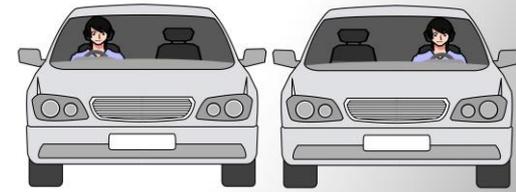# DATA STANDARDS FOR COLD CHAIN INFORMATION SYSTEMS: A FRAMEWORK FOR INTEROPERABILITY

Richard Anderson

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Data Standards

- W3C Standards for the WWW
- USB Standard
- GS1 Barcodes
- ITU GSM Standard

TechNet-2015

Interoperability

- Working together
- Standards enable interoperability in different ways
  - Sharing data across systems
  - Utilizing data from different sources
  - Interfaces for direct connection between systems
- Precision of data standards
  - Domain (Framework)
  - Detailed (Technical Standard)

Open data standards

- Transparent and impartial
- Collaboration to advance a domain or industry
- Construction, governance, and maintenance of a standard
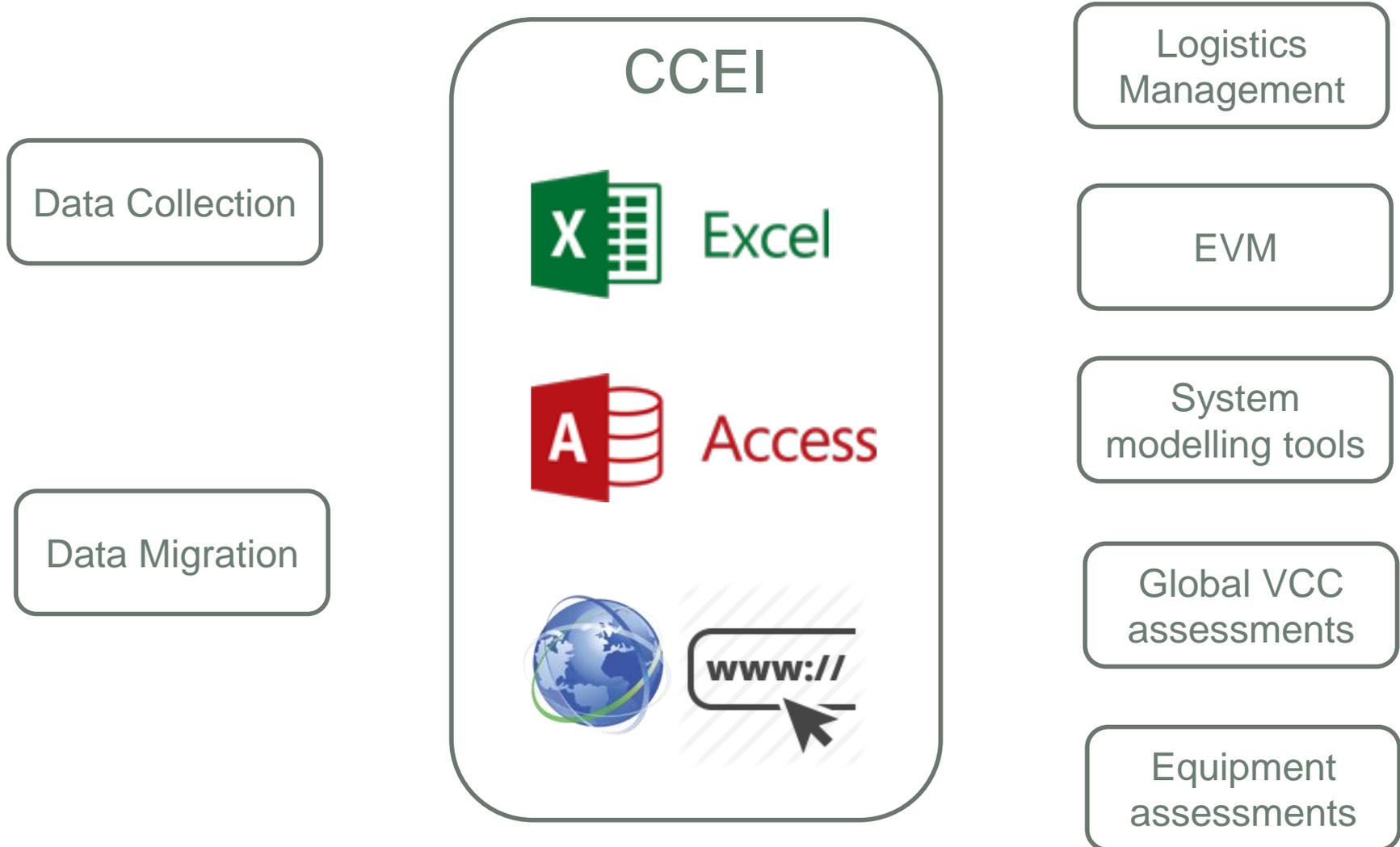
Cold chain information systems

