



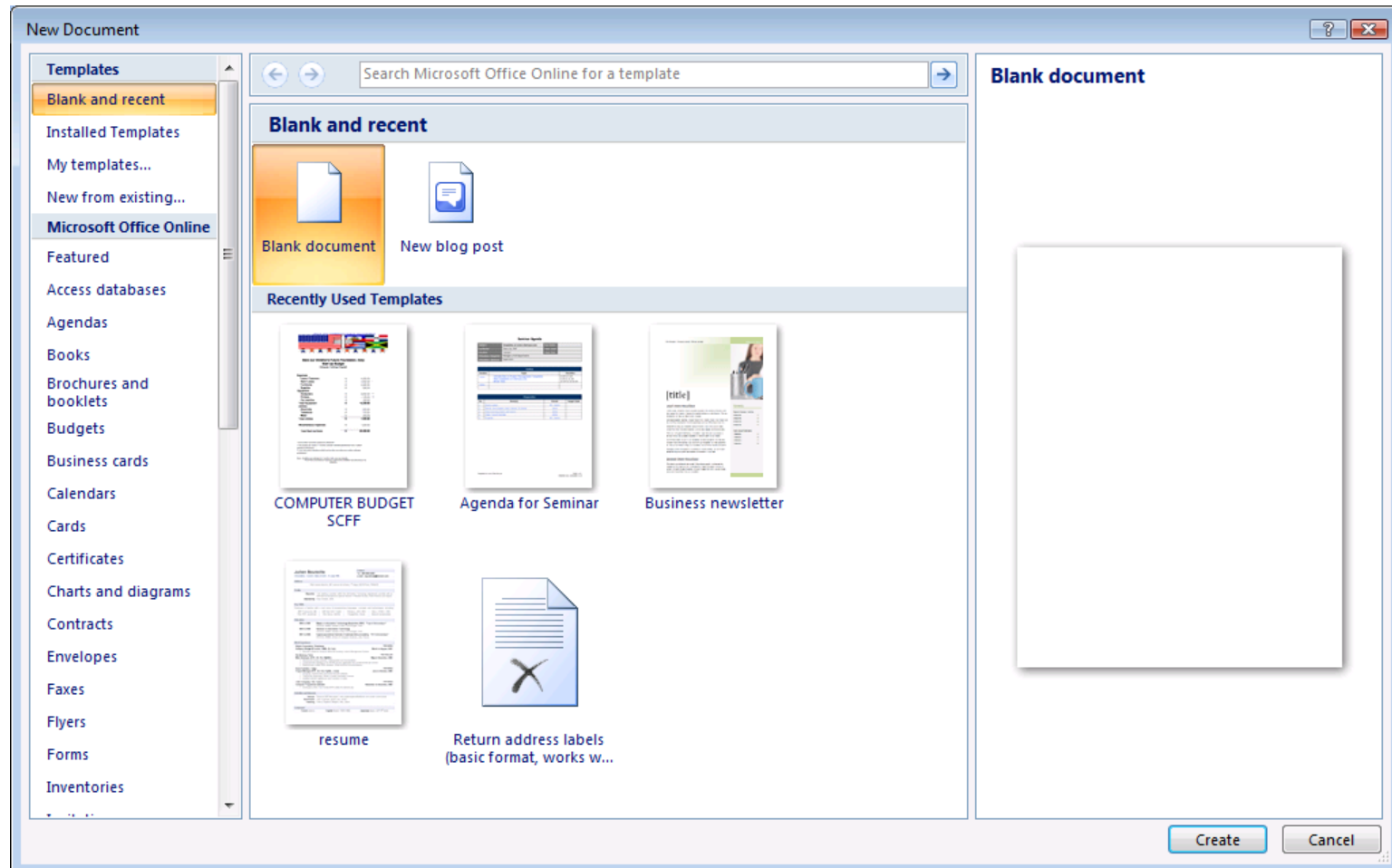
Templated CDA and CDA Consolidation Project

Bob Dolin, MD, FACP, FACMI, FHL7

Past Chair, Health Level Seven

President and CMO, *Lantana*
CONSULTING GROUP

What is templated CDA?



What is templated CDA?

History

Frequency of wheezing:

- ☐ Daily and continual.
- ☐ Daily but not continual.

