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Title

Sharing Metadata: Building Collections and Communities

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Sharing Metadata: Building Collections and Communities

- Robin Chandler, UC San Diego Libraries
- Brad Westbook, UC San Diego Libraries
- Kevin Rundblad, UCLA
- Presented at Annual Meeting of the Society of California Archivists, Riverside, CA, May 9, 2009

Libraries, archives, and museums cannot afford to think about collections only in the context of the local community. Sharing benefits our users, and we can no longer assume our users will come in through the "front door." Cultural institutions must get their content "into the flow" where working users will discover and reap the benefits of digital content delivery. The speakers in this session will describe the benefits of creating repurposable metadata discoverable in multiple environments; discuss some of the obstacles challenging institutions to create sharable metadata; compare two mechanisms for creating repurposable metadata; and share some success stories where leveraging metadata in social networking environments helped users discover the breadth and depth of an institution's collections.

Sharing Metadata: Building Collections, Community & Computing Power

Robin L. Chandler Society of California Archivists May 9, 2009



- •Major Theme:
 - •Metadata Standards are the key to Sharing Metadata
- •Repositories amass collection metadata in local databases *locked* away from the internet public in Data Silos
- •Standardized metadata is flexible, shareable and promotes interoperability
- •Minor Theme
 - Tear Down your Data Silos & Share Your
 Metadata

"Shareable metadata is metadata which can be understood and used outside of its local environment by aggregators to provide more advanced services"

Sara Shreeves Moving Towards Shareable Metadata



What's Wrong with Data Silos?





Data SILOS Freeze Innovation

- Our users are innovators
- "Innovation
 comes only from
 readily & seamlessly
 sharing information
 rather than from
 hoarding it" Tom
 Peters, author In Search
 of Excellence



Why Share Our Metadata?

- Sharing Benefits our users
 - Data must be where users are working -- getting "Into the Flow"
 - Federates distributed collections
 - Supports "one-stop" searching
 - Supports Web 2.0 culture and services

Sharing Benefits our institutions

- Increases exposure to collections
- Broadens user base
- Increases potential for collaboration & grant seeking opportunities
- Enhances rather than limits your data





1877 – Standardization of size of catalog cards

1901 – LC catalog card distribution program

1968 - MARC

1971 - OCLC

1980 - RLIN

1987 - Z39.50

1994 – DCMI (Dublin Core Metadata Initiative)

1997 - MARC 21

1998 - EAD 1.0

2001 – OAI-PMH; METS; MODS

2004 - Web 2.0

2007 - OAI-ORE

Evolution of Sharing: Analog to Web 2.0

- Analog: Sharing the Creation of Authoritative Catalog Records
 - •Librarian expert creates a catalog record and shares the record with other Librarian experts
 - •Motives:
 - •Encourages shared cataloging & conserving staff resources
 - Encourages cooperative collection development
- •Web 2.0: Sharing the Production of Knowledge
 - •Archivist expert creates an interoperable digital object with standardized metadata and shares the object with users
 - •Motives:
 - •Increase exposure of collections
 - Encourage metadata enhancement by distributed experts
 - •In socially networked environment, expert users enhance digital object with additional metadata. This is joint authorship using the distributed expertise of human computing power.



Key attributes to shareable metadata:

- Human understandable outside of its local context
- Provides contextual information at the object level
- Consistent across a collection: uses same data fields and same controlled vocabulary across a collection
- Easily packaged in multiple views for multiple audiences
- Machines can process
- •Uses Standards: descriptive, technical, administrative



What is a standard?

"a description of a measurable item or process" which is agreed upon and published by recognizable standardsissuing organization such as national and international associations."

"Standards are used to assure that communication is clear. The use of a recognized industry standard assures everyone that processes and measurements are uniform."



Senkus, Encyclopedia of Library and Information Science, 2003, p. 2,737.

"Clear thinking about what we are doing with description is essential to creating useful tools and delivering them in a helpful and understandable format."

--Michael Fox 2000 SAA Presentation





Types of Standards

Туре	Definition	Example
Content	How descriptive data is expressed	DACS
Value	How descriptive content is controlled	LCNAF, LCSH, AAT
Structure	Specification of the elements of description, technical and administrative metadata and their relationship to one another	MARC, MODS, DC, VRA, MIX, PREMIS etc.
Communication	How description is formatted and transmitted	MARC, EAD, METS

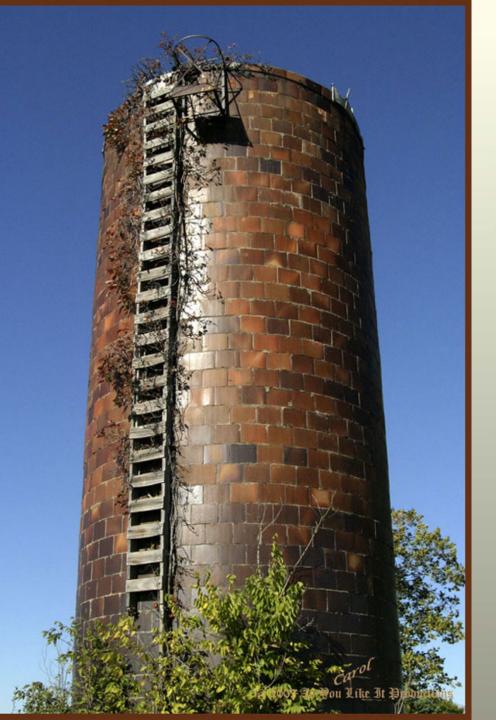
A repository applying metadata standards will create effective metadata records for the

*discovery, *sharing,

and,

*ongoing management of its digital objects.





Data Silos Can Happen Because:

- We lack staff & skills to implement standards
- We perceive our Users as Local Only
- We recognize that storage is cheap
- We believe we can't keep up with dynamic standards



- Data standards are stable....they are the products of thorough intellectual process and are maintained by groups of experts.
- Data standards are also dynamic – evolving in response to community needs.
- Institutions
 customizing standards
 face migration issues
- Leads to local instability as institutions must resolve problems without community solutions

ALA Tiaga Forum Provocative Statements Discussion, 2006

"Within the next five years....."

- •The continuing disaggregation of content from original containers causes a revolution in resource discovery
- •There will no longer be a monolithic "library" Web site....instead, data will be pushed out to many starting places on the Web and directly to users
- •All information discovery will begin at Google, including discovery of "archival" resources



Ithaka's 2006 Studies of Key Stakeholders in the Digital Transformation in Higher Education, 2008

- Since 2003, the number of scholars across disciplines who report starting their research at non-library discovery tools, has increased
- Over 90% of librarians list the gateway /portal role as very important
- There is a disconnect!







