

# Terminology and Modeling



# **Logica Modeling Philosophy**

Stan Huff, M.D., FACMI, FHL7



# The Challenge – too many ways to say the same thing!

## Glucose [Mass/volume] in Blood by Test strip manual

### PreCoordinatedGlucoseModel

name (focus): LN 2341-6 (Glucose [Mass/volume] in Blood by Test strip manual)  
data.value.units: SCT 258797006 (mg/dL)

### PostCoordinatedGlucoseModel

name (focus): LN 2339-0 (Glucose [Mass/volume] in Blood)  
method (qual): CIMISCT 1111 Test strip manual  
data.value.units: SCT 258797006 (mg/dL)



# Modeling history at Intermountain

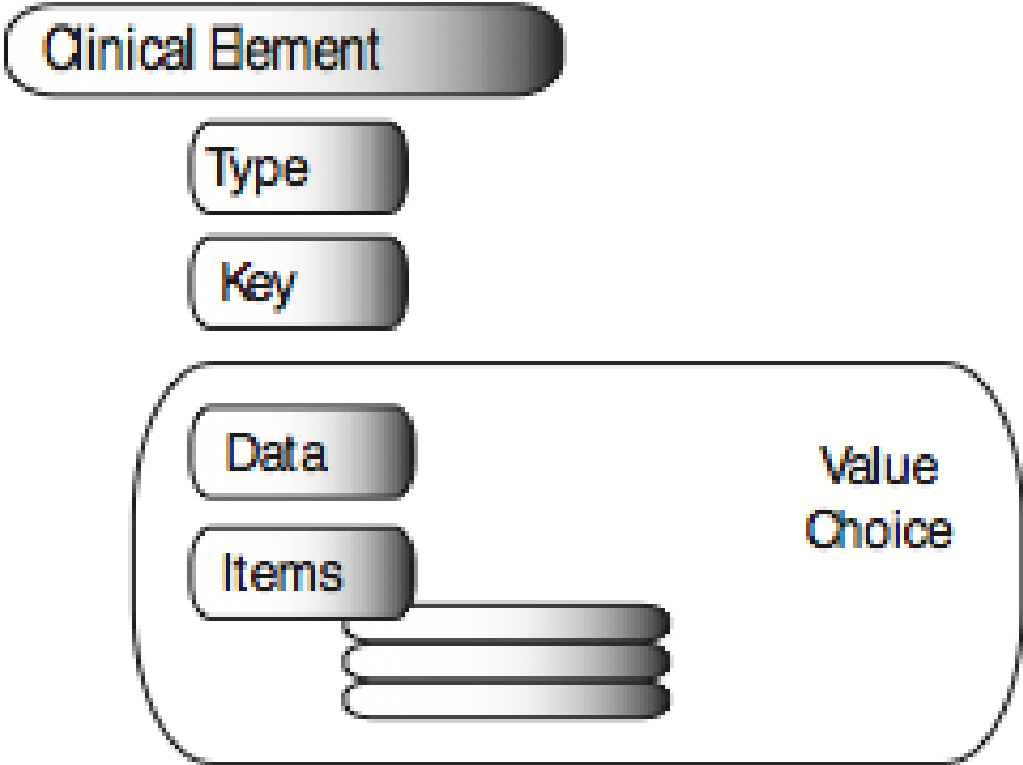
1960's – HELP System, Pointer to Text (PTXT)

1990's – HELP2 – Abstract Syntax Notation 1 (ASN1)

