The OLAC Metadata Set and Controlled Vocabularies

Steven Bird
Penn

Gary Simons
SIL

Types of Language Resource

DATA: any information which documents or describes a language, such as a:

- monograph, data file, shoebox of index cards, unanalyzed recordings, heavily annotated texts, complete descriptive grammar

TOOLS: computational resources that facilitate creating, viewing, querying, or otherwise using language data

- includes fonts, stylesheets, DTDs, Schemas

ADVICE: any information about:

- reliable data sources, appropriate tools and practices

The Language Resources Community

Creators and Users of Language Resources:

- speakers, educators, linguists, technologists

Immediate Infrastructure:

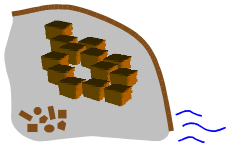
- archivists, software developers, publishers

Sponsors & Promoters:

- professional associations, funding agencies, non-governmental organizations

Scale: tens of thousands of people

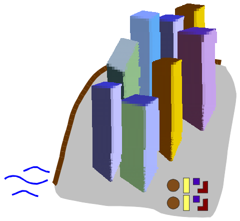
Now: Underdevelopment



- The building blocks
  - data, formats, tools, interfaces
  - diversity & incompatibility
  - *the pieces fit together poorly*
- Resource discovery
  - "word of mouth" (e.g. CORPORA)
  - search engines
  - *low precision and recall*
- Architecture
  - small, unstable, unscalable
  - exchange and reuse of "primary materials"
  - *diversity is restricted*

Future: Development

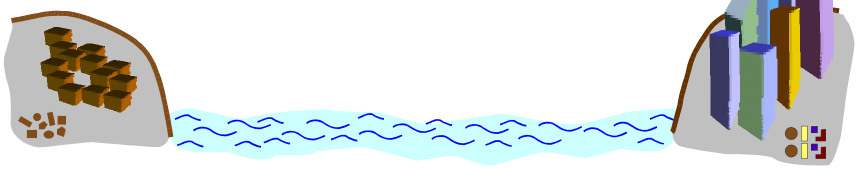
- The building blocks
  - data, formats, tools, interfaces
  - diversity with compatibility
  - *the pieces fit together well*
- Resource discovery
  - resources in federated archives
  - common finding aids
  - *high precision and recall*
- Architecture
  - large, stable, scalable
  - aggregation and integration of complex structures and services
  - *diversity is facilitated*



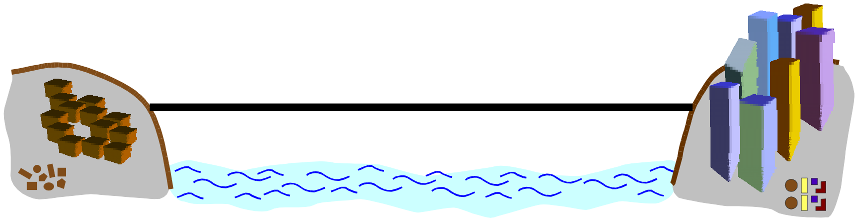
Three Approaches to Bridging the Gap

1. Monolithic ☆
2. Independent ☆
3. Coordinated ✙

The Gap



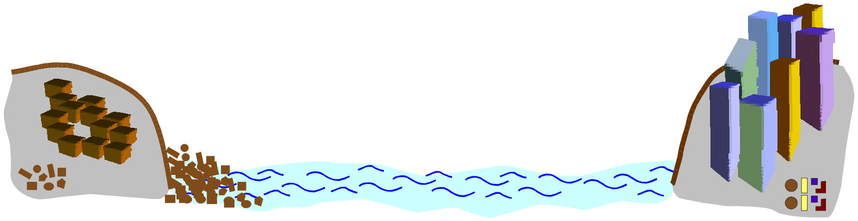
Monolithic Approach



"One day, a single, massive project will succeed in bridging the gap"

Analogy: a centralized database as a complete information system

Independent Approach



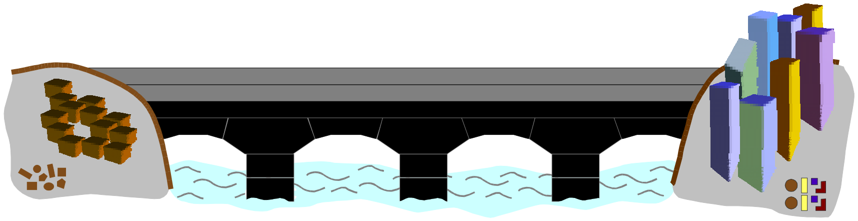
"Given enough time, the accretion of independent initiatives will bridge the gap"