Library of Congress Working Group on the Future of Bibliographic Control, 2008

- Recommends making EAD finding aids accessible via online catalogs and internet
- Encourages inter-institutional collaboration for sharing metadata records



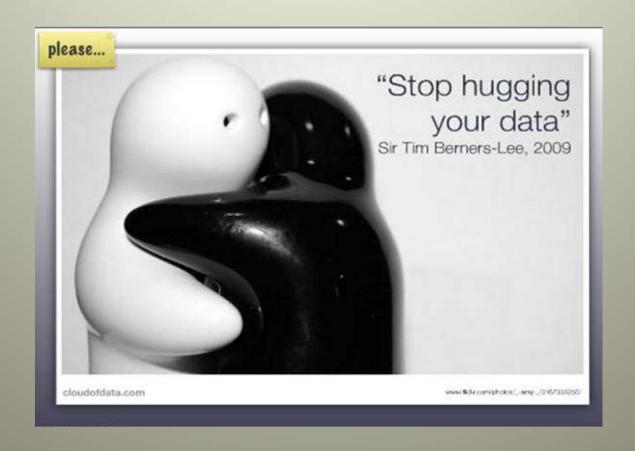
CLIR's Cataloging Hidden Special Collections and Archives Program, 2009

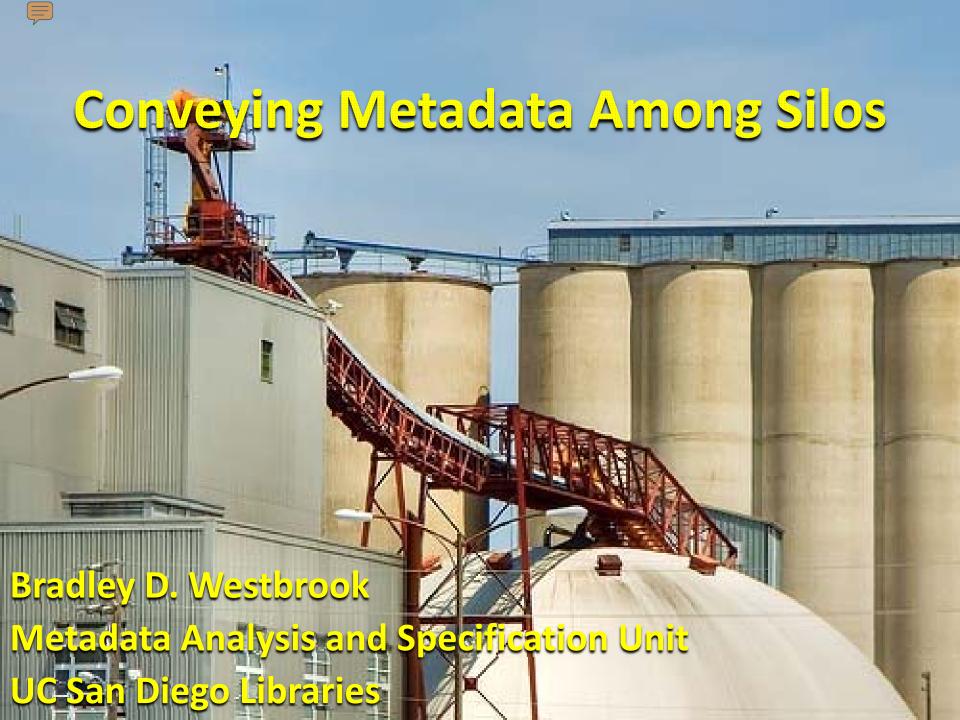
"Applicants will be expected to base their proposals on technical solutions that already exist for swift and efficient entry of data which can be translated into standard records formats such as EAD and MARC"



Thank You!

rochandler@ucsd.edu





Overview

Reframing the "silo" problem

Challenges for metadata sharing

Tools / methods for metadata sharing

The problem of metadata synchronicity

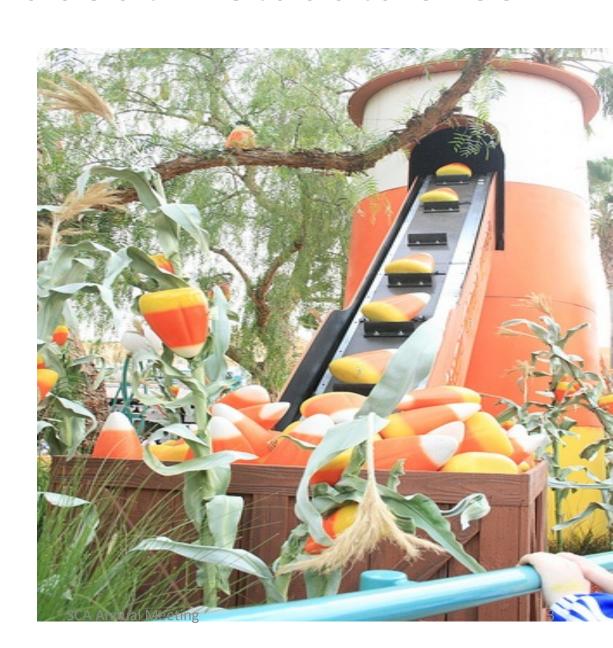


Some facts about metadata silos

Inevitable

Ubiquitous

Beneficial





What's good about metadata silos?

Metadata silos share core purposes



IFLA Study Group on the Functional Requirements for Bibliographic Records (1997)

So what's the problem?

It is the conveyance, or transmission, of metadata. In a word, the "shareability" of metadata.

What is needed is better understanding of what is involved in sharing metadata, or conveying it from one silo to another, and development of techniques and processes that will promote metadata sharing in a manner both beneficial and cost-effective.



What's so important about sharing?

Efficiency

Increased access

New data products

Professionalism



Challenges for metadata sharing

Increasingly complicated data environment

Transformation barriers



Increasingly complicated metadata environment.

- Book catalogs
- AACR and card catalogs
- Multiple content standards for different kinds of objects and functions
- Multiple format standards for communicating metadata
- Intersecting but bounded knowledge consuming / producing communities

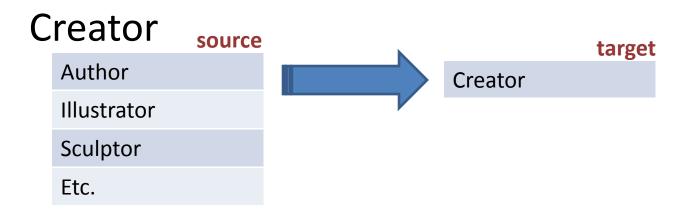
Transformation barriers

Inequalities among standards create barriers when conveying metadata from one environment to another.