Episodes per week :: _____

Labs

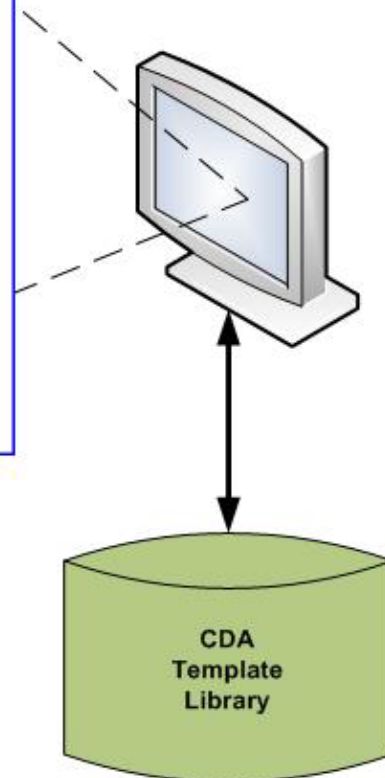
Peak Flow :: _____ l/m.

Assessment

- ☐ Asthma, Intermittent.
- ☐ Asthma, Mild Persistent.
- ☐ Asthma, Moderate Persistent.
- ☐ Asthma, Severe Persistent.

Plan

- ☐ Pneumococcal Vaccine
- ☐ Complete PFTs with lung volumes.
- ☐ Provide education on peak flow self-monitoring.
- ☐ Environmental and Occupational screening questionnaire.
- ☐ Teach inhaler/spacer/holding chamber technique.
- ☐ Discuss environmental control measures to avoid exposure to known allergens and irritants.
- ☐ Teach self-monitoring.



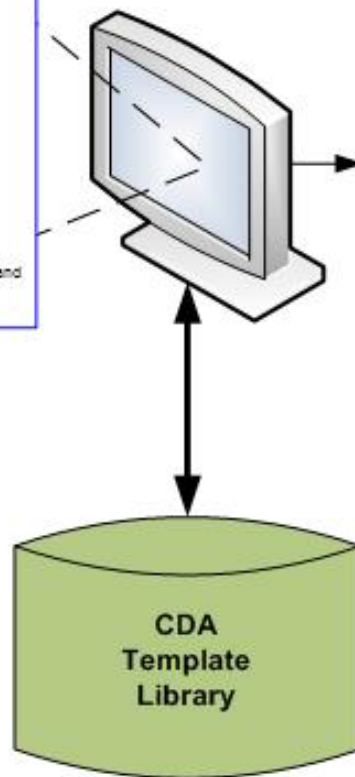
What is templated CDA?

History
Frequency of wheezing:
 ☐ Daily and continual.
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Episodes per week: _____

Labs
Peak Flow: _____ Lm.

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☐ Environmental and Occupational screening questionnaire.
☐ Teach inhaler/spacer/holding chamber technique.
☐ Discuss environmental control measures to avoid exposure to known allergens and irritants.
☐ Teach self-monitoring.



```
<section>
  <templateId root="2.16.840.1.113883.3.27.354"/>
  <title>Plan</title>
  <text>Complete PFTs with lung volumes; Provide education
    on peak flow self-monitoring; ...</text>
  <entry>
    <observation classCode="OBS" moodCode="INT">
      <code code="23426006" codeSystem="&SNOMEDCT;"
        displayName="Pulmonary function test"/>
    </observation>
  </entry>
  <entry>
    <act classCode="ACT" moodCode="INT">
      <code code="223468009" codeSystem="&SNOMEDCT;"
        displayName="Teaching of skills">
        <qualifier>
          <name code="363702006" displayName="has focus"/>
          <value code="29893006" displayName="Peak flow
            rate measurement"/>
        </qualifier>
      </code>
    </act>
  </entry>
</section>
```

Templated CDA business case

- **Streamlined standards development**

- Reusable building blocks.

- **Streamlined standards implementation**

- Implement once, deploy often.

