor with Assistant

La Fonseca

La Fonseca

La Fonseca: Solar Panels (not in use)

Health Post Zompopera

Nicaragua Public Health System
- Health Post
- Health Center
- SILAIS
- MINSA (Ministry of Health)

“Under resourced but functional and rational”
Cell Phone Coverage

- Two companies
  - Claro
  - Movistar
- Claro has much broader coverage for rural areas
- Electricity may have wider distribution than cell phone coverage
  - Did not see any candidate solar + cell phone sites

Health Post Connectivity

- Visit included moderately remote health posts.
  - All were close to cell phone connectivity, some on site, some required a walk up the hill, other it depended on the quality of the phone
- Previously, Health Posts had radios, but these are being phased out where cell phones are available
- Communication from HP to HC often easier than communication from HC to HP
- Travel and visits another important communication mechanism

Cold Chain

- 1350 refrigerators, including 250 solar. Kerosene is going extinct
- Vaccine distributed monthly to Pacific, once every three months in Caribbean
- Electric refrigerators considered reliable
- Problems with solar refrigerators
  - Primarily with solar generation

Cold chain reporting

- Consistent recording of temperature twice a day
- SILAIS has refrigerator technician
  - On call for repairs
  - Annual maintenance visits
- Vaccination data reported up from Health Posts
Power situation

- Grid power generally good
  - Has improved in recent years (help from Hugo)
- Power lost one evening during visit
- Some health centers identified power as a problem
- Low voltage (should be 110)
- Some sites recently added to grid recently

Surveillance Reporting

- Reports on diseases and mortality
- Daily or weekly from Health Post to Health Center to SILAIS to MINSA
- Submitted through different mechanisms
  - Phone, Radio, Hand delivery
- Commitment to accuracy at all levels
- MINSA wanted more frequent reporting
  - Complained no data came in on weekends

Use of surveillance data

- Summarize at Health Center and above
- Health Centers and SILAIS generated statistics and used them for evaluating programs and tracking results

Computer Use

- Computers at SILAIS and Health Center
  - Even a few health posts
  - Used for data entry (Excel)
- Internet only at SILAIS level
- Carazo SILAIS has long distance WIFI project to connect with health centers funded by Luxembourg

Incidence Reporting Pilot

- Three month cell phone pilot of incidence reporting
  - Prompted by need for data on cases of Dengue
- 50 phones distributed to facilities in Managua
  - Forms based data submission
  - Frontline SMS
- Considered very successful by all participants
  - Effective data collection
  - Model of facility controlled, special purpose phone worked well
  - Used for incidence reporting and patient tracking

Information flows

- Surveillance data
  - From Health Posts to MOH, collated at various levels
- Immunization
  - Twice daily temperature recording (reported???)
  - Vaccination numbers
  - Adverse reports, incidence reports on vaccination preventable diseases
- Pregnancy tracking
  - HP to HC only?
- Incidence reporting
  - PILOT Program: HC to SILAIS level
Summary

• ICT at PATH
  – Major theme: health system strengthening
  – Computing is not the core mission
    • But still useful
  – Take projects to scale
    • David Lubinski: “No more pilots”, No “computer science projects”
    • Partnership requirements
      – Private sector, donors, governmental
  – Identifying opportunities across organization