Kinds of Inequalities

- Specific to general
- Differences in data format / values
- One-to many (splitting)
- Many to one (aggregation)
- Structural differences
- Missing data
- Superfluous data

Specific to general



Subject

source (marc)

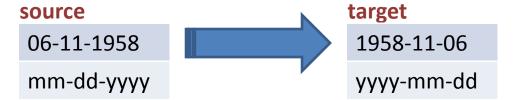
650 O Northern elephant seal|xGeographical distribution |zSouthern California Bight (Calif. and Mexico)

target (dc)

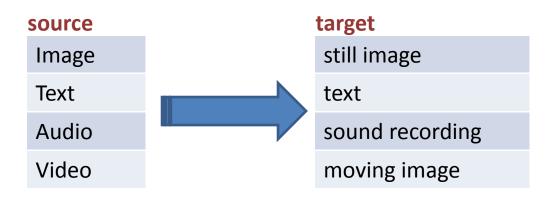
<a hr

Format / value differences

Syntax



Vocabulary file types:



One to many

The value of a single source element is divided into multiple elements in the target schema:

source (local database)



Submarine valleys; Ocean bottom; Marine Sediments; Scientific

Expeditions—Mexico

processing: Multiple values are separated by a semicolon in the database, these should be separated and each value put into a separate <mods:genre> element.

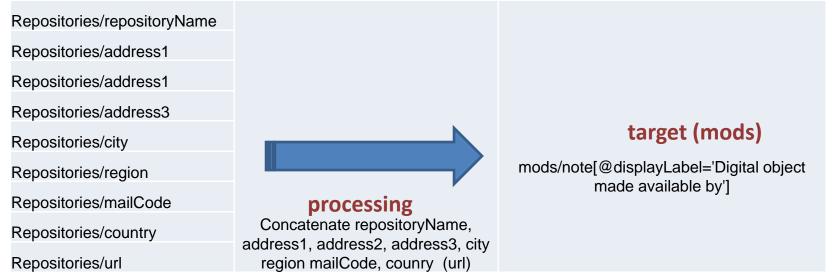
target (dc)

- <dc:subject>Submarine valleys</dc:subject>
- <dc:subject>Ocean bottom</dc:subject>
- <dc:subject>Marine Sediments</dc:subject>
- <dc:subject>Scientific Expeditions -- Mexico</dc:subject>

Many to one

The values of multiple source elements are combined into a single target element.

source (database)



<note displayLabel="Digital object made available by"> Mandeville
Special Collections Library, University of California, San Diego, La
Jolla, CA 92093-0175 (http://orpheus.ucsd.edu/speccoll/)

Structural difference

Hierarchical

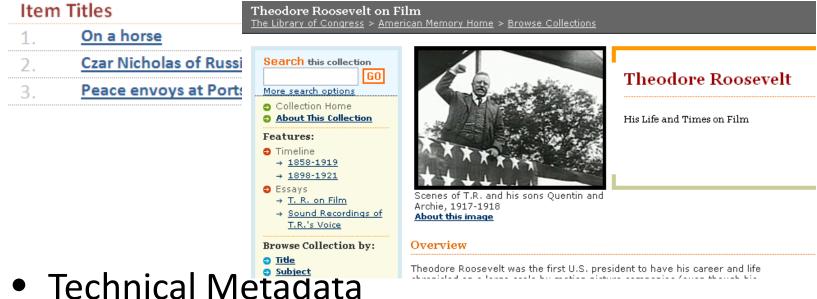
```
<mods xsi:schemaLocation="http://www.loc.gov/mods/v3 http://w
<relatedItem type="constituent">
   <titleInfo>
    <title> Report to the Commissioner of the Federal
      Public Housing Authority</title>
   </titleInfo>
  <identifier type="ARK">
    http://ark.cdlib.org/ark/13030/hb50000652/FID28
  </identifier>
</relatedItem>
<relatedItem type="constituent">
    <titleInfo>
      <title> Minutes from Housing Authority meeting</title>
    </titleInfo>
    <identifier type="ARK">
      http://ark.cdlib.org/ark:/13030/hb50000652/FID15
    </identifier>
 </relatedItem>
</mods>
```

```
<dc xsi:schemaLocation="http://www.cdlib.org/schemas/xmldata.http://ark.cdlib.or</p>
  <relation>Minutes from Housing Authority meeting</relation>
  <relation>
     Report to the Commissioner of the Federal Public Housing Authority
  </relation>
  <id>dentifier>http://ark.cdlib.org/ark:/13030/hb50000652/FID28</identifier></display="block">
  <identifier>http://ark.cdlib.org/ark:/13030/hb50000652/FID15 </identifier> >
</dc>
```



Missing data

Collection Description



to support different system functions, like preservation

Replacing missing data

- Take from collection level metadata or context
- Draw on non-explicit metadata (e.g., organizational practices, workflow documentation, cataloging guidelines)
- Extract from files (mainly for technical metadata)
- Infer from existing metadata (e.g., if a file has an mp3 extension, assign a mime type of audio/mpeg)



Superfluous local metadata

Relevant in the original context of an item but not in its new environment.

Workflow and management metadata, e.g.

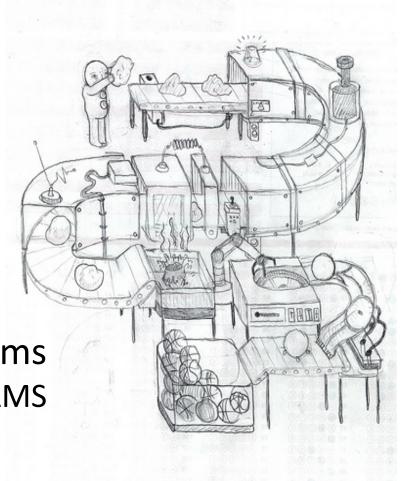
who digitized an item and other work actions accession and stack location information notes about the physical condition of a source item terms used to drive local access mechanisms

Tools / methods sharing metadata

- Basic software programs
 - Excel
 - XML editors
 - XSLT
 - Altova Map Force

 Collection management / metadata authoring systems

- UC San Diego Libraries' DAMS
- Archivists' Toolkit





- Good for visual scanning of data for patterns or disruptions of patterns
- Easy to add data
- Supports a variety of data manipulation
- Find and Replace
 - Concatenation
 - Date formatting
 - A lot more.