Analogy: the world-wide web as a complete information system

The Foundation: 3 initiatives

1. Dublin Core Metadata Initiative (DC)
   - founded in 1995 (Dublin, Ohio)
   - conventions for resource discovery on the web
2. Open Archives Initiative (OAI)
   - founded in 1999 (Santa Fe)
   - interoperability of e-print services
3. Open Language Archives Community (OLAC)
   - founded in 2000 (Philadelphia)
   - a partnership of institutions and individuals
   - creating a worldwide virtual library of language resources

Coordinated Approach



"A shared architectural vision, having many components, and implemented in stages by the community, will bridge the gap"

Analogies: federated databases; semantic web

Foundation 1: DC Elements

15 metadata elements:

- broad interdisciplinary consensus
- each element is optional and repeatable
- applies to digital and traditional formats
- Title, Creator, Subject, Description, Publisher, Contributor, Date, Type, Format, Identifier, Source, Language, Relation, Coverage, Rights.

dublincore.org

Foundation 1: DC Qualifiers

Encoding Schemes:

- a controlled vocabulary or notation used to express the value of an element
- helps a client system to interpret the element content
- e.g. Language = "en" (not "English", "Anglais", ...)

Refinements:

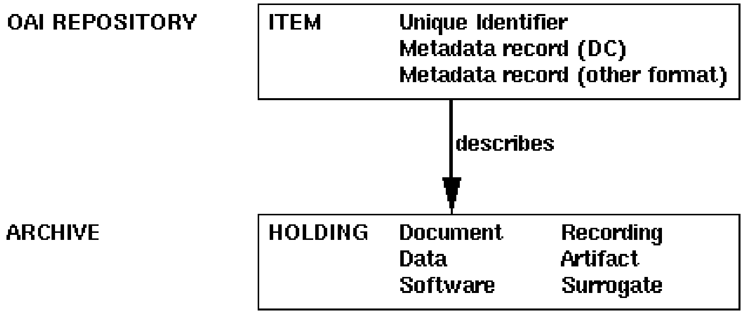
- makes the meaning of an element more specific
- e.g. Subject.language, Type.linguistic

Foundation 2: OAI Standards

To implement the OAI infrastructure, an archive must comply with two standards:

1. The OAI Shared Metadata Set
   - Dublin Core
   - interoperability across all repositories
2. The OAI Metadata Harvesting Protocol
   - HTTP requests - 6 verbs:
     - Identify, ListIdentifiers, ListMetadataFormats, ListSets, ListRecords, GetRecord
   - XML responses

Foundation 2: OAI Repository



OAI REPOSITORY

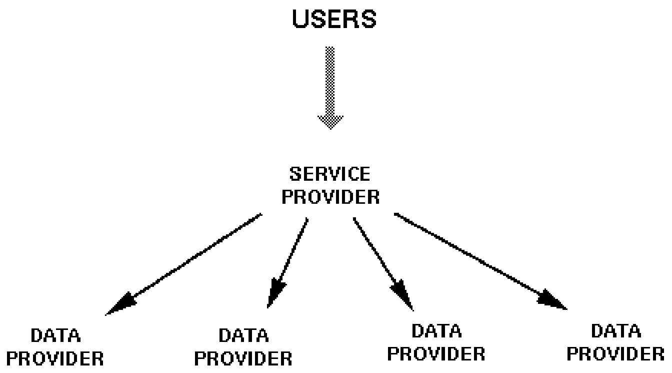
ITEM — Unique Identifier, Metadata record (DC), Metadata record (other format)

describes

ARCHIVE

HOLDING — Document, Data, Software, Recording, Artifact, Surrogate

Foundation 2: OAI Service Providers and Data Providers



USERS

SERVICE PROVIDER

DATA PROVIDER

DATA PROVIDER

DATA PROVIDER

DATA PROVIDER

Foundation 3: OLAC

OLAC was founded at the *Workshop on Web-Based Language Documentation and Description* (Philadelphia, 2000)

- sponsored by NSF: TalkBank, ISLE, IRCS
- 100 participants:
  - computational linguists, descriptive linguists, archivists
  - N America, S America, Europe, Africa, Middle East, Asia, Australia

Foundation 3: OLAC Aims

OLAC, the Open Language Archives Community, is an international partnership of institutions and individuals who are creating a worldwide virtual library of language resources by:

- developing consensus on best current practic for the digital archiving of language resources;
- developing a network of interoperating repositories and services for housing and accessing such resources.