Cold chain equipment inventory

- Inventory of nations cold chain equipment with facility information
- Effort by UNICEF CCL group to give formal definition of CCEI
- Influenced by CCEM
- Multiple phases of revision

Temperature Monitoring

- Temperature reporting from vaccine refrigerators
- Capture multiple modes
  - Manual reporting
  - 30DTR
  - Remote reporting devices
- Initial convening and workshop group
- Work in progress
  - Needs broader input from device manufacturers

Vision: Cold chain equipment inventory

Data Collection

Data Migration

CCEI

Excel

Access

www://

Logistics Management

EVM

System modelling tools

Global VCC assessments

Equipment assessments

Vision: Temperature monitoring

What I would like to see happen

- Cold chain equipment inventory
  - Wrap up the last details
  - Determine appropriate body / mechanism to manage the standard
  - Develop interchange format for CCEI
  - Software tools developed to utilize CCEI more effectively at country and global level
- Temperature monitoring
  - Establish working group to refine efforts on data standards
    - Data use: Align multiple reporting approaches
    - Integrated devices and data repositories: Enable flexible deployments by countries
  - Determine appropriate body / mechanism to manage the standard

Break out groups

- Divide into groups with facilitators / scribes
- Focus on one of the two standards
- Question one:
  - Feedback on the current proposals.
- Question two:
  - What is the appropriate organization / structure for managing the standard
- Question three:
  - What are the immediate next steps to move forward

- Scribes will record a summary of the session
- Additional feedback to anderson@cs.washingon.edu

Extra slides

Data Standard: Cold Chain Equipment Inventory (CCEI)

CORE Modules

Extended Modules

Health Facilities

Refrigerator

Fridge Repair

Temperature Monitoring

Transportation
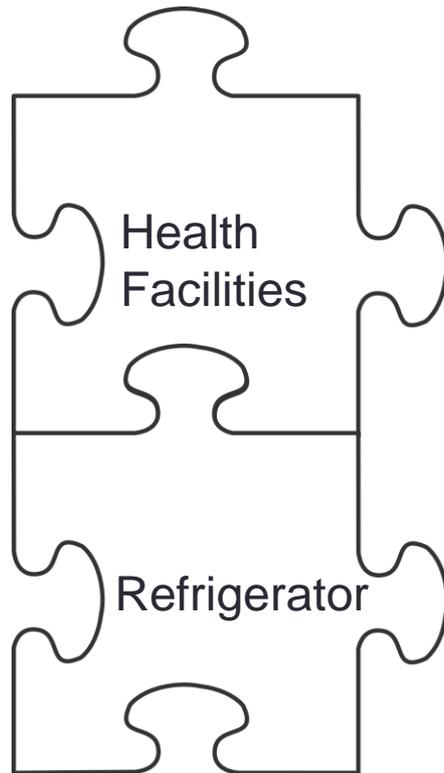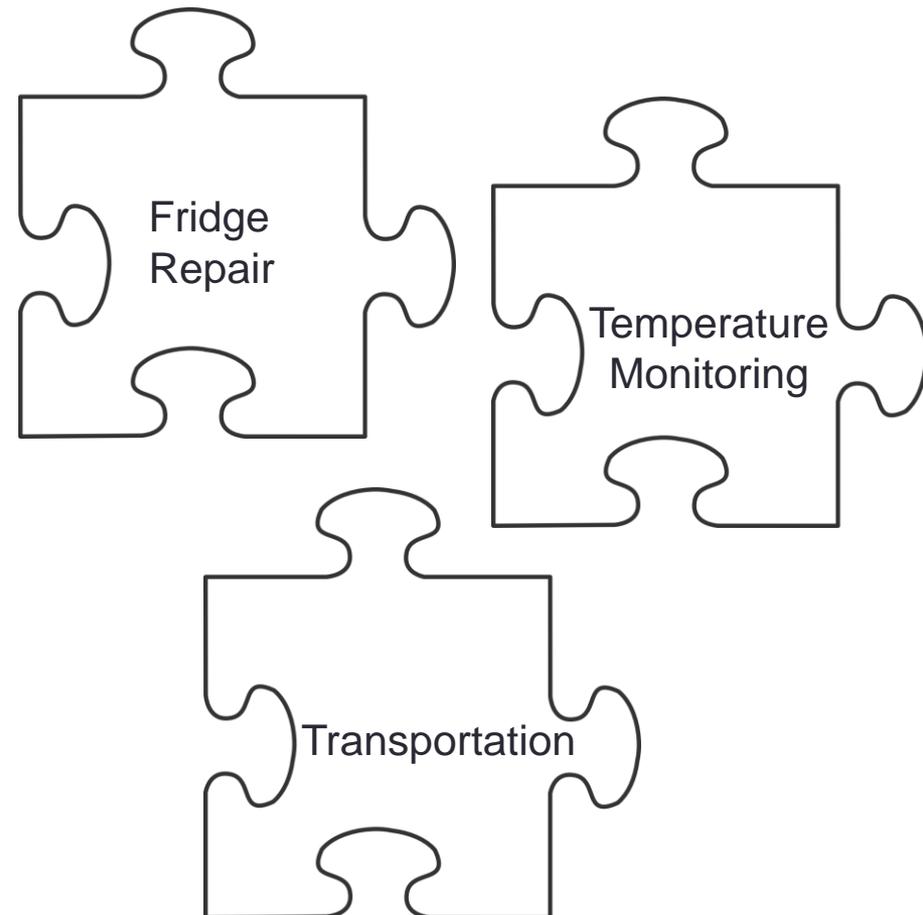
CCEI Data Model