- **Modular and reusable**

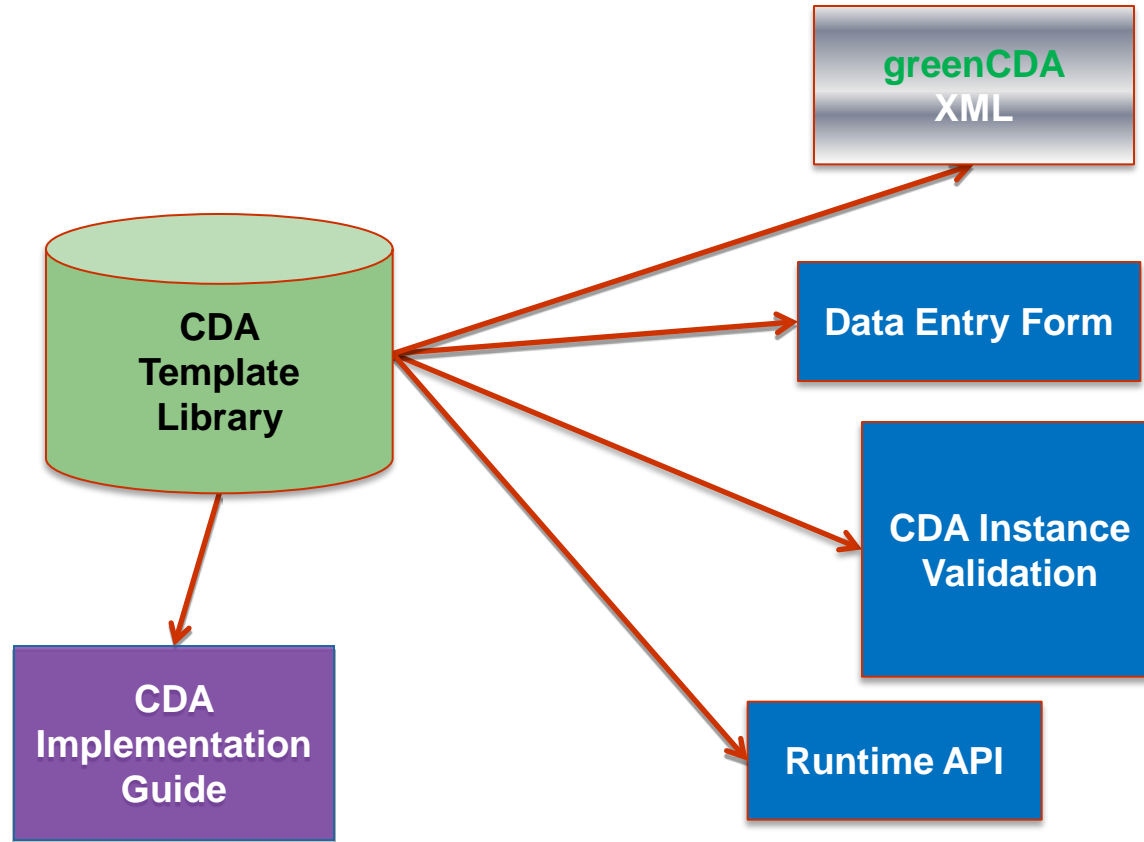
- Templates (e.g., blood pressure, discharge diagnosis) can be repackaged with other templates in any number of CDA implementation guides.

- **Core component of CDA's “incremental interoperability” strategy**

- Begin with simple CDA, and add templates as they are prioritized.