Aside: OLAC Organization

- **Coordinators:** Steven Bird & Gary Simons
- **Advisory Board:** Helen Aristar Dry, Susan Hockey, Chu-Ren Huang, Mark Liberman, Brian MacWhinney, Michael Nelson, Nicholas Ostler, Henry Thompson, Hans Uszkoreit, Antonio Zampolli
- **Participating Archives & Services:** LDC, ELRA, DFKI, CBOLD, ANLC, LACITO, Perseus, SIL, APS, Utrecht
- **Prospective Participants:** ASEDA, Academia Sinica, AISRI, INALF, LCAAJ, Linguist, MPI, NAA, OTA, Rosetta, Tibetan Digital Library
- **Working Groups:** 5 set up at Philadelphia workshop - but focus has been on infrastructure and metadata
- **Individual Members: ~120**

Foundation 3: OLAC & OAI

Recall: OAI data providers must support:

- Dublin Core Metadata
- OAI Metadata harvesting protocol

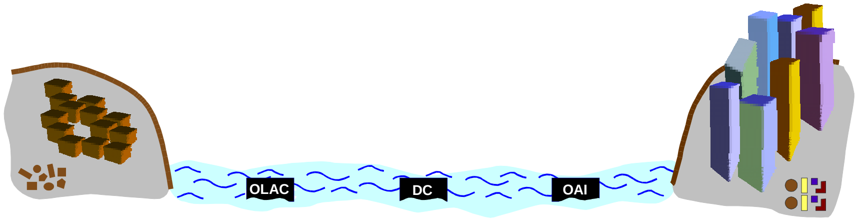
BUT: OAI data providers can support:

- a more specialized metadata format
- a more specialized harvesting protocol

What OLAC does:

- specialized metadata for language resources
- specialized harvesting (extra validation)

Summary: Three Initiatives Provide the Foundation



The OLAC Metadata Set

The three categories of metadata:

- Work language: describes information entitites and their intellectual attributes
  - e.g. names of works and their creators
- Document language: describes and provides access to the physical manifestation of information
  - e.g. format, publisher, date, rights
- Subject language: describes what a document is about
  - e.g. subject, description

cf: Svenonius (2000) The Intellectual Foundation of Information Organization (MIT Press)

Next Layer: OLAC Standards

Aside:

- standards = the protocols and interfaces that allow the community to function
- recommendations = "standards" for representing linguistic content

OLAC has three primary standards:

- *OLACMS:* the OLAC Metadata Set (Qualified DC)
- *OLAC MHP:* refinements to the OAI protocol
- *OLAC Process:* a procedure for identifying Best Common Practice Recommendations

OLACMS Work Language

e.g. Creator:

- Def: An entity primarily responsible for making the content of the resource
- Text to name the creator
  - e.g. BCP: "Surname, Firstname"
- Refinement to Dublin Core: OLAC-Role
- OLAC-Role is a *controlled vocabulary*
  - *author, editor, translator, transcriber, sponsor, ...*

OLACMS Document Language

e.g. Format.markup:

- Def: The OAI identifier for the definition of the markup format
- references the DTD, Schema, or some other definition of the markup format
  - e.g. oai:nist:timit86
- For software: supported markup formats
- Consequences:
  - Ensures that format definitions are archived
  - Queries can do a join to find data of a given type for which software is available

OLACMS: Subject Language

E.g. Subject.language

- Def: A language which the content of the resource describes or discusses
- Starting points:
  - ISO 639, LANGIDs, RFC-3066 (1766), Ethnologue
- Unicode Consortium & IETF
  - aware of shortcomings of RFC-3066
  - want to incorporate Ethnologue codes
- Current proposal being considered
  - 4-letter codes (Ethnologue 3-letter codes plus prefix)
  - where an unambiguous 2 or 3-letter code exists, use it, and drop the Ethnologue equivalent
- Other developments:
  - LINGUIST Ancient Languages: x-ll-xakk = Akkadian
  - UCSB workshop discussed *Language Code Consortium*

OLACMS: Subject Language

E.g. Type.lingdata (was type.data)

- Def: The nature or genre of the content of the resource, from a linguistic standpoint.
- *Difficult - "CL does not yet have a systematics or classification scheme" (Uszkoreit)*
- Encoding scheme: OLAC-LingData (OLAC-Data)
- Primary classification:
  - transcription: a time-ordered symbolic representation of a linguistic event
  - annotation: any kind of structured linguistic information that is explicitly aligned to some spatial and/or temporal extent of a linguistic record
  - description: any description or analysis of a language (structure is independent of the linguistic events)
  - lexicon: any record-structured inventory of forms