Archivists' Toolkit export metadata map

	1 100			D		E	
	2 IF NameType = 3			(first) ArchDeso	<marc:datafield <="" tag="100" th=""><th colspan="2">ed as 700; see below</th></marc:datafield>		ed as 700; see below
	E Names		IE parcanal DirectOrder = True 10		ind1="		
1	100 Source			Processing		occing	Target
1	0001100			Processing R only one (first) Arch Description function =			Target
2	Personal Training a		and FUI	k only one ((IIIX) Archibescription anctical =		
3							<pre><marc:datafield <="" pre="" tag="100"></marc:datafield></pre>
4		5.500.00					ind1="
5	Names	personal Direct Order		variable	IF personalDirectOrder = True		0
6	Names	personalDirectOrder			IF personalDirectOrder = NULL		1
7	Names	nameType			IF nameType	e = family	3
8	n/a	n/a		constant			ind2=" ">
g							!
1		personalPrimaryName personalRestOfName			IF nameType = personal and personalDirectOrder = NULL IF nameType = personal and personalDirectOrder = True		<pre><marc:subfield code="a">personalP</marc:subfield></pre>
				variable			'personalRestOfName
				variable			personancesconvanie
Н	1,3724	personalPrimaryName					Commence of the second
1	Names	personal Rest Of Name					personal Primary Name' 'personal Re
12	Names	familyName			IF nameType = family		familyName' Family'
13							
	>						
	26 Names 27	qualifier	variable	10		<pre><marc:subfield code="g">qualifier</marc:subfield></pre>	
	28	i role variable		25		<marc:subfield code="e"></marc:subfield>	
	29 ArchDescripti			IF role != NULL role ELSE crea SCA Annual Meeting		role creator ng 20	
	30						
	9 May 2009						
	33	33					

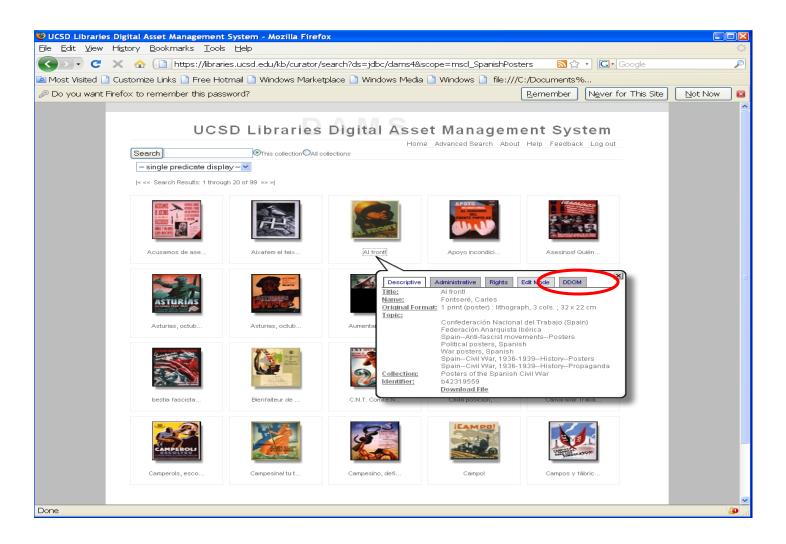




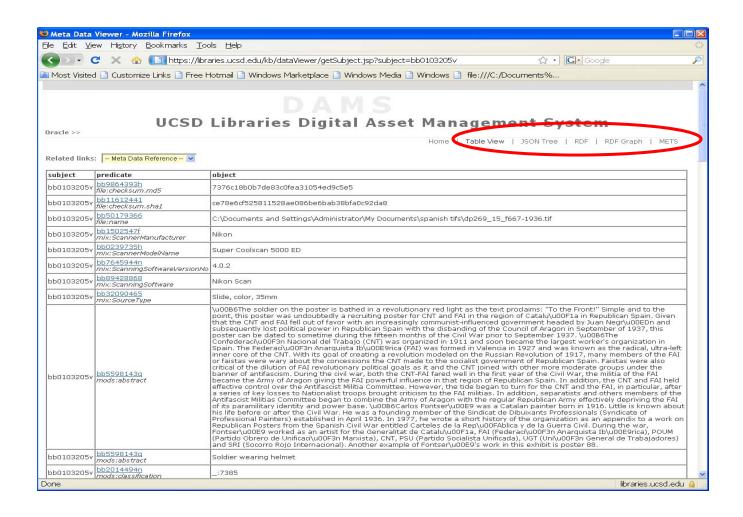
Extensible Stylesheet Language Transformations

- Fortransformation of XML encoded data
- High technical requirement to create, modify and troubleshoot
- Can be reused & shared
 - Supports more advanced data transfermations