Templates are computable artifacts

Templates are computable artifacts

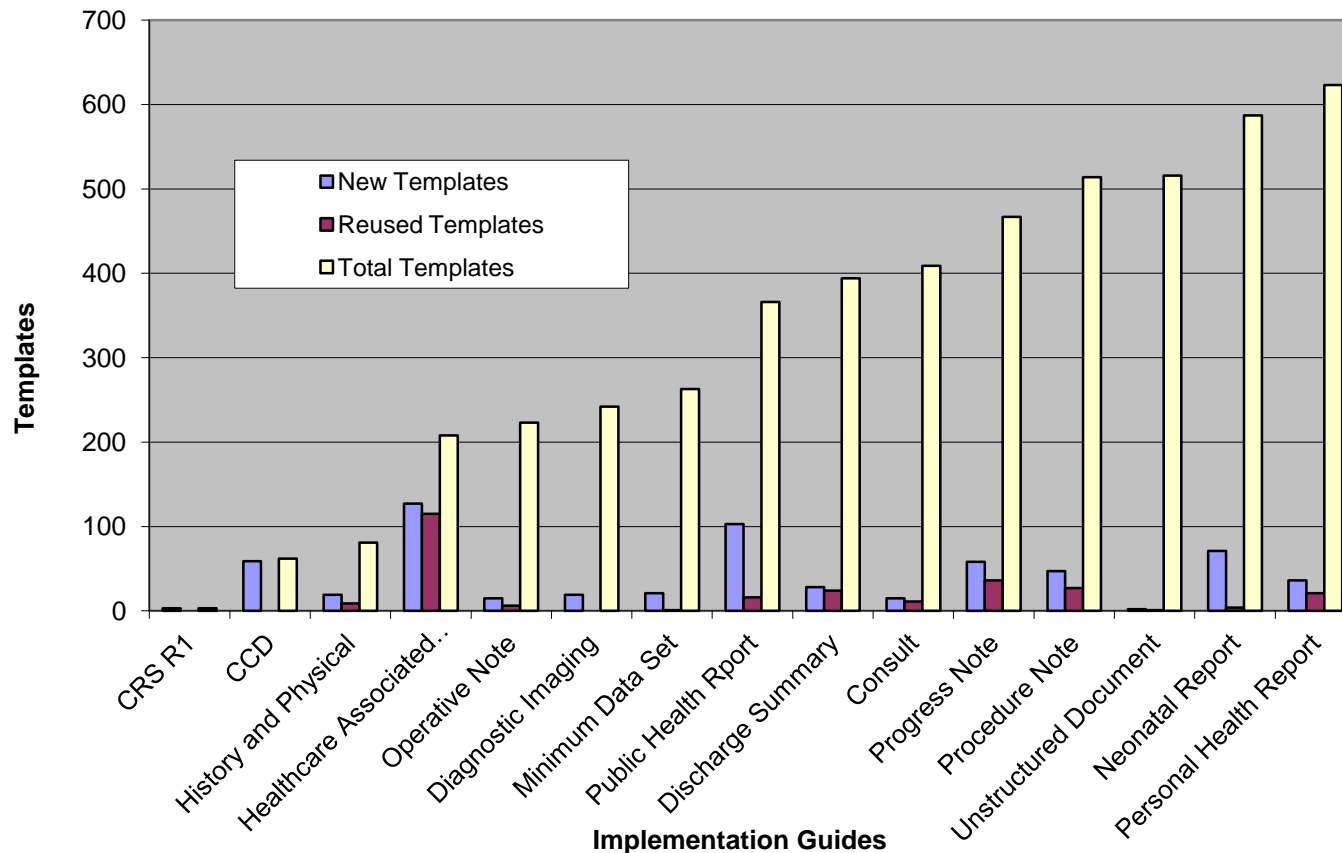