OLACMS: Subject Language

E.g. Secondary classification for transcription

- transcription/orthographic
- transcription/phonetic
- transcription/prosodic
- transcription/morphological
- transcription/gestural
- transcription/part-of-speech
- transcription/syntactic
- transcription/discourse
- transcription/musical

OLAC MHP 1: Representing the Metadata

See Figure 5 in the proceedings paper

Refinements:

```
<Creator refine="Author">Bateman, John</Creator>
```

Encoding scheme:

```
<Format.os code="Unix/Solaris"/>
```

Language:

```
<Description lang="fr">Une description de la resource ecrit
  en Francais</Description>
```

Header:

```
xmlns="http://www.language-archives.org/OLAC/0.3/"
```

OLAC Process

Lays out the core values of OLAC:

- openness, consensus, empowering the players, peer review

Describes the organization of OLAC:

- coordinators, advisory board, participating archives and services, prospective participants, working groups, participating individuals

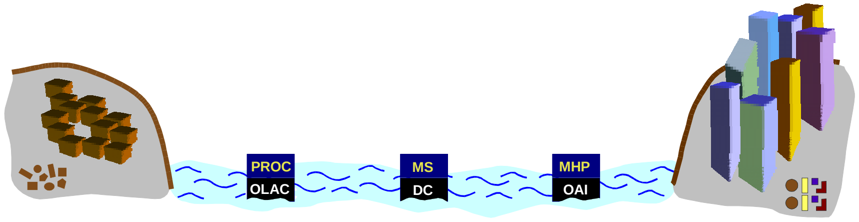
Defines processes for documents and working groups

http://www.language-archives.org/OLAC/process.html

OLAC MHP 2: Refinements to OAI Protocol

1. Identify
   - specify the format of the archive self-description field
2. ListMetadataFormats
   - specify tha OLAC is one of the returned formats and that the URL points to the canonical schema
3. ListIdentifiers
   - when OLAC is specified as the required metadata format, ensure that the repository returns at least one record identifier

Summary: Three Standards Define the Community



■ Initiatives
■ Standards

Third Layer: OLAC BCPs

Recommendations for appropriate use

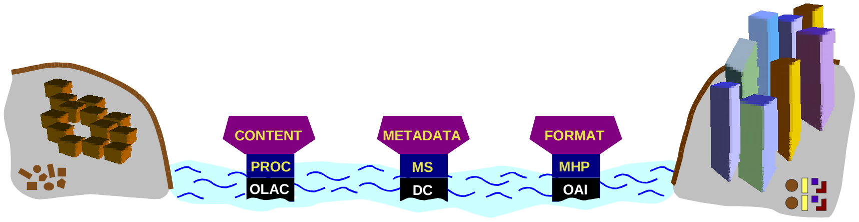
1. OLAC Metadata Set:
   - e.g. don't abbreviate association names:
     - <publisher>Association for Computational Linguistics</publisher>
2. OLAC MHP:
   - e.g. where possible map a language designation to a code in OLAC-Language, instead of freeform text
3. OLAC Process:
   - e.g. use such-and-such an XML format for archiving wordnets

Fourth Layer: Software

Beginning with any kind of language resource, there will be software to:

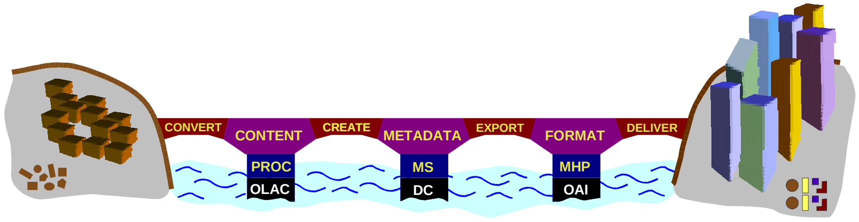
- convert it to archival format (if possible)
  - e.g. replace legacy fonts with Unicode
- create a metadata record
  - e.g. LDC's metadata lives in an Oracle database
- export this record to XML
  - "publish" the record in the OLAC format
- harvest the record
  - service provider software to retrieve the record and present it to end-users

Summary: Standards are Supplemented with Community Favoured Syntax and Semantics



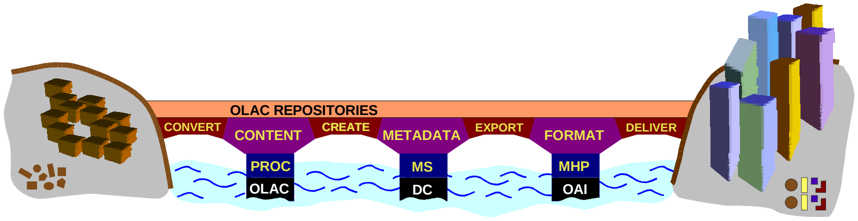
■ Initiatives
■ Recommendations
■ Standards

