

COLD CHAIN EQUIPMENT VISUALIZER

A map-based, interactive visualization of public-health data

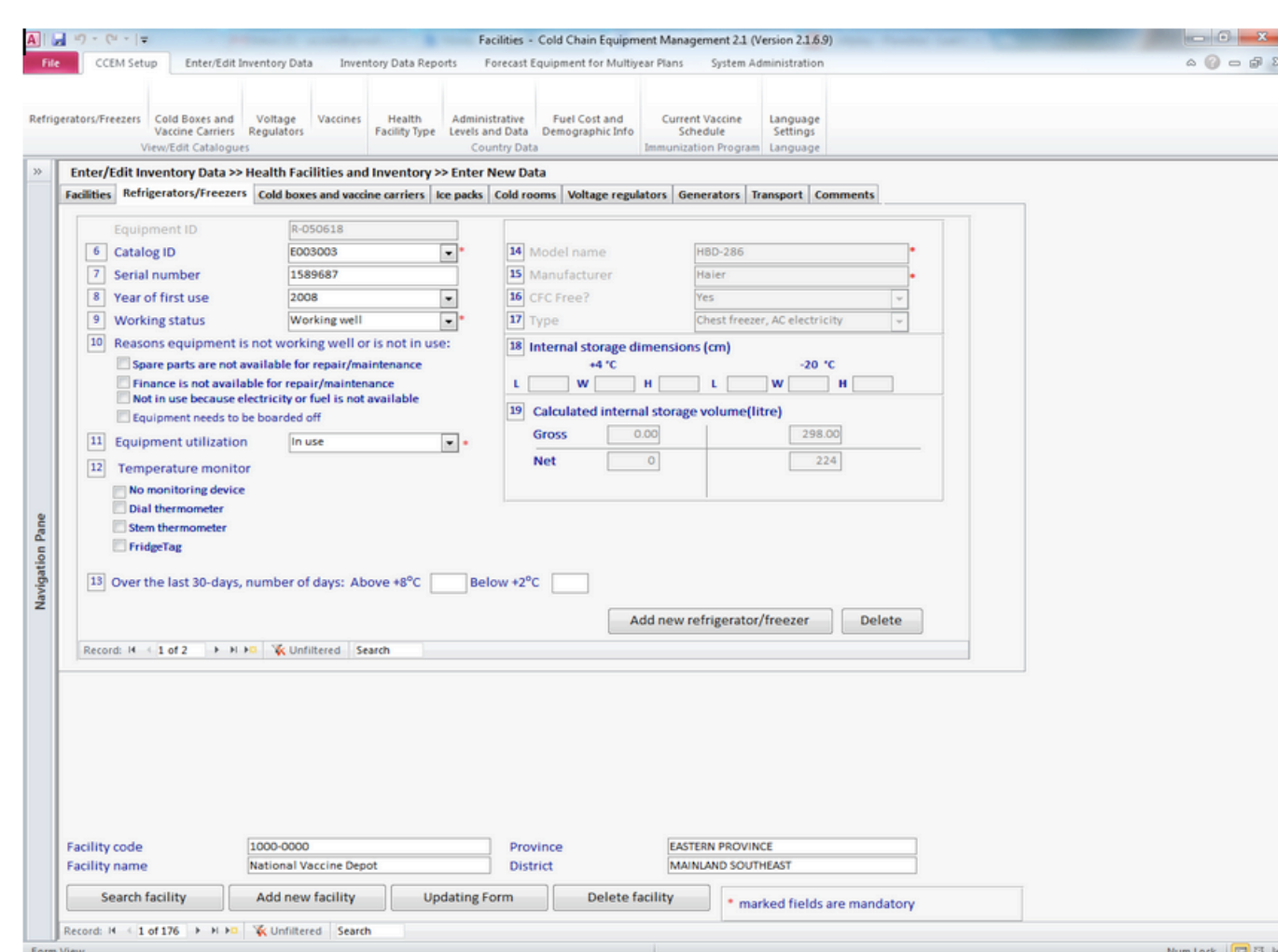
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PROBLEM

- Most vaccines need to be kept at a constant temperature of 2-8 °C until used
- An unbroken cold-chain of cold-rooms, refrigerators, and cold-boxes is needed to transport and store vaccines
- Current information about cold-chain infrastructure is stored in unwieldy databases
- Government health ministries and NGOs need to be able to easily model current and possible future configurations of their cold-chain resources for action and funding

