

End User Semantic Web Applications

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Conclusion

- A key innovation opportunity in the Semantic Web is making it easier for end users to produce, share, and consume structured data
- An urgent need and immediate opportunity for tools that take the drudgery out of data work
- We have to study end users to understand their needs, build tools to meet those needs, and assess how those tools work for them
- Don't ask what you can do for the Semantic Web; ask what the Semantic Web can do for you!

Back Story

- New prof. in 1995 aiming to do research in IR
- Got a big grant to buy powerful IR machines
- Then decided computation wasn't the problem
- People can't find information because their applications won't let them store/organize/view it the way they want
 - Hard-coded schemas
 - Fixed visualizations
 - Information fragmentation

Problem-Driven Agenda

- Create a UI that would let end user
 - Collect arbitrary information
 - Define their own schema
 - Design their own visualizations in that schema
- Under the hood, used techniques from
 - HCI
 - Machine Learning
 - Programming languages
 - Databases
- But all driven by need to solve a specific problem

Haystack

- Semantic Web app before the Semantic Web
 - Research paid for by the machines I didn't buy
- Entity-relation data model
- “Lenses” to display individual items
 - Specification of which properties, and their layout
- “Views” of collections
 - E.g. lists, thumbnails, tabular
- “Facets” to filter items
- When RDF invented, became Haystack model
 - And haystack became an early “semantic desktop”

Collection (20 items):

Similar Items

Sharing a property:
Creator Karger (36), RDF Type Message (40)

Refine Collection

Body Content:
Groups (2), Thanks (2), ...

Body Creator:
Karger (2)

Body RDF Type:
HTTP Content (2), Note (2)

Date:
Est (2), Nov (2)

Sent:
Est (2), Nov (2)

E-mail

- Compose Talk Announcement
- Compose e-mail message
- Existing Messaging and news connections
- Import inbox from Outlook
- Inbox
- Synchronize mail
- Mail categories

History

Create a project workspace

Inbox

Change view Change layout

From	Title	Date	Recommended categories
Hari Balakrishnan [hari@csail.mit.edu]	RE: bitmap figures in latex?	10:08 PM	<input type="checkbox"/> High importance <input checked="" type="checkbox"/> Inbox <input type="checkbox"/> To-do list Add
No items in list	Jaime Teevan	No ite...	<input type="checkbox"/> High importance <input checked="" type="checkbox"/> Inbox <input type="checkbox"/> To-do list Add
Karun Bakshi [kbakshi@mit.edu]	Google Scholars	8:31 PM	<input type="checkbox"/> High importance <input checked="" type="checkbox"/> Inbox <input type="checkbox"/> To-do list
Jaime Teevan [teevan@csail.mit.edu]	SWIRL: Talks on Infor...		
RSS feed "Slashdot: "	The Worst Jobs in Scie...		
Robert Kr [robi@alm...	Person: Robert Krauthgamer		
RSS feed	Mail Endpoint Specification: Robert Krauthgamer [robi@almaden.ibm.com]		
	List		
	Asynchronous message: Re: visit to MIT		
	List		
	Collection: Inbox		

Person: Robert Krauthgamer

- Add to Address Book
- Annotate
- Apply tools to
- Browse to
- Chat
- Compose e-mail message
- Copy URI
- Locate additional information
- Recommend
- Remind me to contact this party
- Remind me to prepare for this
- Remind me to read this
- Rename
- Send this item to someone
- Use in pending tasks...
- Show summary...

Hari Balakrishnan

Hari Balakrishnan

- Messages to this person
- Messages from this person
- RE: bitmap figures in latex?