**Support for standards
development**

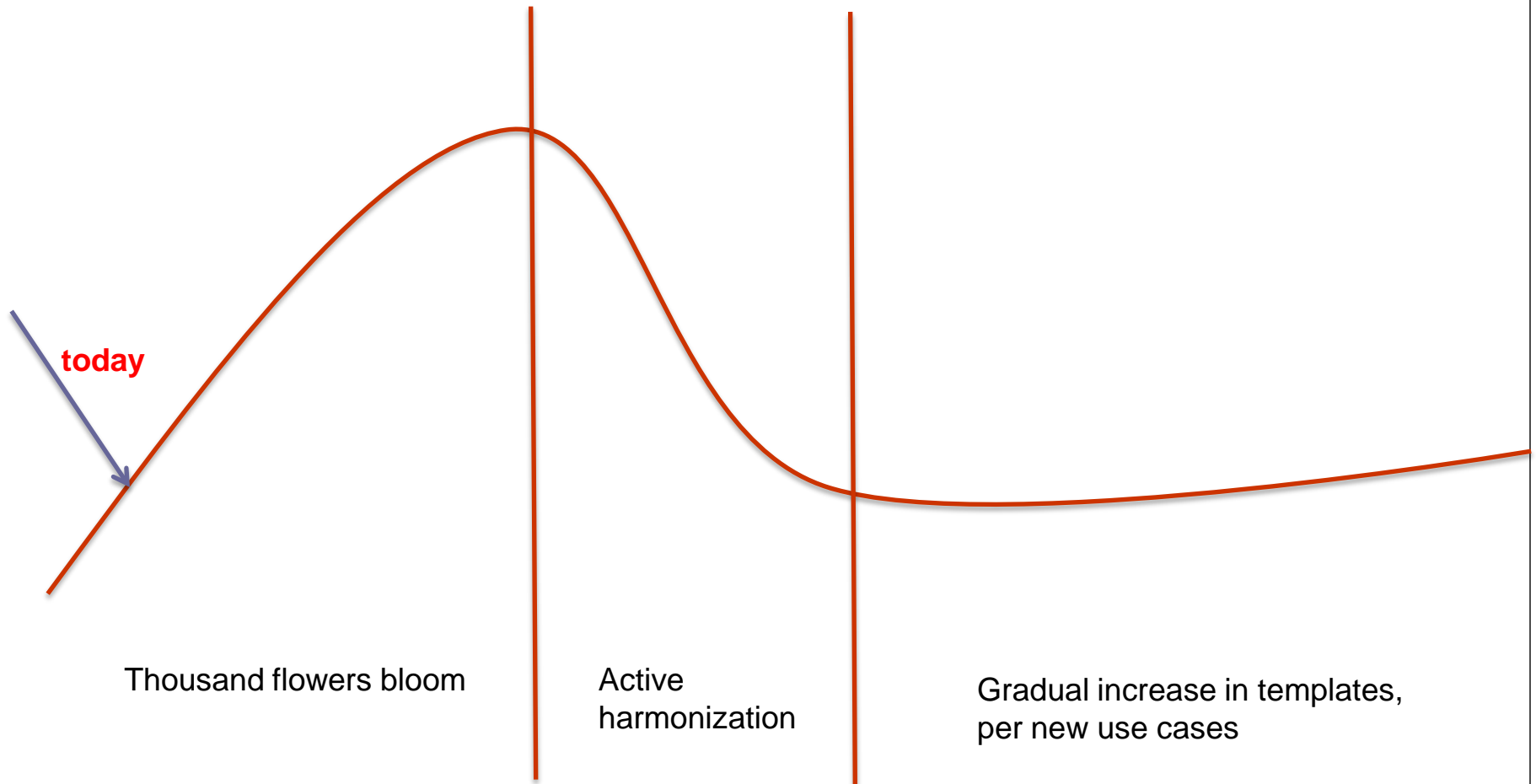
**Support for standards
implementation**