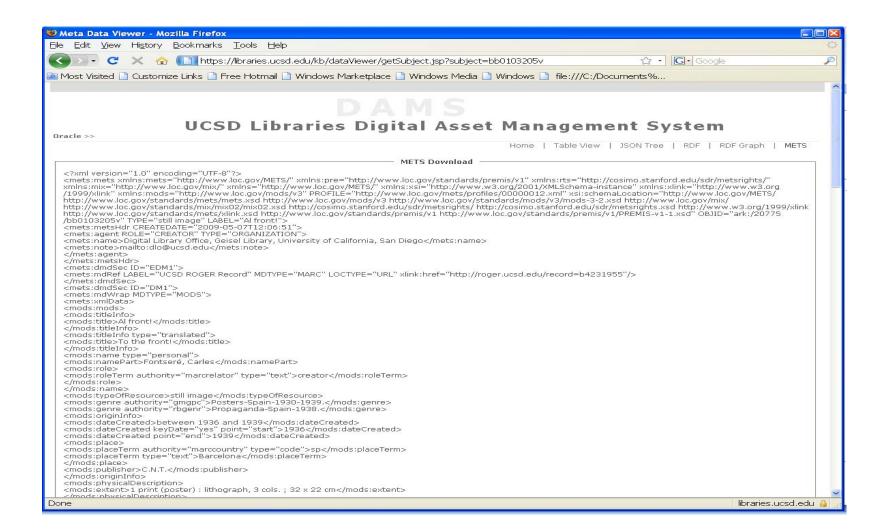
UC San Diego Libraries' DAMS



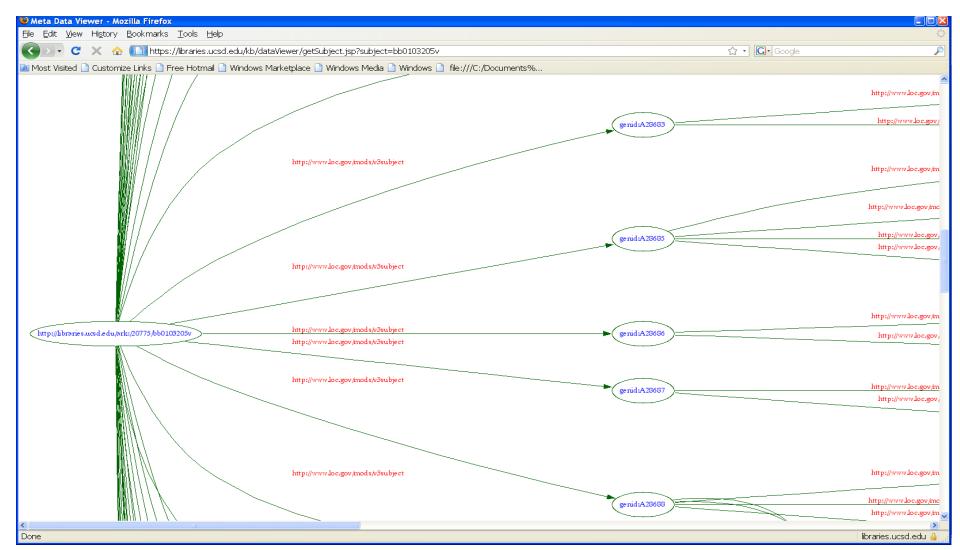
Multiple metadata views via XSLT



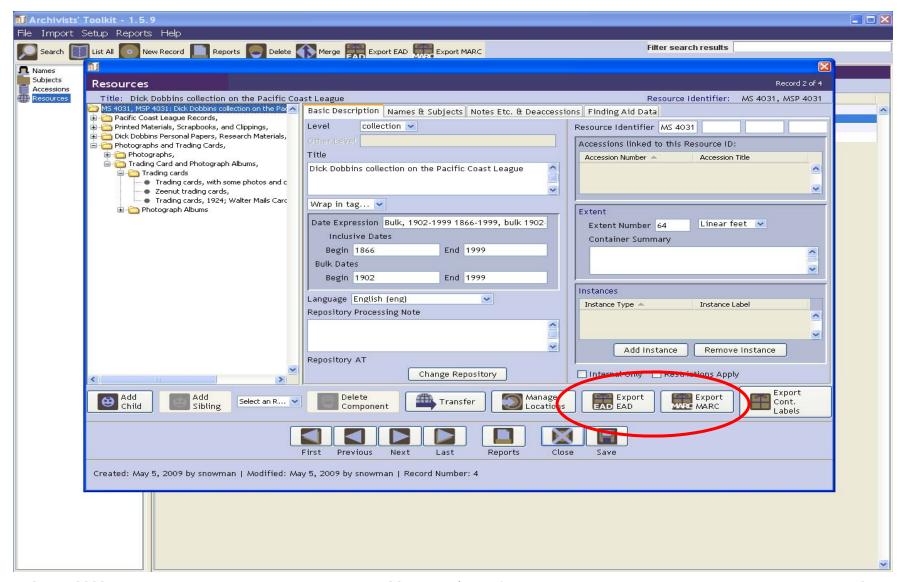
METS view



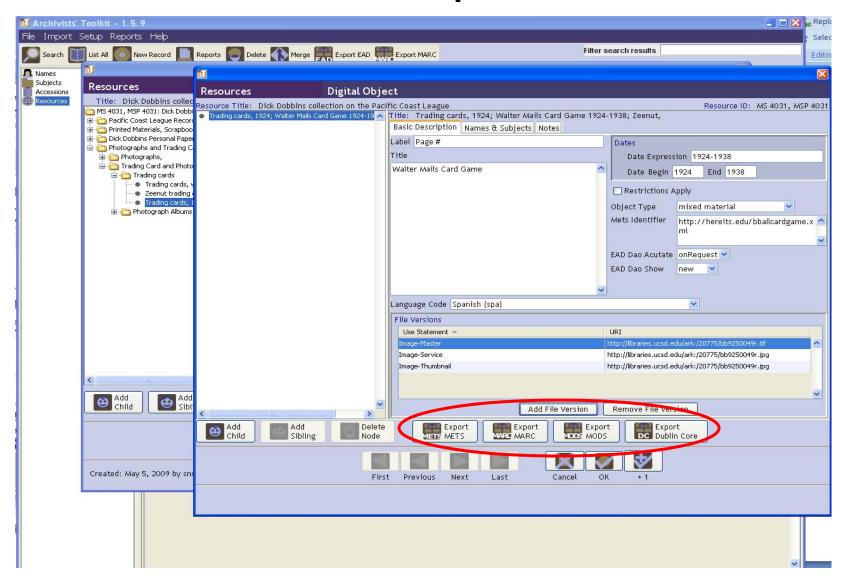
RDF graph view



Archivists' Toolkit

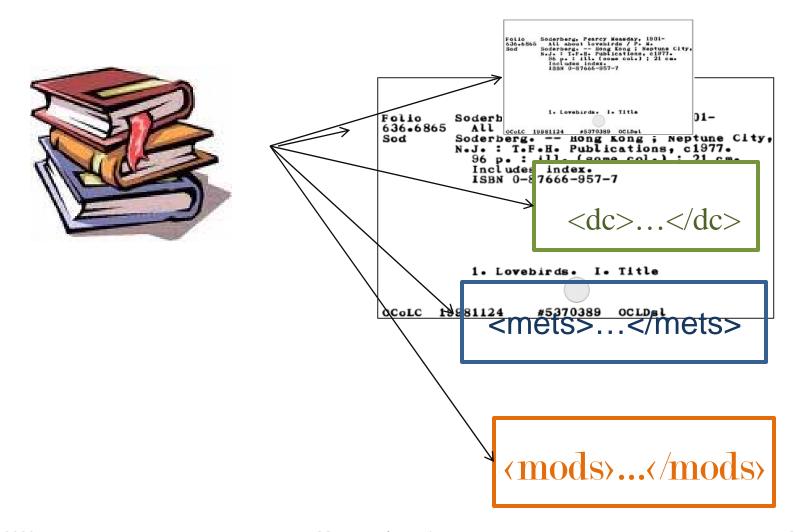


AT DO exports

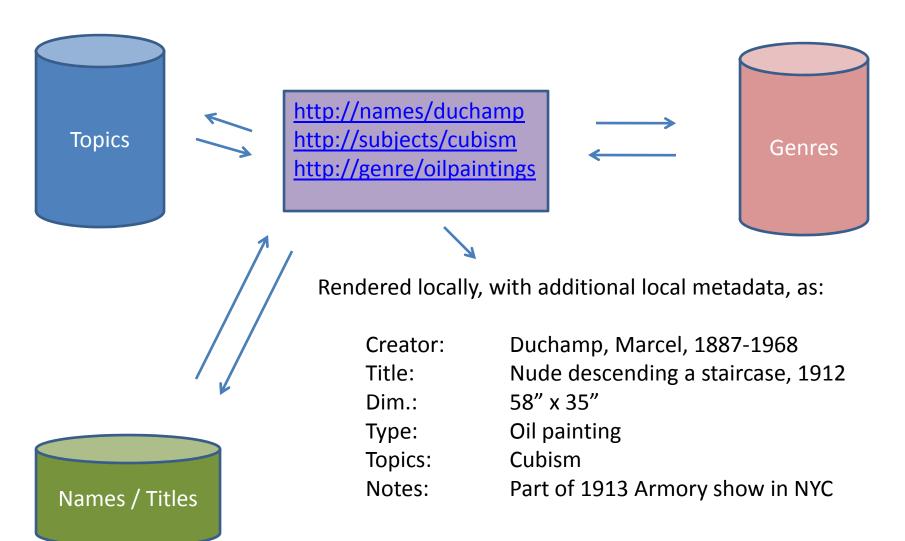




The problem of metadata synchronicity



Linked resources





Metadata in a

Metadata in a



Metadata in a Correct! You've digitized 1 word.

Metadata in a Crowc

Metadata in a Crowc

shared knowledge

Hi, I'm Kevin

Hi, I'm Kevin Rundblad

What is Metadata in a Crowd?

INTRO: Real 2.0 vs. Simulated 2.0

MAIN: Simon Says "Tag This Photo"

Human Computation Models

Thinking in 2.0 – Engaging the User

2.0 is a Culture, Not

2.0 is a Culture, Not Tech

If the 2.0 idea is not about the user ...it is artificial 2.0

Real 2.0 comes directly from users

Traditional development will struggle with 2.0 development, since it is focused on the process, not the user.

Technology only expresses 2.0 ideas

2.0 is about Creators / Participants

Individuals post valuable info

Many consume it

Expert

Seeks Objective Articulation
Structured and Precise
Narrowly Defined Expertise

Social

Very Wide Knowledge

Fragments of Expertise

Tends to be Locally Derived

Subjective Perspective

Emotional Metadata



Social knowledge: Many Perspectives





















Is the Crowd a Viable Source of Metadata?

Aren't Users Lazy?

Um, Yes and Yes

But they do like to play games...

...spending many hours earning points that don't mean anything

...motivation is key for participation

...and participation often means completing an intelligent task

Human Computation

Human Computation

Finding tasks that humans can do better than computers

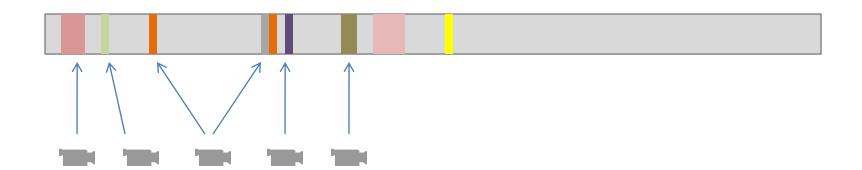
Human Computation

Finding tasks that humans can do better than computers

And creating motivation to perform them

Human Computation and

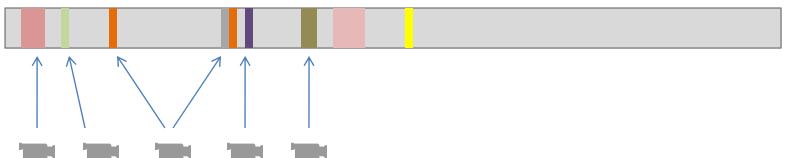




One Video File requested



One Video File requested