Google Scholars

Google Scholars

- Body
 - I think someone sent out a blurb about this...in any case, if you have not already, try out scholar.google.com...it's pretty cool!
 - Karun
- Attachments
- Recommended categories
 - High importance (0 items)
 - Inbox (26 items)
 - To-do list (0 items)

Writing a Brain Research Paper

Neuroscience Conference '05

Change view ▾

- All information
- Metadata editor
- Show Information Workspace Editor view
- Show Information Workspace Usage view
- Web browser

Caudate, 11.1 cc, t
Caudate, 10.7 cc, t
Caudate, 10.3 cc, t
Caudate, 10.1 cc, t
Caudate, 10.3 cc, t
Caudate, 10.1 cc, t

Interesting Publications

Basal ganglia volumes in first-episode schizophrenia and healthy comparison subjects.
Ashtari, Manzar, Lieberman, Jeffrey, Robinson, Delbert G, Bilder, Robert, Wu, Huwei, Gunduz, Handan, Kane, John, Alvir, Jose, Crandall, David and Bogerts, Bernhard

Brain anatomy, gender and IQ in children and adolescents with

Collaborators

- Leroux, G
- Thiel, Thorsten
- Thirion, J P
- Woermann, F G
- Zilles, K

Send File...
Chat
Send Paper...
Send Data...
Email...

Interesting Groups

- g10, Human, Normal
- g106, Human, Schizophrenia
- g107, Human, Normal
- g11, Human, Normal
- g115, Human, Normal
- g14, Human, ADHD
- g15, Human, Normal
- g16, Human, Normal
- g17, Human, ADHD
- g22, Human, Normal
- g238, Human, Autism
- g239, Human, Normal
- g32, Human, Normal
- g33, Human, ADHD
- g34, Human, ADHD
- g35, Human, Normal
- g40, Human, Normal
- g41, Human, Normal
- g43, Human, Normal
- g44, Human, Normal
- g45, Human, Alzheimer's Disease
- g46, Human, Alzheimer's Disease: Converters
- g47, Human, Alzheimer's Disease: Questionable
- g592, Human, Fragile X
- g593, Human, Fragile X
- g594, Human, Normal
- g595, Human, Normal
- g704, Human, Very Low Birth Weight
- g705, Human, Normal

Related Authors

Abernethy, L J

Quantitative magnetic resonance imaging of the brain in survivors of very low birth weight.
Palaniappan, M, Abernethy, L J and Cooke, R W I

Adrien KT

Dissociations of cerebral cortex, subcortical and cerebral white matter volumes in autistic boys.
Lange N, Hodgson J, Harris GJ, Herbert MR, Caviness VS, O'Brien LM, Makris N, Steele S, Bakardjiev A, Kennedy D, Adrien KT, Ziegler DA and Deutsch CK

Albert, Marilyn

Whole brain segmentation: automated labeling of neuroanatomical structures in the human brain.
Haselgrove, Christian, Busa, Evelina, Dale, Anders M, Klaveness, Shuna, Albert, Marilyn, Killiany, Ron, Dieterich, Megan, Kennedy, David, Montillo, Albert, van der Kouwe, Andre, Fischl, Bruce, Rosen, Bruce, Makris, Nikos and Salat, David H

Alvir, Jose

Basal ganglia volumes in first-episode schizophrenia and healthy comparison subjects.
Ashtari, Manzar, Lieberman, Jeffrey, Robinson, Delbert G, Bilder, Robert, Wu, Huwei, Gunduz, Handan, Alvir, Jose, Kane, John, Crandall, David and Bogerts, Bernhard

Adding “Things to Do” Region

The screenshot displays a web application interface for "Neuroscience Conference '05". At the top, there is a navigation bar with "Back", "Go to", and "Search for" fields, along with "Starting Points". Below this is a header section with the title "Neuroscience Conference '05" and a "Change view" dropdown. The main content area is organized into a grid of six regions, each with a "Title" field and a "Description" field. The regions are:

- Top Left:** Title: "Interesting Volumes". Content: "Content", "Presentation", "Manipulation".
- Top Middle:** Title: "Interesting Publications". Content: "Content", "Presentation", "Manipulation". Available Operations: "Open Document", "View Abstract".
- Top Right:** Title: "Collaborators". Content: "Content", "Presentation", "Manipulation".
- Middle Right:** Title: "Collaborators Preview". Content: "Content". Underlying Information Entity: "Collaborators".
- Bottom Left:** Title: "Interesting Groups". Content: "Presentation". Show Title: . Portal Spacing (pixels): . Portal Border Width (pixels): . View Part Class to Use: "PhraseViewPart".
- Bottom Middle:** Title: "Related Authors". Content: "Content", "Presentation", "Manipulation".
- Bottom Right:** Title: "Remaining To Dos". Content: "Content". Underlying Information Entity: "BIRN Todo Items (Enabled)".