Standards Development

- ~ 42 templates per guide: 24 new, 18 reused.



Standards Harmonization

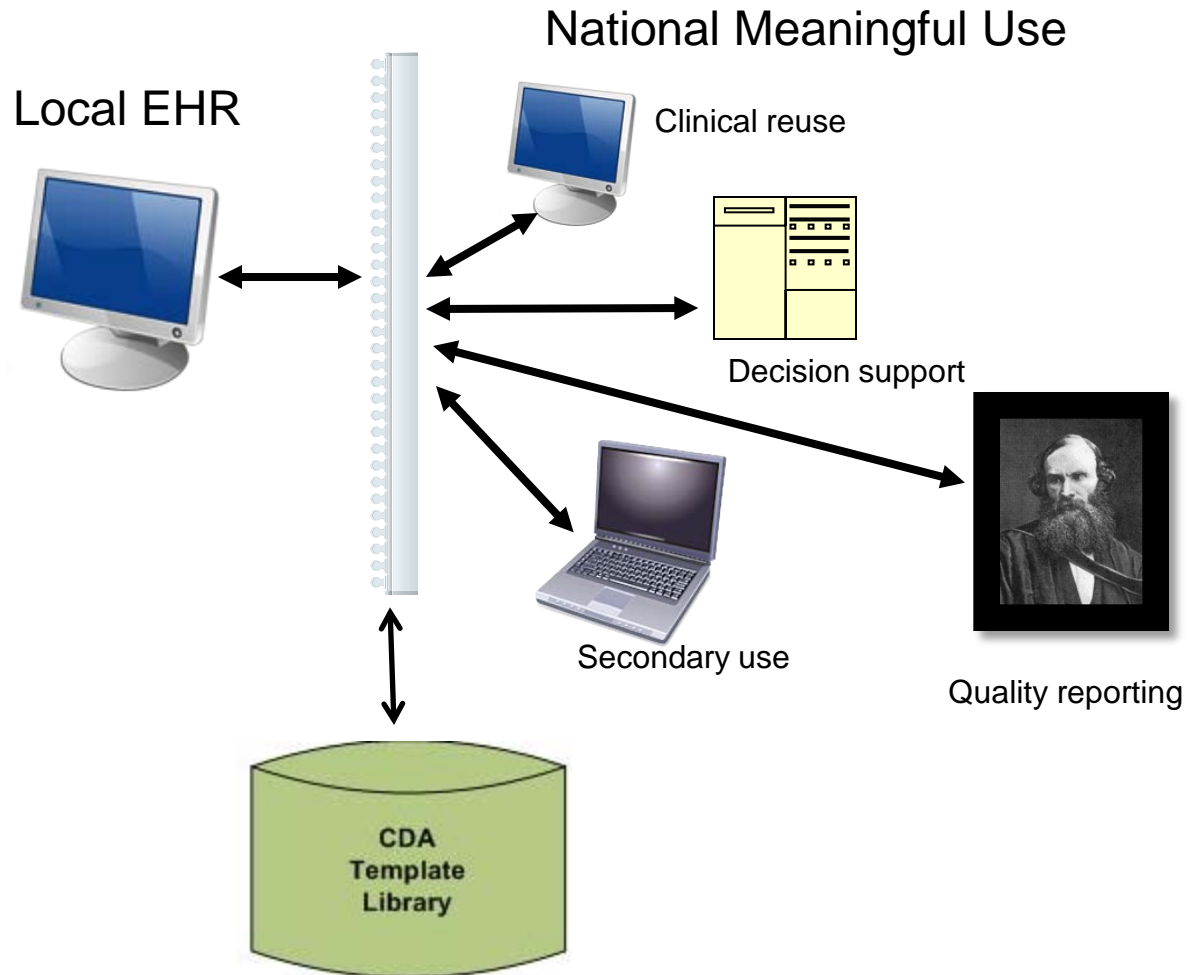


Thousand flowers bloom

Active
harmonization

Gradual increase in templates,
per new use cases

Standard EHR Interface



Templated CDA Interoperability Roadmap

THE MIDQUEST HOSPITAL
DISCHARGE SUMMARY

PATIENT: DOGOOD, LARRY
MR#: A1234567
ACCOUNT #: 1234567

ADMITT
DISC

DISCHARGE MEDICATIONS:
1. ECASA 325 mg po daily (new)
2. Zocor 40mg po daily (new)
3. Atenolol 100mg po daily (increased)
4. Glucophage 850 mg tab, 1 tab po TID
5. Zyrtec 10mg po daily

DISCHARGE DIAGNOSES:
1. Acute Myocardial Infarction s/p CABG.
2. Cardiovascular collapse
3. Hypertension, NOS
4. Diabetes Mellitus, type II
5. Seasonal Allergies

PROCEDURE: CABG, LIMA->LAD, SVG->Circ, SVG->
2/26/07.

HISTORY OF PRESENT ILLNESS: This is a 51 year
history of Hypertension and diabetes admitted
chest pain, and hypotension. Please see the R
details of admission. He was noted to have non-
and positive cardiac enzymes on presentation and
admitt to the U.

Narrative
Text

HL7 CDA Structured
Documents

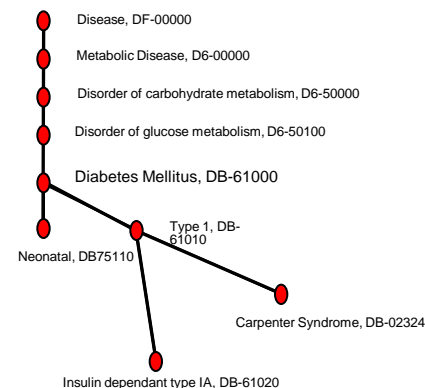
```
<componentOf>
  <encapsulatingEncounter classCode="ENC" moodCode="EVN">
    <id root="1.3.6.1.4.1.2835.12" extension="99370127">
      <code code="99213" codeSystem="2.16.840.1.113883.6.12" codeSystemName="CPT-4"
        displayName="Evaluation and Management"/>
      <effectiveTime>
        <high value="20070220"/>
        <low value="20070220"/>
      </effectiveTime>
      <dischargeDispositionCode code="01" codeSystem="2.16.840.1.113883.6.21" codeSystemName="UB92"
        displayName="Routine Discharge"/>
    </encapsulatingEncounter>
  </componentOf>
  <component>
    <structuredBody>
      <templateId root="1.3.6.1.4.1.11050.10" extension="DMFL_CDAR2_LEVEL1-2REF_US_ID_2005SEP"/>
      <component>
        <section>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.7" extension="HOSPITAL DISCHARGE DX Template"/>
          <code code="11535-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
            displayName="HOSPITAL DISCHARGE DX"/>
          <title>DISCHARGE DIAGNOSES</title>
          <text>
            <paragraph>1. Acute Myocardial Infarction s/p CABG</paragraph>
            <paragraph>2. Cardiovascular collapse</paragraph>
            <paragraph>3. Hypertension, NOS</paragraph>
            <paragraph>4. Diabetes Mellitus, type II</paragraph>
            <paragraph>5. Seasonal Allergies</paragraph>
          </text>
        </section>
      </component>
    </structuredBody>
  </component>
</component>
```