Many systems each delivering parts of file, until entire file is complete

Socially formed knowledge is like the P2P distribution architecture

Social Knowledge - Human Computation

Content formed from many individuals



Many individuals contributing parts of the content

But "...unlike computer processors, humans require some incentive to become part of a collective computation".

Louis Von Ahn

Source: invited talk at CMU on Human Computation

Models of Human Computation

AKA Human Intelligence Tasks (HITs) (Coined by Amazon)

Human Intelligence Tasks – 3 Types

- Socially motivated
- Economically motivated
- Tacit (user may be unaware of task itself they perform)

Human Intelligence Tasks (social)

(or social knowledge systems)

Tagging (Flickr) and Comments (Amazon)

Ratings (Yelp)

Problem Solving (StackOverflow)

Tagging @ flickr





The Library of Congress' photostream 🕮

Collections Sets Tags Archives Favorites Profile

1910s 1911 1912 1913 1940 1940s 1941 1942 1943 4x5 aircraft airplane alfredpalmer alfredtpalmer america architecture army athlete aviation baincollection bainnewsservice baseball baseballplayer blackandwhite boat boxer boxing building bw california car catroncounty chicago children city clouds color colorized crowd dc delano detroitpublishingcompany dress factory farm fashion field flag flags forties fsa fsaowi georgegranthambain georgegranthambaincollection glassnegative greatmustachesoftheloc hat hats hills historicalphoto historicalphotographs history horse horses house howardhollem howardrhollem illinois industry iwd jack jackdelano june kentucky labor landscape largeformat If

libraryofcongress man manhattan marion men military mountains navy new newmexico newyork newyorkcity norway ny nyc october october 1942 old palmer palmeralfredt parade people philadelphia photochrom pilot plane politics portrait president puertorico railroad rosietheriveter royalty russelllee ship sky slidefilm snow soldiers sport sports street strike suffrage suit texas train transparencies transparency trees uniform uniforms unitedstatesofamerica