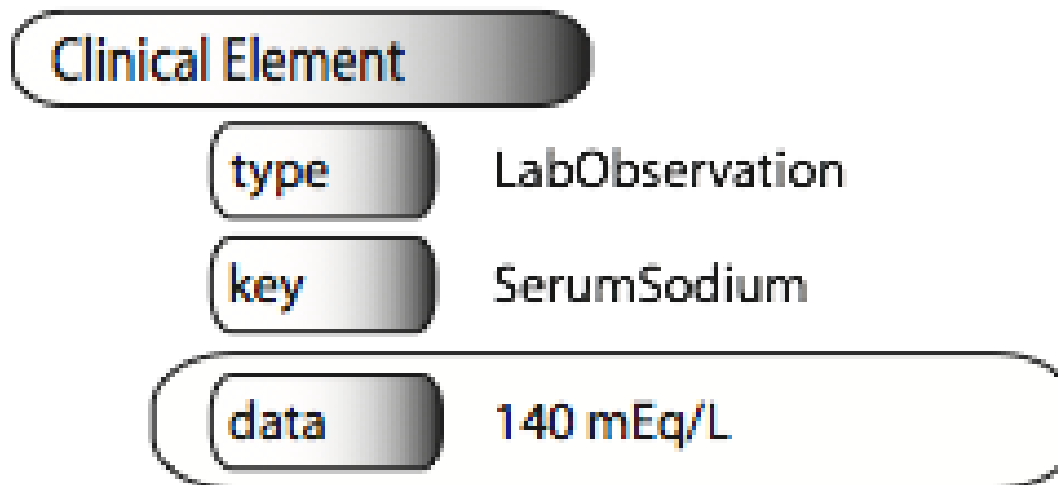
2000's – ECIS – Clinical Element Modeling Language (CEML)



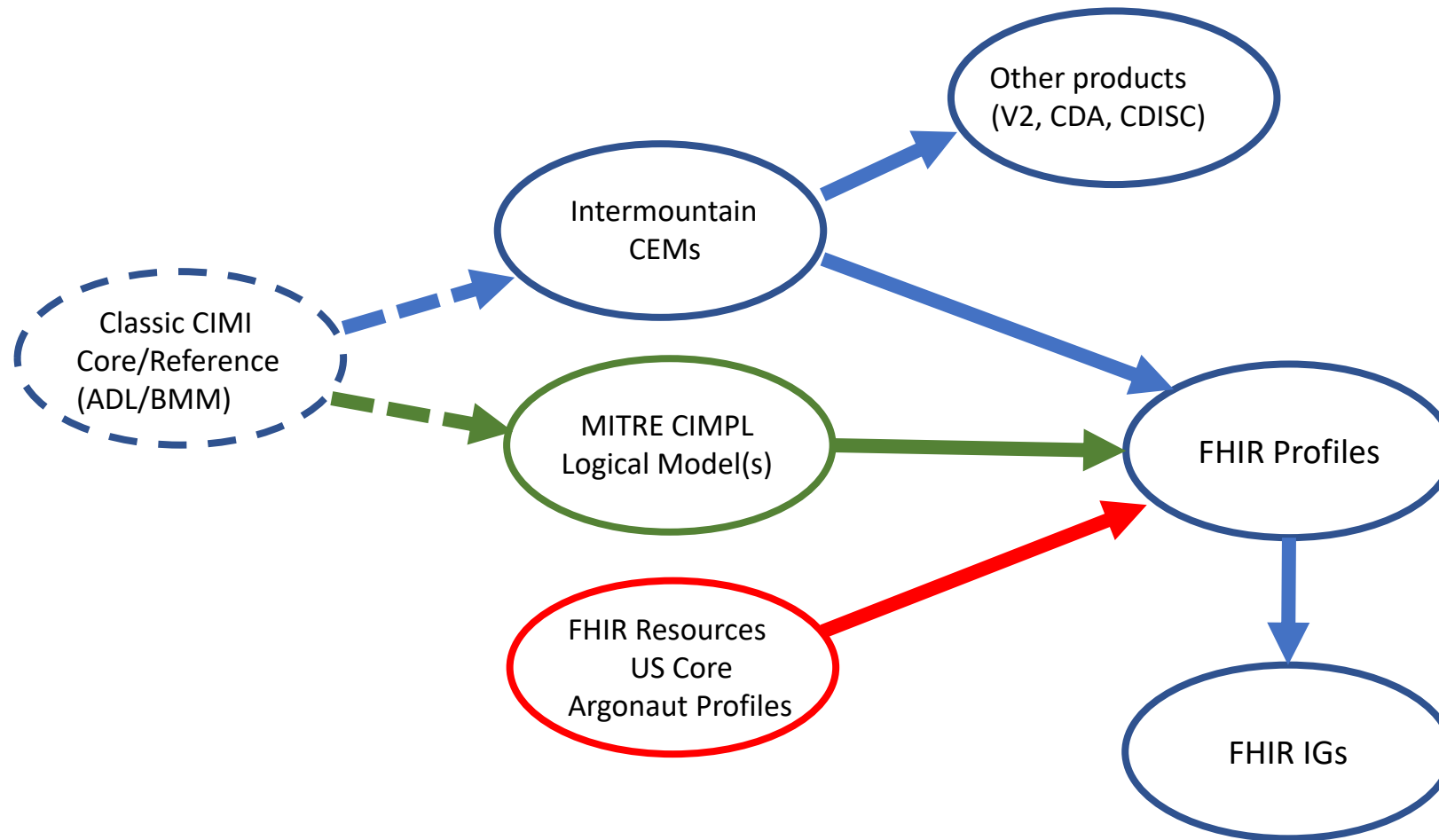
# Clinical Element Reference Model (Joey Coyle)