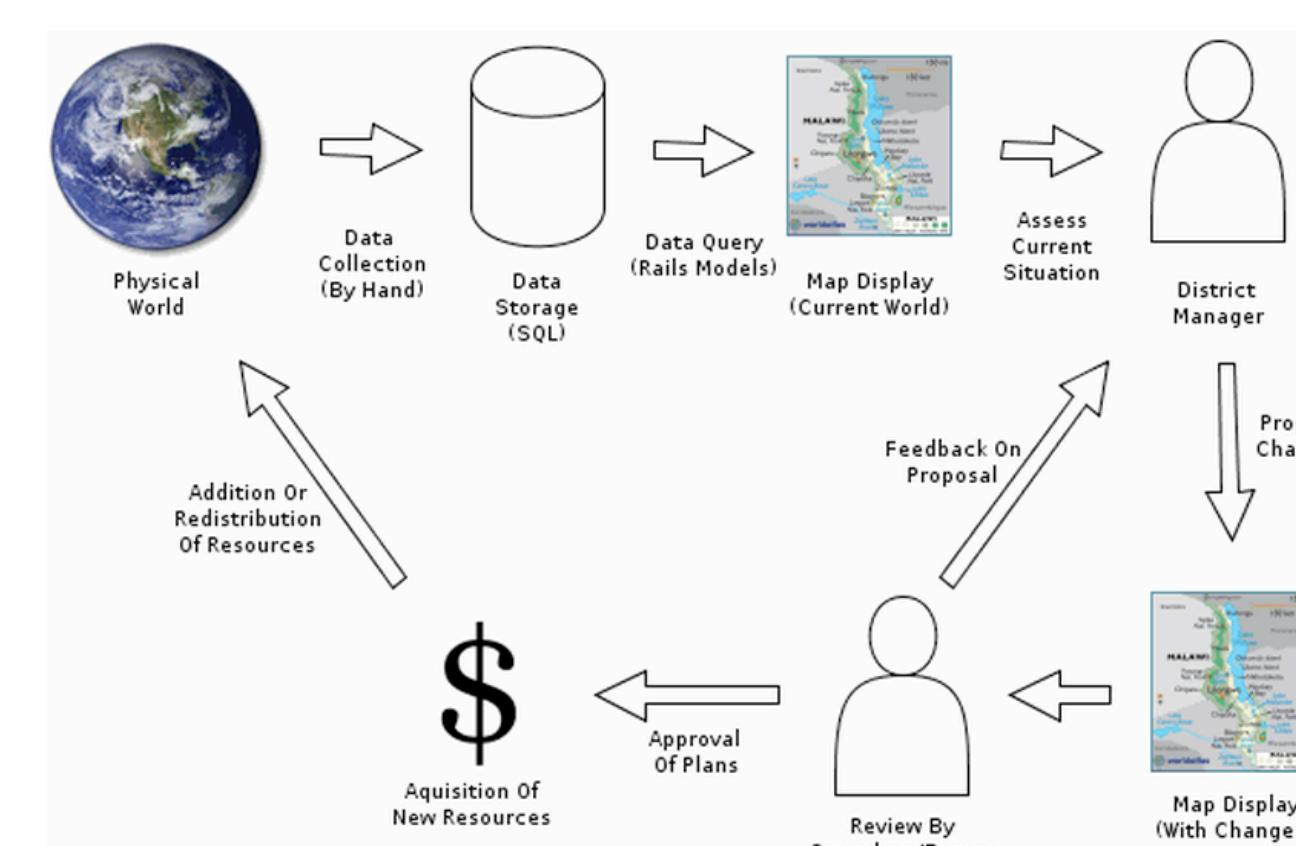
How can public-health officials use a map-based visualization to easily model a current and potential future vaccine cold-chain equipment configurations?

CCEM



- The Cold Chain Equipment Manager (CCEM) is a Microsoft Access database tool developed by PATH
- CCEM allows users to access data related to a country's cold-chain infrastructure including capital resources, vaccine schedules, and clinic data
- CCEM is complex and not intuitive to use
- More information about CCEM is available at <http://www.path.org/publications/detail.php?i=1569>

ARCHITECTURE



Architecture details

- The database is a digital representation of the current physical world
- Managers are able to locally make changes that can be presented as a plan to funding agencies or a superior
- Multiple local copies can be shared or compared, allowing multiple users to assess and address the situation

FEATURES

Database

- Maintained by a centrally responsible agency
- Read-only. Should only be changed when a new region inventory has been completed

Layers & Clinics

- Information shown is context sensitive
- Clinic appearance changes based upon capacity
- Heat maps allow users to quickly assess which areas would be best served with new or reallocated resources

Map

- Separation of facilities into groups based upon district or sub-district
- As little data is displayed at one time as possible to keep the interface clean

Resource Allocation

- Manual allocation should allow a user to have full control of system resources
- Automatic or assistive allocation would allow a user access to algorithms and metrics to best distribute resources to underserved areas

