

HIMSS

**TRANSFORMING
HEALTH THROUGH IT**

Semantic Interoperability
(a.k.a. the long road)

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DISCLAIMER: The views and opinions expressed in this presentation are those of the author and do not necessarily represent official policy or position of HIMSS.

Disclaimer

I have both a salary and equity interested in Diameter Health, a health IT vendor involved with this topic

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Learning Objectives

- Explain the challenges to semantic interoperability
- Describe approaches to data exchange that support semantic interoperability
- Introduce research and best practices in data quality (i.e. data hygiene)
- Review how data transformation can be necessary for essential goals in population health & value-based care

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Building Interoperability

Cyrus West Field



1857

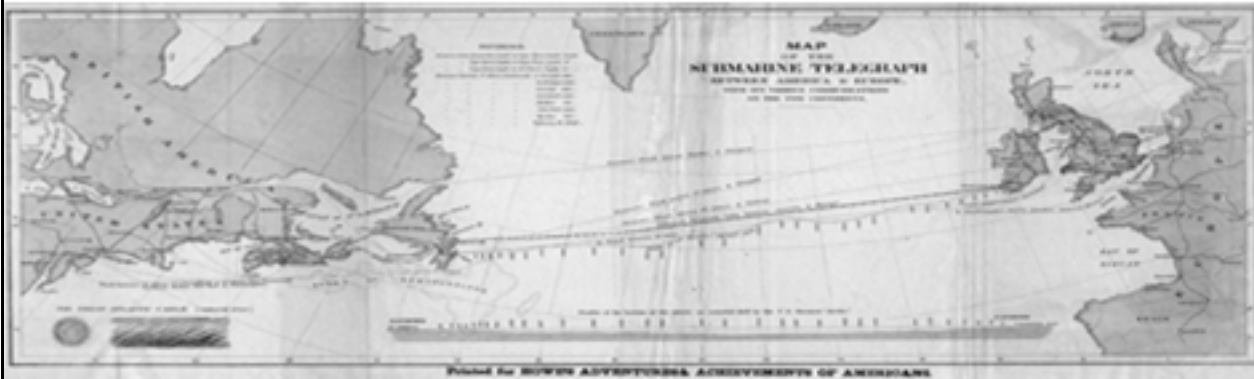
Fail, Fail,
Fail, Fail

1858

Success for 3 weeks

1866

First Permanent
Telegraph



Semantic Interoperability, Circa 1866

President Andrew Johnson, US



Do you speak English?

Louis-Napoléon Bonaparte, France



Je ne peux pas parler Anglais!

Technical but not semantic exchange

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Defining Semantic Interoperability

Semantic interoperability, one definition:

“the ability to import utterances from another computer without prior negotiation, and have your decision support, data queries and business rules continue to work reliably against these utterances.”¹

Why it's harder in healthcare:

- Financial transactions have a single, unifying concept (dollars)
- You don't need to know every word to have a conversation (the average person knows about 45,000 words)
- In healthcare, there are more than 1,000,000 terms spread across multiple vocabularies (RxNorm, ICD-10, SNOMED, LOINC, CPT) with significant overlap between concepts

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1. Dolin RH, Alschuler LA Approaching semantic interoperability in Health Level Seven. JAMIA 2011

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Volume of Document Exchange

Since the beginning of this presentation:

**>2,000 documents exchanged
(> 20 million / month)¹**

All of them are available for viewing, but....

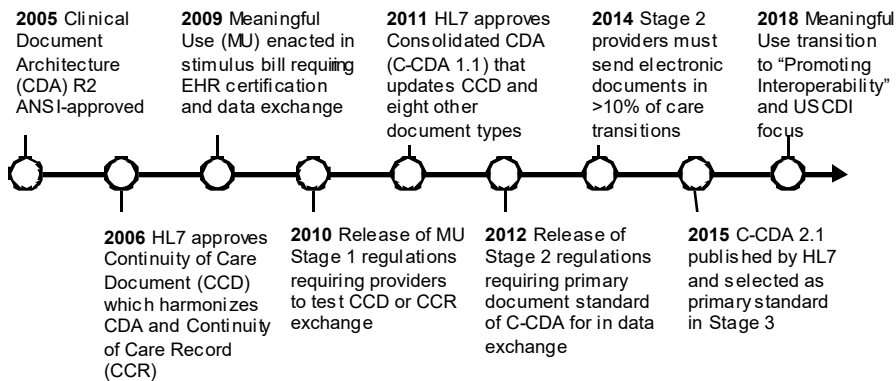
Very few can be automatically imported for use
by decision support, business rule and data queries



1. See Modern Healthcare Providers are sharing more data than ever. So why is everyone so unhappy? April 2015

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How Did We Get Here?