Data Model			
Name	**Type**	**Comments**	**Req.**
Recommended Name	String, Numeric, Enumeration, Composite, Table ID	Explains purpose of the field with details about type like keywords for enumeration or unique constraint	Y/N

CCEI Data Model

Facility

	Name	Type	Comments	Req.
1.	Facility ID	String	Primary key for the application. This ID must be unique.	Y
2.	National Facility ID[i]	String	Official ID of the facility, from a master facility list.	N
3.	Facility Name	String (UTF-8)	The name of the facility. Standard capitalization should be used. The UTF-8 representation allows multiple scripts to be used.	Y
4.	ASCII Name[ii]	String (ASCII)	The name of the facility in ASCII (e.g., basic Latin characters, without accents).	N
5.	Administrative Region[iii]	Admin NodeID	Location in the administrative (geographic) hierarchy. The information is extracted from the Admin Table	Y
6.	GIS Coordinates[iv]	String	Use the ISO 6709 standard for representing latitude and longitude (and possibly altitude). Decimal degrees is the preferred format.	N
7.	Facility Type[v]	Enumeration	Type of facility from a fixed list of possibilities: StorageX, HospitalX, HealthCenterX, HealthPostX, OtherX. X is an integer that allows different levels of the same type. [List TBD]	Y
8.	Facility Ownership	Enumeration	Ownership of facility from a fixed list of possibilities: Public, Private, NGO, FaithBased, Other. [List TBD]	Y
9.	Facility Population[vi]	Numeric	Total catchment population for the facility.	Y
10.	Facility Coverage[vii]	Numeric (Percent)	Percentage of Population receiving routine immunization services from the facility	Y
11.	Storage Type	Enumeration	Storage for transfer to another facility, or storage for use at the facility. {Depot, Delivery, DepotAndDelivery,	Y

Refrigerator

	Name	Type	Comments	Req.
1.	Unique ID	String	Unique ID for the application. (This ID should be unique across all asset types)	Y
2.	Model ID	String	Key into an official catalog. Information about the model is derived from this.	Y
3.	Equipment tracking ID	String	Ideally, the real serial number. However, this is not always available or maintained at the facility.	N
4.	Bar Code	String	If a barcode is used, the information can be stored here	N
5.	Year	Numeric	Year of acquisition (manufacture). Often not accurate (but may not need to be.)	N
6.	Source	String	Where the equipment came from	N
7.	Working status	Enumeration	Functioning, AwaitingRepair, Unservicable	Y
8.	Reason not working or not in use	Enumeration	NeedsSpareParts, NoFinance, NoFuel, Surplus, Dead, NotApplicable	N
9.	Utilization	Enumeration	InUse, NotInUse, InStoreForAllocation	Y
10.	Voltage regulator	Enumeration	For electric equipment, is it connected to a voltage regulator. Yes, No, Unknown, or NotApplicable. NA for non-electric	N
11.	Power source	Enumeration	Electricity, Gas, Kerosene, Solar, Unknown	N

Cold Chain Logistic

Power Infrastructure

Refrigerator Catalog

Admin Hierarchy

Process of CCEI Creation