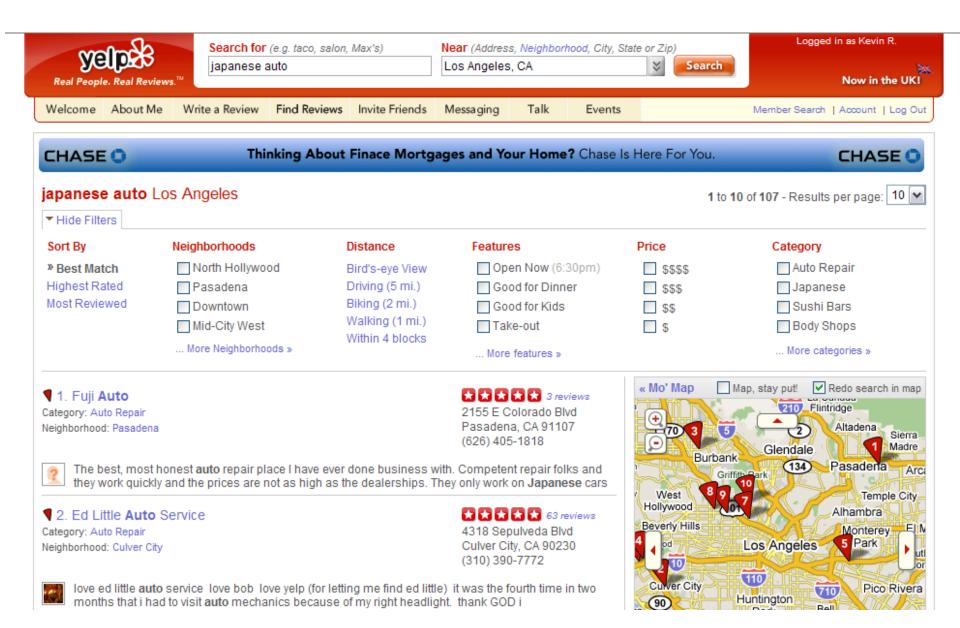
Tagging @ flickr

Wider Discovery

Public Tagging

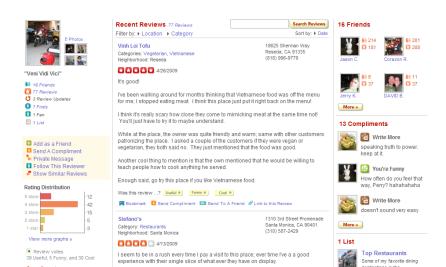


Social is local



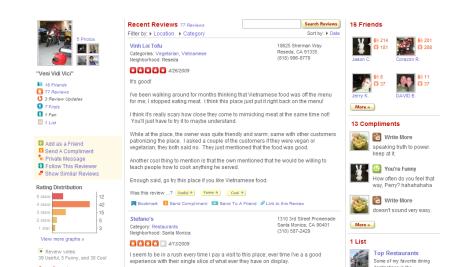
Social is local

Efficient Discovery



Efficient Discovery

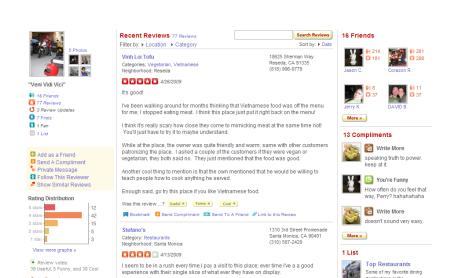
"Hearsay" becomes Reliable



Efficient Discovery

"Hearsay" becomes Reliable

Marketing becoming less credible

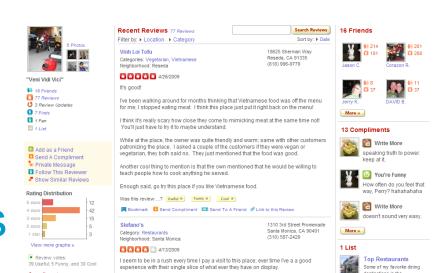


Efficient Discovery

"Hearsay" becomes Reliable

Marketing becoming less credible

Many perspectives creates trustworthiness



Social is local









"Veni Vidi Vici"

👫 16 Friends

77 Reviews

🔰 3 Review Updates

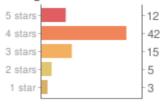
🇱 7 Firsts

🚼 1 Fan

🗏 1 List

- Add as a Friend
- Send A Compliment
- 🛂 Private Message
- 1 Follow This Reviewer
- Show Similar Reviews

Rating Distribution



View more graphs »

Review votes:39 Useful, 5 Funny, and 30 Cool

Recent Reviews 77 Reviews

Filter by: ▶ Location ▶ Category

Vinh Loi Tofu

Categories: Vegetarian, Vietnamese

Neighborhood: Reseda

*** * * * * * *** 4/26/2009

It's good!

I've been walking around for months thinking that Vietnamese food was off the menu for me; I stopped eating meat. I think this place just put it right back on the menu!

I think it's really scary how close they come to mimicking meat at the same time not! You'll just have to try it to maybe understand.

While at the place, the owner was quite friendly and warm; same with other customers patronizing the place. I asked a couple of the customers if they were vegan or vegetarian, they both said no. They just mentioned that the food was good.

Another cool thing to mention is that the own mentioned that he would be willing to teach people how to cook anything he served.

Enough said, go try this place if you like Vietnamese food.

Was this review ...? Useful 9 Funny 9 Cool

📕 Bookmark 🔞 Send Compliment 🖾 Send To A Friend 🔗 Link to this Review

Stefano's

Category: Restaurants Neighborhood: Santa Monica 1310 3rd Street Promenade Santa Monica, CA 90401 (310) 587-2429

🚼 🚼 🚼 🛣 🖳 4/13/2009

I seem to be in a rush every time I pay a visit to this place; ever time I've a a good experience with their single slice of what ever they have on display.

16 Friends

Search Reviews

18625 Sherman Way

Reseda, CA 91335

(818) 996-9779

Sort by: ▶ Date



214



28

Jason (

Corazon



₩ 8 23 37



DAVID

More »

13 Compliments





Write More

speaking truth to power. keep at it.





How often do you feel that way. Perry? hahahahaha





doesn't sound very easy.



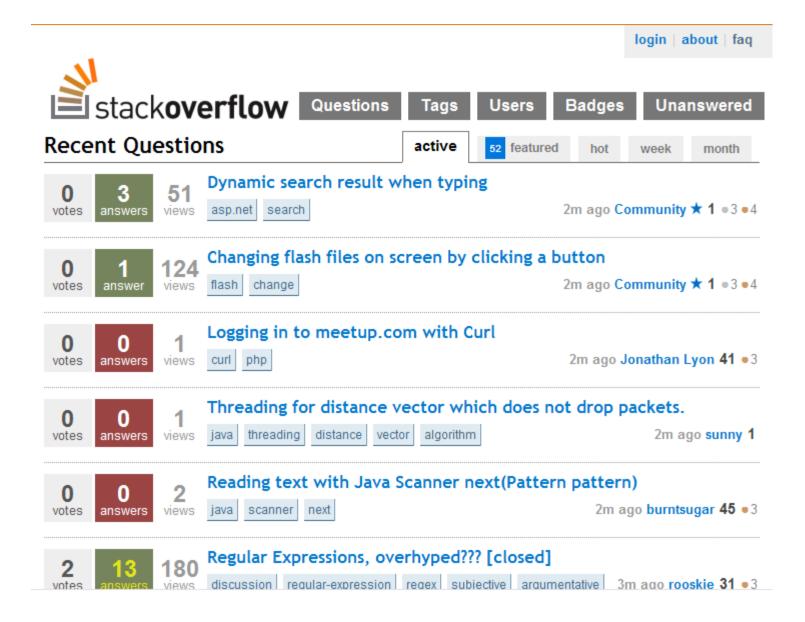
1 List



Top Restaurants

Some of my favorite dining

Problem Solving @ stackoverflow



Problem Solving @ stackoverflow

login | about | fag



Badges

Unanswered

Regular Expressions, overhyped??? [closed]



I'm a member on several forums that have a subforum dedicated to programming questions.