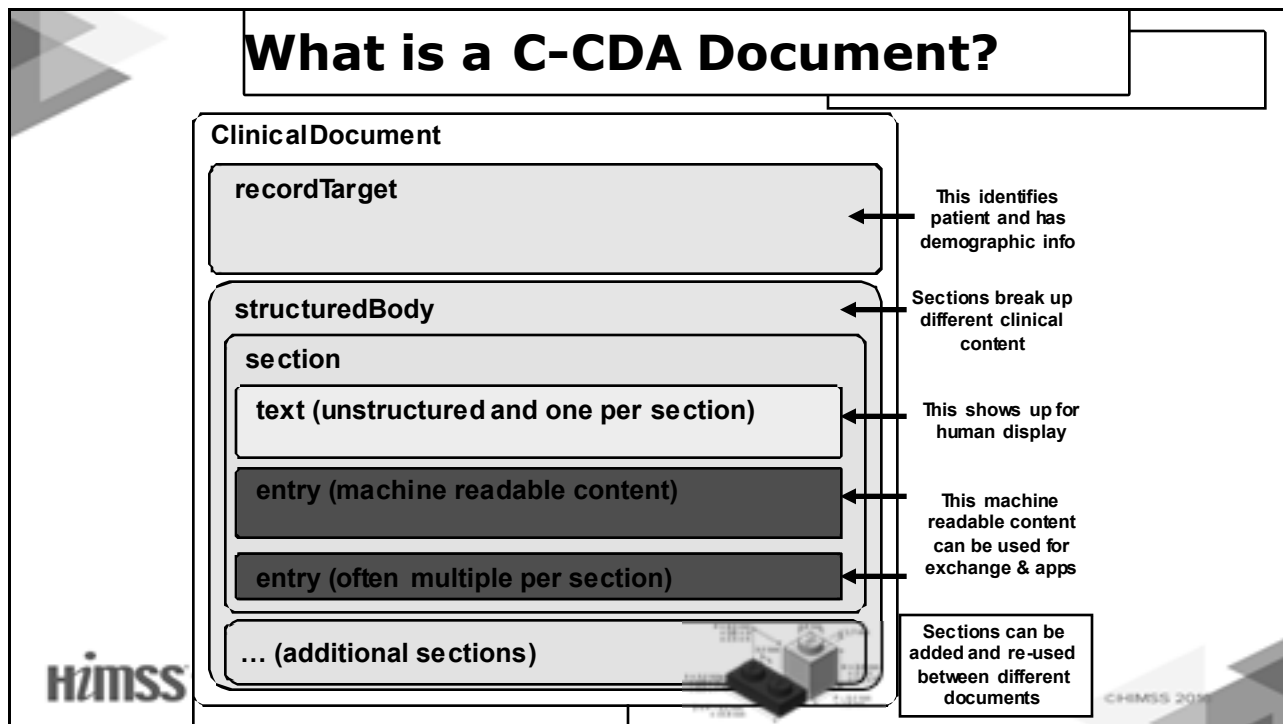
ANSI American National Standards Institute
 CCD Continuity of Care Document
 C-CDA Consolidated Clinical Document Architecture
 CCR Continuity of Care Record

CDA Clinical Document Architecture
 EHR Electronic Health Record
 MU Meaningful Use
 HL7 Health Level 7
 USCDI US Core Data for Interoperability



Adapted from SourceMedTech Boston 2014
<https://medtedhboston.medstro.com/blog/2014/08/11/c-cdas-the-fuel-for-medical-apps/>

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Types of C-CDA Documents

| Document | 1.1 | 2.1 | Notes |
|--|-----|-----|--|
| Continuity of Care Document (CCD) | ✓ | ✓ | Used since Stage 1 and primary document for MU exchange |
| Care Plan | | ✓ | Care planning has been significantly uplifted in C-CDA 2.1 |
| Consult Note | ✓ | ✓ | Mostly narrative text |
| Diagnostic Imaging Report | ✓ | ✓ | Mostly narrative text |
| Discharge Summary | ✓ | ✓ | |
| History & Physical | ✓ | ✓ | |
| Operative Note | ✓ | ✓ | |
| Procedure Note | ✓ | ✓ | |
| Progress Note | ✓ | ✓ | Mostly narrative text |
| Referral Note | | ✓ | Mostly narrative text |
| Transfer Summary | | ✓ | |
| Unstructured Document | ✓ | ✓ | Not eligible for MU |

MU: Meaningful Use program for Electronic Health Records
Based on HL7 C-CDA 1.1 & 2.1 Implementation Guides & Meaningful Use regulations

Longitudinal (HIE) eCQM Model

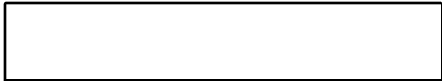
| | Patient John | Problems | Labs | Compliance* |
|---|-----------------|---|---|---------------------|
| <ul style="list-style-type: none"> ▪ Collecting all the data across care settings provides more robust basis for quality measurement ▪ Multi-source data fills gaps without having to labor with EHR integration ▪ Single source of truth assures validity and meets audit requirement for VBP | Dr. Tyrell | <div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto;"></div> | | Compliance |
| | Dr. Stark | | | Compliance |
| | Dr. Gowley | | Hypertension Heart Failure Diabetes | BP of 95/65 mmHg |

BP = Blood Pressure: Systolic / Diastolic
 * Measure Logic for Measure CMS165v5 Controlling High Blood Pressure

Interoperability & Pop Health

- Need to create a usable longitudinal record
- Need to structure data which is critical to high quality care
- Interoperability will improve with financial imperative

- Ambulatory quality care is a team sport
- Reports used to affect reimbursement must have an audit trail
- No EHR has the entire picture, so must share data



Thank You & Questions

Remind me to repeat questions before answering!

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