Each region has a vertical toolbar on its right side with icons for expand, collapse, and close. The interface uses a dark theme with blue accents.

Revised Environment

Navigation: Back, Home, Go to, Search for, Starting Points

Neuroscience Conference '05

Change view

Interesting Volumes

Amygdala, 1.57 cc, l
 Amygdala, 6.6 cc, t
 Amygdala, 2.23 cc, l
 Amygdala, 1.99 cc, r
 Amygdala, 2.34 cc, l
 Amygdala, 2.33 cc, r
 Amygdala, 1.83 cc, r
 Amygdala, 2.06 cc, r
 Amygdala, 2.29 cc, r
 Amygdala, 2.56 cc, r
 Amygdala, 1.75 cc, r
 Amygdala, 1.66 cc, l
 Amygdala, 1.75 cc, l
 Amygdala, 1.74 cc, r
 Amygdala, 3.8 cc, t
 Amygdala, 1.99 cc, l
 Amygdala, 1.84 cc, r
 Amygdala, 4.3 cc, t
 Amygdala, 5.8 cc, t
 Amygdala, 6.3 cc, t
 Amygdala, 1.55 cc, r
 Amygdala, 1.58 cc, l
 Amygdala, 1.59 cc, r

Interesting Publications

A.E. Bennett Research Award. Developmental traumatology. Part II: Brain development.
 Frustaci, K, Boring, A M, De Bellis, M D, Giedd, J N, Casey, B J, Ryan, N D, Clark, D B and Keshavan, M S

Amygdala and hippocampal volumes in children with Down syndrome: a high-resolution MRI study.
 Eliez, S, Schmitt, J E, Capone, G T, Brown, W E, Reiss, A L and Pinter, J D

Amygdala pathology in psychosis of epilepsy: A magnetic resonance imaging study in

Collaborators

Leroux, G
 Thiel, Thorsten
 Thirion, J P
 Woermann, F G
 Zilles, K

Buttons: Send File..., Send Data..., Chat, Email..., Send Paper...

Collaborators Preview

Thirion, J P

Automatic detection of hippocampal atrophy on magnetic resonance images.

Webb, J, Chadwick, D, Thirion, J P, Roberts, N, Meunier, J, Guimond, A and Eldridge, P

Interesting Groups

g10
 Species: Human, Diagnosis: Normal

Subjects: 20
 Left Handed Subjects: 5 Right Handed Subjects:
 Male Subjects: 10 Female Subjects: 10
 Mean Age: 27.2, +/- 5

Reporting Publication: The young adult human brain: an MRI-based morphometric analysis
 Method Publication: Anatomic Segmentation and Volumetric Calculations in Nuclear Magnetic Resonance Imaging

Volumes:
 Thalamus, 10.3 cc, l
 Cerebral Cortex, 688.8 cc, t
 Lateral Ventricle, 8.1 cc, r
 Ventricular System, 21.3 cc, t
 Cerebellum, 71.9 cc, l
 Brain, 1380.1 cc, t

Related Authors

Achten, E

Intra- and interobserver variability of MRI-based volume measurements of the hippocampus and amygdala using the manual ray-tracing method.
 Boon, P, De Wagter, C, De Reuck, J, Van Damme, F, Achten, E, Deblaere, K and Kunnen, M

An MR protocol for presurgical evaluation of patients with complex partial seizures of temporal lobe origin.
 Boon, P, Calliauw, L, De Poorter, J, Van de Kerckhove, T, De Reuck, J, Achten, E and Kunnen, M

Albaugh, Matthew D

Remaining To Dos

Assigned To: Karun Bakshi
 Status: Complete Pending
 Priority: High Medium Low
 Due Date: 5/6/05
 Title: Check Data Quality
 Topic: BIRN Paper
 Description:

Sub Tasks
 Verify Data Provenance (Pending, Low)

Assigned To: Karun Bakshi

Volumes (Enabled)

Enable

DC Title	Description
Volumes	A channel for volum

Query

BIRN Volumes for Structure C

The following parameters are required:

Structure: Amygdala

What is expected?