Summary: With the software in place, we have a complete platform



■ Initiatives
■ Recommendations
■ Standards
■ Software

Summary: Repositories completely bridge the gap, letting us consistently organize and archive our resources



⬛ Initiatives
🟦 Standards
🟪 Recommendations
🟥 Software

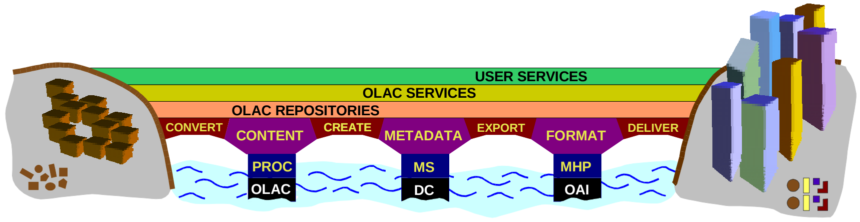
Sixth Layer: OLAC Services

1. Metadata Validation
   - a public interface which permits humans and machines to verify that a putative OLAC record is valid
2. Registration Server
   - tests for OAI membership
   - tests conformance with the MHP:
     - responses to verbs, metadata validation
   - creates a record for the repository: service providers can discover what repositories exist
3. Archive Summarization
   - archive self-description, statistics

Seventh Layer: User Services

1. Union Catalog
   - a single place to query all participating archives
   - LINGUIST will host the primary service provider, guaranteed to be complete
2. Peer Review
   - all archive records and holdings will be open for signed peer review
   - will provide community recognition for resource creation work
3. Interface for metadata submission
   - a proliferation of small repositories
   - create some XML and submit the URL

Summary: Seven Layers Complete the Bridge

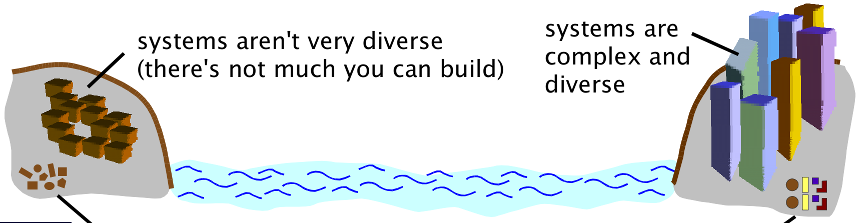


⬛ Initiatives
🟦 Standards
🟪 Recommendations
🟥 Software

Potential Criticisms 1

Aren't you converting the bazaar into a cathedral?

- it wasn't a bazaar - there were no universal currencies or languages
- it won't be a cathedral - the result will be more diverse than what we began with



Moving Forward...

The Coordinated Approach:

"A shared architectural vision, having many components, and implemented in stages by the community, will bridge the gap"

Do you share this vision?

NO: what do we need to discuss or change?

YES: how do you want to participate?

- set up a repository (join OLAC-Implementers)
- sign up as an individual (join OLAC-General)
- help set up the controlled vocabularies (join or create a working group)

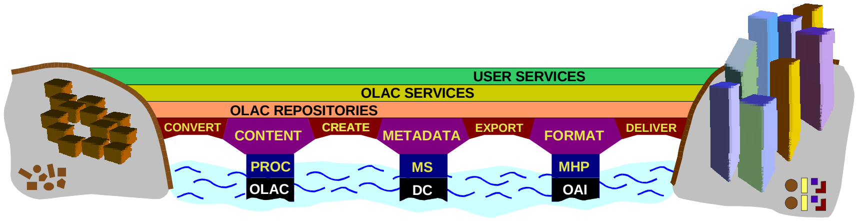
Potential Criticisms 2

There's too much infrastructure here - it will be impossible to get started!

- Metadata elements are all optional
- The MHP is lightweight (CGI + simple XML)
- open source implementations are available (Perl, PHP, Java, XSLT)
- OLAC already has 10 participating repositories (i.e. we've prototyped many parts of the bridge)

Come and see the demo! (this workshop)

OLAC



⬛ Initiatives	🟪 Recommendations
🟦 Standards	🟥 Software

Acknowledgements: ISLE and TalkBank projects (NSF), participants of the Philadelphia workshop, Eva Banik (programmer), Hernando de Soto (the analogy)