# CEM Instance Example



# Strategy for Creating FHIR Profiles



# Why CEML?

- It is a mature language
- We have a collection of 7,000+ CEML models already created
- You can make any model you want from recursive use of the base model
- Use of standard terminology bindings is inherent in the model
- We have the CEDAR (Clinical Element Design and Review) editor and other tools for creating and maintaining the models
- CEML is “like” XML so it is easy to make parsers and compilers and other tools
- We control the modeling language if we need enhancements  
(e.g. a new primitive data type for “genetic sequence”)
- We can convert the CEML models to any other modeling formalism as needed
- CEM structure is easy to implement in relational or object oriented databases

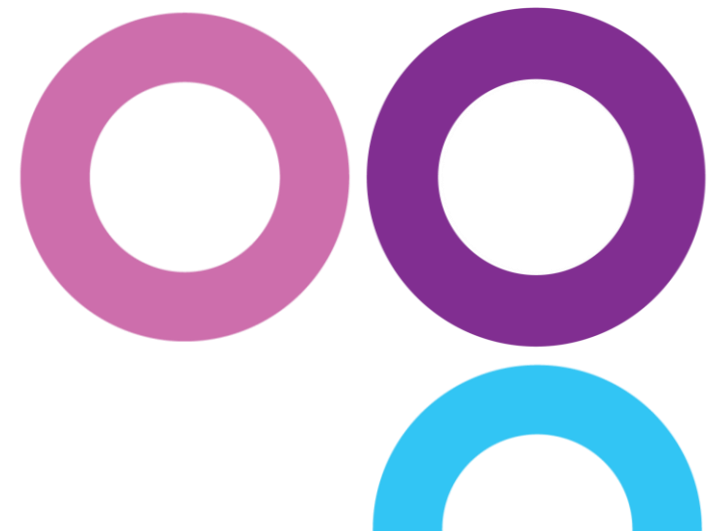






# Introduction to Symedical (CA)

John Wilkinson





Logica Meeting  
August 19, 2020

Overview: 



**Founded:** 2007 in Carmel, Indiana



**Ownership:** Privately Held, No Outside Investment



**Who:** Ninety Team Members



**Where:** Two main offices – Indiana (United States) – Exeter (United Kingdom)



**Mission:** Delivering Innovative Solutions that Maximize the Effectiveness of Healthcare



**Purpose:** Comprehensive Terminology Platform for All Terminology



**Content:** Reliable, Consistent Reference Data Source



**Mapping:** Configurable Terminology Mapping Automation



**Modeling:** Robust and Efficient Modeling Tools, Distributed Authoring



**Utilization:** Extensive APIs, External Publishing, Automated Distribution



## Address

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Office: 317.580.8400  
Sales: 317.268.8957

## Online

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ClinicalArchitecture.com  
LinkedIn: /company/clinical-architecture/  
Twitter: @clinicalarch

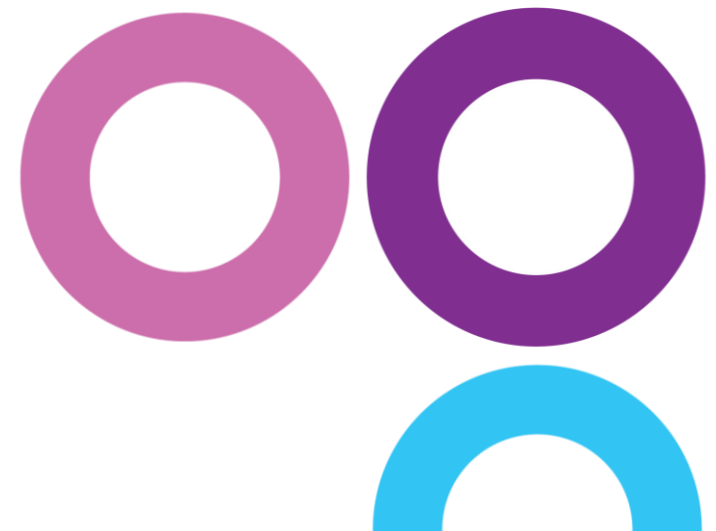
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# **Model Development – Future and Current States**

