Cold Chain Equipment Visualization

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Change seminar

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Context

PROBLEM SPACE
- Cold chain a key factor of vaccine programs
- CCEM database for tracking and modeling is complex, not intuitive to use
- Many health ministries and NGOs need to be able to easily model current and possible situations for action and funding

DESIGN QUESTION How can public-health officials use a map-based visualization interface to improve their ability to model vaccine cold-chain equipment scenarios?

SOLUTION A map-based, interactive visualization for modeling equipment scenarios

Background Research

LITERATURE REVIEW
- Cold chain
- Games
- Visualization
- Health care logistics
- Algorithms

RELATED PROJECTS
- PATH Cold Chain Equipment Manager
- Vaccine Modeling Initiative
- UNICEF Cold Chain Logistics taskforce

INTERVIEWS Richard Anderson/UW, Sophie Newland/PATH, Mark Chen/UW

TURN-BASED GAME ANALYSIS

Iterative Design

FEEDBACK ON DESIGN CONCEPTS FROM PARTNERS
- Regular meeting with PATH
- Ongoing guidance from Richard

USABILITY TESTING – TWO ROUNDS

MID APRIL
- Basic paper prototype
- Goal: testing ease of use, navigability
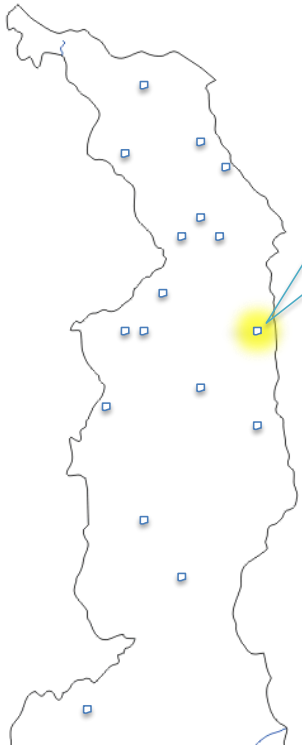- Tested with four people

LATE MAY
- Hi-fi, interactive prototype
- Goal: testing word choices, symbols, interaction patterns
- Tested with four people

MAIN | MAP | Inventory Mngr. | Optimization | Reports | Settings

VIEW | **EDIT**

Editable! fields!

REGION 5

Facility X

GPS: Lat: 13° 58' 60.00"S
Lon: 33° 46' 60.00"E
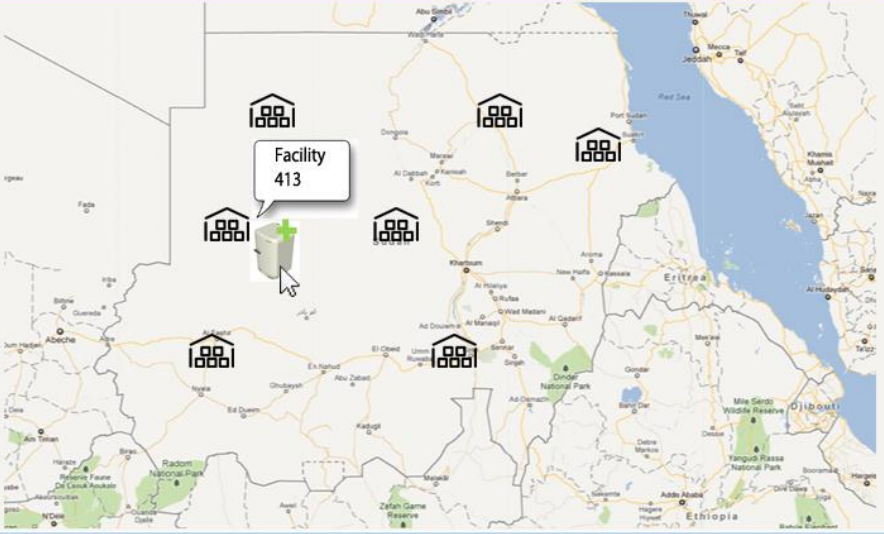
Dropdown selection!

TYPE: Health centre – private

PRIMARY ENERGY SOURCE:
Kerosene

ENERGY AVAILABILITY:
Sometimes available

REFRIGERATORS/FREEZERS:
· Model X
· Model Y
· Model Z

GROUPS:
· Region 5
· Zone 2
· Sub-district 10

FACILITY X
· Nkhata Bay
· Health centre - Private

EDIT FACILITY

Add new field!

Cold Chain Equipment Visualization

Assign and Equipment to

Options

Visual Layers
- ○ Clinics
- ○ Live Births
- ○ Fuel Used
- ◉ Capacity
- ○ Broken Equipment
- ○ Unused Equipment

More

Summary
Spent	$ 0
Moved	0 Fridges
Capacity	0% increase

Full Summary

Assign | Transfer

Electric | Solar | Kerosene | Gas

Automatic Assignment
Options

Mkanda Clinic
Capacity	45%
Live Births	2,790
Fuels Used	Solar
Equipment	1 Solar Upright
Broken	2 Solar Upright
Unused	none

Mbobo Clinic
Capacity	57%
Live Births	1,300
Fuels Used	Kerosene
Equipment	1 Kerosene Upright
Broken	none
Unused	1 Electric Upright

Benula Clinic
Capacity	58%
Live Births	2,620
Fuels Used	Solar
Equipment	2 Solar Upright
Broken	1 Solar Chest
Unused	2 Kerosene Upright

Lisandwa Clinic
Capacity	75%
Live Births	3,790
Fuels Used	Solar
Equipment	2 Solar Upright
Broken	1 Solar Upright
Unused	3 Kerosene Upright

Kamando Clinic
Capacity	88%
Live Births	2,340 Births
Fuels Used	Electricity

Architecture

SQL database

Ruby on Rails framework

Google Maps

Internal data models

Accomplishments

Demo

Future work

Support for additional scenarios:
- transferring existing resources
- automatic allocation (using algorithms and heuristics)

Visual design explorations and testing – layers, icons, navigation

Field testing

Questions?