RELATED WORK

Cold-Chain

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



Mapping & Visualization

- Ushahidi – A disaster response tool used to map requests for help
- Livehoods – A neighborhood mapping tool using Foursquare check-ins
- Hipmunk – A popular travel planning website

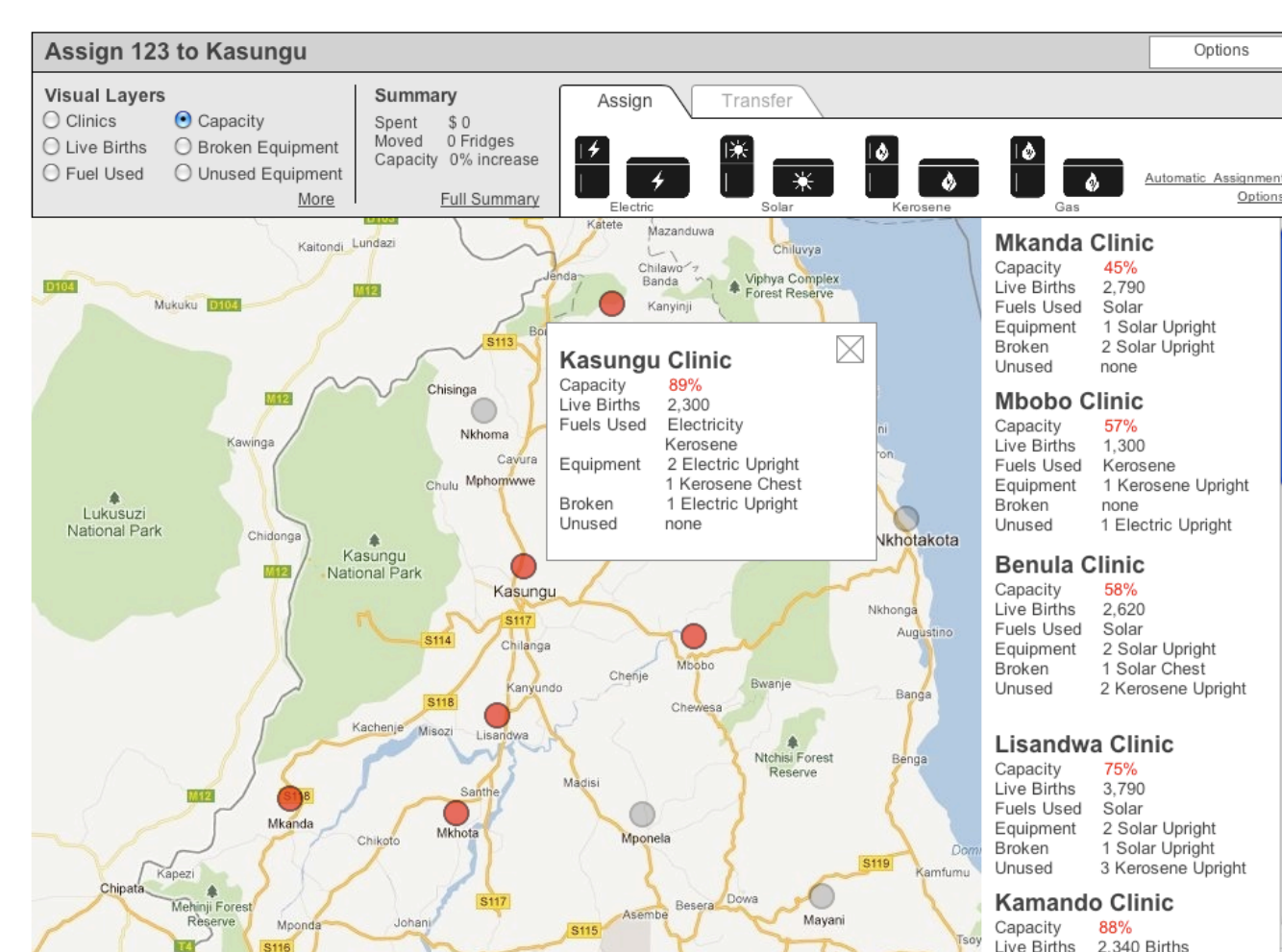
PROTOTYPING

Evolution

- Early paper mockups
- Early hi-fi mockup (Visual Studio) as a desktop application
- Recent hi-fi mockup (Axure- see figure to right) as a web application

Iterative design based on stakeholder input

- Regular status checks with PATH partners and instructors
- Usability testing
 - Round one: basic paper prototype
 - Round two: interactive Axure prototype



WEB APPLICATION