Susan Matney, PhD, RNC-OB, FAAN, FACMI, FHIMSS, FAMIA



# Agenda

Vision and Current State Of:

- Clinical Element and FHIR Development
- Terminology Management
- Tooling



# The Content Team

## Intermountain/Logica

- Susan Matney
- Nathan Davis
- Joey Coyle
- Laura Heermann Langford
- Stan Huff
- Patrick Langford
- Preston Lee
- Tom Oniki
- Todd Stevensen
- Ning Zhuo

## Logica Volunteer

- Susan Castillo

## VA

- Keith Campbell
- Penni Hernandez
- Sarita Keni
- John Kilbourne
- Holly Miller

## Symedical

- Charlie Harp
- Lois Harry
- Rob King
- Victor Lee
- Carol Macumber
- Shaun Shakib
- Chris Wheeler
- John Wilkinson
- Susan Williams
- Randy Woodward





# CEM and FHIR Development

Current State	Future State
Content request process spreadsheet developed and being used by requesters.	Process fully defined with tooling developed to facilitate the process.
CEM Assertion base type can be transformed to FHIR Condition profiles.	Clinical Element Design and Review Tool (CEDAR) can transform CEMs into FHIR profiles using aligned FHIR resource types.
CEML terminology content imported into Symedical and being QA'd.	CEML terminology content is QA'd, published to run time in Symedical for all CEM base types and Logica projects.
Technical and Clinical approval process being developed by Logica Product Management Group	CEML and FHIR models clinically and technically approved and published for all current Logica projects.



# Terminology Management

Current State	Future State
Services have been tested by CEDAR	Terminology server and services running and being accessed by CEDAR and Logica Sandbox
Content is loaded, now validating terminology mappings	All content required to support FHIR and CEMs loaded and validated in Symedical
Content request spreadsheet developed	Terminology authoring process developed and in place
LOINC submission are manual as needed.	Process in place for submissions and tracking
Selected content from the Logica SNOMED extension has been submitted to SNOMED for inclusion including recommended classification rearrangement to fix SNOMED errors of omission.	Process in place for SNOMED CT submissions and tracking
Working in both Solor and Symedical	Collaborative editing in place
RF2 releases from Solor Extension namespace being requested for Symedical	Solor RF2 releases that contains all extension content from both Symedical and Solor



# Terminology and Model Tooling

Current State	Future State
Current model web browser frameworks are inflexible	Web browser updated (responsive for mobile and desktop) and tied to live terminology.
Browse and search by element name	Tree browse by hierarchy and ability to search by base type and model type (e.g. Clinical Assert/ Diabetes Mellitus Type 1)
Views: Tree view, ctml, xml, json	Multiple Views added: Mind map, by status
Export to raw formats. Can also export to excel using CEDAR desktop only.	Ability to export models with associated value sets and terminology bindings.
APIs tested and functioning. Need to release to users	CEDAR desktop – linked to Symedical for users
Output generator <ul style="list-style-type: none"><li>• FHIR transform from assertion to condition</li><li>• XML without terminology bindings</li><li>• Excel export developed but not enabled for users</li></ul>	Output generators: <ul style="list-style-type: none"><li>• FHIR transforms</li><li>• XML with terminology bindings</li><li>• Export to Excel</li></ul>





# **Collaborative Editing Proposal**

Keith Campbell, MD, PhD, FACMI



# Guidelines for a Standardized Terminology Knowledge Base

- HL7 vocabulary working group project
- Standardize the representation of terminology knowledge bases
- Support exchange of inflight content across environments
  - a. Standardized change set format
  - b. Git hub repository
- Organizations wishing to design and implement collaborative editing across platforms are encouraged to participate