Coded Data
Elements via
Templates

EHR
Repository

Clinical
Applications

SNOMED CT



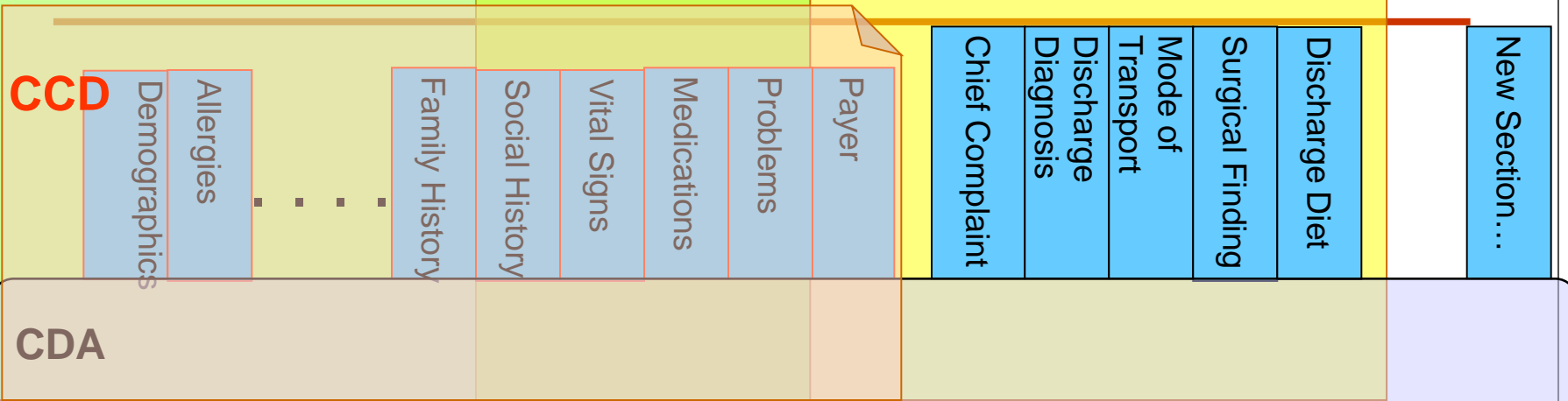
Templated CDA



- Many different kinds of documents.
- A bucket of reusable templates.

**A CDA document
using CCD templates plus others**

A CDA document using CCD templates



Templated CDA Implementation challenge

- Creation of an instance conforming to a particular CDA Implementation Guide may require knowledge of:
 - CDA R2 base specification;
 - HL7 Version 3 data type specification;
 - CDA templates defined in the particular IG;
 - CDA templates referenced by the particular IG;
 - Terminology code lists defined/referenced by the particular IG;
- Validation of an instance conforming to a particular CDA IG may require:
 - W3C Schema validation;
 - Schematron validation;

One solution = Consolidate!

- Consolidated library of reusable CDA templates and common document types:
 - CCD
 - Consultation Note
 - Diagnostic Imaging Report
 - Discharge Summary
 - H&P
 - Operative Note
 - Procedure Note
 - Progress Note
 - Unstructured Document

CDAR2_IG_IHE_CONSOL_R1_D2_2011SEP



Implementation Guide for CDA Release 2.0
Consolidated CDA Templates
(US Realm)
DRAFT
September 2011

Produced in collaboration with:



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Another Solution - **greenCDA**

- Create an “authoring schema” that simplifies the creation and processing of a particular CDA IG:
 - Clinically meaningful XML element and attribute names;
 - 100% transformable into conformant CDA IG;
 - Hides certain CDA complexities (such as moodCodes, fixed attributes, etc).
- We call this strategy: **greenCDA**
 - **greenCDA** schemas are modular, corresponding to CDA templates.

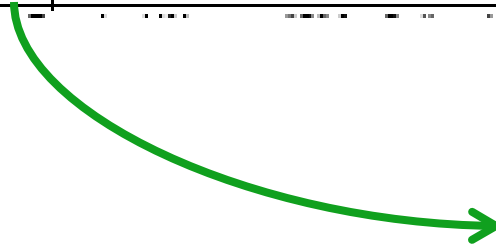
An example – build the **greenCDA** module

Requirements

CDA Data Location	HITSP Data Element Identifier and Name
cda:observation[cda:templateId/@root = '2.16.840.1.113883.10.20.1.31']	Result Event Entry
cda:id	15.01 - Result ID
cda:effectiveTime	15.02 - Result Date/Time
cda:code/@code	15.03 - Result Type
cda:statusCode	15.04 - Result Status
cda:value	15.05 - Result Value
cda:interpretationCode/@code	15.06 - Result Interpretation
cda:referenceRange	15.07 - Result Reference Range

greenCDA schema

```
<result>
  <resultID>
  <resultDateTime>
  <resultType>
  <resultStatus>
  <resultValue>
  <resultInterpretation>
  <resultReferenceRange>
</result>
```