It is an observation that to almost every single question about finding data in strings, the most common answer is "use regular expressions". And if you're lucky, a link to a tutorial.



For many situations that people will generally recommend regular expression, it's pure overkill.

Many things can be done with substring() and split() functions, yet people always seem to put regular expressions on a throne. Why is this?

Does this have something to do with the history of regular expressions versus these OO-language functions? Are the people who recommend regular expressions old farts?

Why in the name of the Matrix should I use a regular expression and test it, to see if a string contains a questionmark, if I can just do string1.contains("?");

While in some cases, such as form validation, regular expressions are usefull, I find that in most cases I don't need them.

So how often do you use regular expressions, not because it's usefull, but because it's what you're used to using.

EDIT: if you're gonna vote to close this, at least have the decency to make a comment as to why!

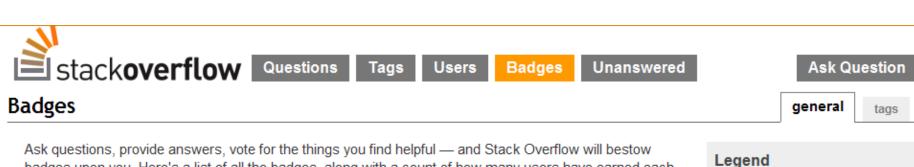
discussion

regular-expression

regex subjective

argumentative

Problem Solving @ stackoverflow



Ask questions, provide answers, vote for the things you find helpful — and Stack Overflow will bestow badges upon you. Here's a list of all the badges, along with a count of how many users have earned each one so far:



Gold Badge

Gold Badges are rare. You'll have to not only participate but be skilled and knowledgeable to earn these. They're something of an accomplishment!

Silver Badge

Silver badges are earned for longer term goals. Silver badges are uncommon, but definitely attainable if you're interested enough.

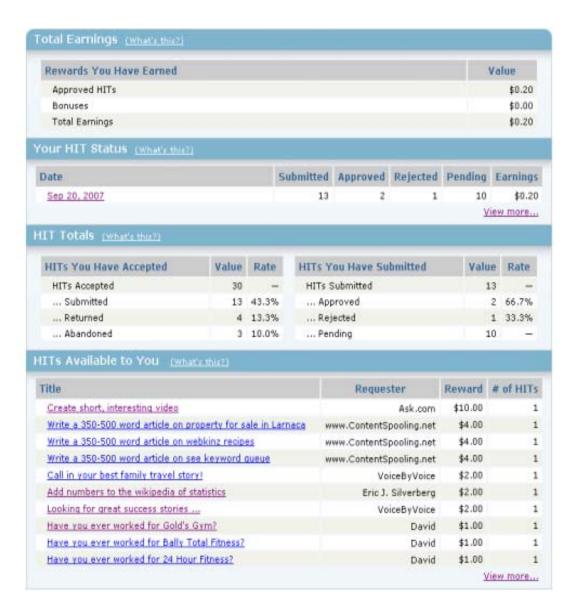
Bronze Badge

Bronze badges are earned for basic use of the Stack Overflow site; they are relatively easy to earn.

Human Intelligence Tasks (economic)

Mechanical Turk (Amazon) - small tasks \$0 - \$10 TextEagle (Nathan Eagle) - tasks for mobile phone

Small Tasks @ Mechanical Turk



Small Tasks @ Mechanical Turk

Small Tasks

Time vs. Economics (does not add up)



Small Tasks @ TextEagle

Mobile Human Computation in Africa

TextEagle is a..."system enabling the 3 billion mobile phone subscribers living in the developing world to earn small amounts of money by completing short, SMS-based tasks."

Nathan Eagle Research Scientist, MIT

Small Tasks @ TextEagle

Translation/Transcription Services

Question: Translate the phrase "Address Book" into Giriama.

Question: Transcribe the following audio clip from a New York hospital.

Also Citizen Journalism

Human Intelligence Tasks (tacit)

User may not be aware of how tasks are utilized.

reCAPTCHA (based on CAPTCHA)
ESP Game (now Google Image Labeler)



CAPTCHA:

"Are you human?"

(CAPTCHA: Developed by Louis Von Ahn)



CAPTCHA:

(Completely Automated Public Turing Test To Tell Computers and Humans Apart)

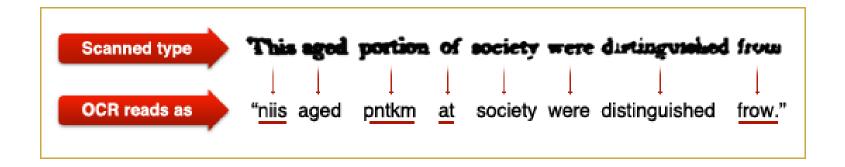
Security based on human perception Turing Test administered by AI

(CAPTCHA: Developed by Louis Von Ahn)



Security + Failed OCR = Opportunity

(CAPTCHA: Developed by Louis Von Ahn)



Currently being used to help scan books for **Internet Archive** and old editions of the **New York Times**.

(graphic - http://recaptcha.net/learnmore.html)

Bots getting better at deciphering the CAPTCHAs

Bots getting better at deciphering the CAPTCHAs

Creates feedback loop - Good thing, since it means OCR gets more precise at same time

ESP Game (now Google Image Labeler)

2 individuals match = high probability of reliable result



With Human Computation...

...computing becomes the coordinating force between many individuals and intelligent or perceptual tasks.

Human Computation Models

Social

Tagging (Flickr) and Comments (Amazon)
Ratings (Yelp)
Problem Solving (StackOverflow)

Economic

Mechanical Turk (Amazon) - small tasks \$0 - \$10 TextEagle (Nathan Eagle) - tasks for mobile phone

Tacit

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How can you create a platform for capturing social knowledge?

Shared Knowledge Production

Public platforms – ex. Flickr

Develop platform – ex. Simul8 Model

UCLA Library Simul8 Group Model

Listen to users – experience paradigm

See user mode, lifestyle, aesthetic

Engage in their mode – playful and experimental dev

Fast prototyping with high level programming

Student developers and designers

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One Question:

One Question: Are You Human?

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