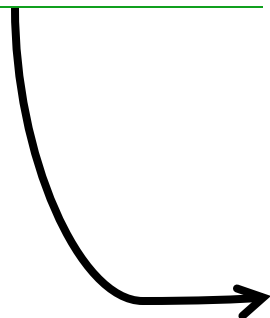
An example – create a conformant instance

greenCDA instance

```
<result>
  <resultID>
  <resultDateTime>
  <resultType>
  <resultStatus>
  <resultValue>
  <resultInterpretation>
  <resultReferenceRange>
</result>
```

Conformant CDA instance

```
<!-- These examples assume the default namespace is 'urn:hl7-org:v3' -->
<observation classCode='OBS' moodCode='EVN'>
  <templateId root='2.16.840.1.113883.10.20.1.31' />
  <templateId root='2.16.840.1.113883.3.88.11.83.15' />
  <templateId root='1.3.6.1.4.1.19376.1.5.3.1.4.13' />
  <code code='...' displayName='...' codeSystem='2.16.840.1.113883.6.1'
codeSystemName='LOINC' />
  <effectiveTime low value='...' />
  <statusCode value='N' />
  <value xsi:type='PQ' value='100' unit='g/dl' />
  <interpretationCode code='N' codeSystem='2.16.840.1.113883.5.83' />
  <referenceRange>
    <observationRange>
      <text>M 13-18 g/dl; F 12-16 g/dl</text>
    </observationRange>
  </referenceRange>
</observation>
```



CDA template tools

MDHT CDA Tools - Mozilla Firefox

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MDHT CDA Tools

http://www.cdtools.org/

Model Driven Health Tools

Model-Driven Health Tools (MDHT) CDA Tools

This web site contains demonstrations and other reference documents from the [Open Health Tools \(OHT\)](#) [Model-Driven Health Tools \(MDHT\)](#) project.

- [MDHT CDA Tools User Guide](#)
Documentation on creating, editing, and generating Java code from CDA models.
- [Validate CDA instances](#)
Example web application that validates CDA instances. Supports models defined in the above implementation guides. All validation rules are executed as Java and OCL code generated from the UML models.
- On-line implementation guides for CDA template models.

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Contact: Andrea Ribick
+1 (734) 677-7777
andrea@HL7.org

HL7 Releases New Tool for Capturing, Storing and Managing CDA® Templates

"Trifolia Workbench" Beta Release supports standards development and localization; includes library of meaningful use templates

Ann Arbor, Michigan, USA – July 19, 2011 – Health Level Seven® International (HL7®), the global authority for interoperability and standards in healthcare information technology with members in 55 countries, today announced the release of the Trifolia Workbench: Consolidation Project Edition 1.0, Beta Release. This release supports standards authors, developers and implementers in capturing, storing and managing HL7 Clinical Document Architecture (CDA) templates. It contains the full set of templates balloted through the [HL7/IHE Health Story Consolidation Project](#), which harmonized health information exchange specifications for meaningful use of EHR technology. The project covered the HL7 Continuity of Care Document (CCD®) and the [Health Story](#) implementation guides for Discharge Summary, six other types of

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http://emi.inflow-integration.ca/products/interoperability_solutions

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Products

The Inflow Interoperability Solutions allow developers to implement interfaces to the electronic health record (EHR) faster and more efficiently. The solutions include improved documentation for developers and an open source plug-in for receiving and sending standards-based interoperability messages.

Inflow Message Builder

Inflow Message Builder allows developers to focus on the business challenges of integrating their solutions with each electronic health record implementation by abstracting the differences between different versions of pan-Canadian HL7 messaging and supporting current implementation constraints. Developers can build interfaces in a familiar development environment, using the programming language of their choice*, while the Message Builder API fosters quick and easy creation, population and access to HL7v3 requests and responses.

Inflow Message Builder offers a number of key features and benefits:

- Abstracts the complexity of HL7v3 messages and greatly simplifies the work of the developer when implementing them;
- Reduces the impact on developers from implementation variations;
- Enables companies to achieve Inflowway product certification with greater confidence and reduced time;
- Enables developers to incorporate future message versions without re-writing their products;

Thank you!