Minimum Value: 1.5

What is expected?

Channel Viewer Tool

Channel: Personal E-mails

Funny Joke
 Joey's Doctor's Appt.
 On your way home

Description: This is an e-mail reminder of Joey's doctor's appointment at 1:30 today.

Role of Semantic Web

- Was Haystack a Semantic Web Application?
 - How could it be, if created before Semantic Web?
- Wasn't "working on the semantic web"
 - Rather, was working on a problem users have
 - Seeking solutions from any discipline
- What, exactly, can the Semantic Web contribute?
- What makes a "Semantic Web application"?
- What use is the Semantic Web, anyway?

Semantic Web Applications

- What is novel about semantic web applications?
 - Use of triple stores, RDF, inference?
 - Any such app can be emulated with “old” technology
- Motta
 - An application that leverages the semantics of its data
- Karger
 - An application whose schema is expected to change
 - Into whatever its user desires
 - Paradox: cannot leverage semantics of data!
 - Creates major challenges for user interface design

Role of Semantic Web

- The Semantic Web holds a big part of the answer to a major problem in end-user information management
- Key contribution is “mutable schema” paradigm
- So yes, Haystack was a Semantic Web Application

Rest of Talk

- Continue end-user problem-centric perspective
 - And thesis that Semantic Web can solve it
- Convince you end-user data problem is serious
 - Channel a CHI talk by Vaida, Harman, Al-Ani
- 3 Semantic Web applications that chip away at it
 - All designed around “open schema” principle
 - Supercharge spreadsheets for data interaction
 - A standard for data & visualization in HTML
 - An end-user programmable data-handling agent
- Wrap-up thoughts about SW and ESWC

Homebrew Databases

- A paper by Voids, Harman, Al Ani
- Published at CHI 2010
- Highlights how bad this problem is
- An embedded user study
 - No tools built
 - Went where users were
 - Watched what they did
 - Tried to understand why
 - SW community needs this badly!

**“I WANT MY SPREADSHEET
DATABASE TO WORK BETTER”**

Eirik Bakke, David Karger, Rob Miller

A spreadsheet-based user interface for managing plural relationships in structured data [CHI 2011]

SUPERCHARGING SPREADSHEETS FOR DATA MANAGEMENT

Spreadsheets

- As we've seen, a dominant tool for data
- But limited
 - Flat table
 - Hard to represent entity-relationship graphs
 - No types
 - No support for many-many relationships
 - No joins
- Can we add power but preserve look and feel?
 - Yes, with nested cells and data wormholes

Spreadsheets

Microsoft Excel - Excel Example.xls

File Edit View Insert Format Tools Data Window Help Adobe PDF

Type a question for help

100%

Arial 10

J8 Calculate prices and create invoices and quotes for clients

	A	B	C	D	E	F	G	H	I	J	K	L	
1	WorkerId	QualVal	QualVer	Work	Occupation	Uses	Ho	Suggestio	Ge	Kind of tasks	Age	AcceptTime	SubmitTin
2	A3PVID6SW962J0	94	assv1	487	Student in E	No	4		M	Inventory	18	Fri Aug 13 22:24:16 GMT 2010	Fri Aug 13
3	A339SG6F8ZDJZP	22	assv1	443	homemaker	no	3		F	statistic report	31	Fri Aug 13 17:09:21 GMT 2010	Fri Aug 13
4	A3S0F1GABMBS9P	62	assv1	416	BPO	NO	6		M	FOR OFFICE REPO	25	Fri Aug 13 16:54:40 GMT 2010	Fri Aug 13
5	A2EN81T1B3UG8O	33	assv1	158	Financial Pa	No	6		F	Financial planning us	26	Fri Aug 13 18:00:05 GMT 2010	Fri Aug 13
6	A23NZKRLK9Y9VM	40	assv1	705	Computer F	large	6	this looks g	M	analysis, charts	34	Fri Aug 13 16:47:27 GMT 2010	Fri Aug 13
7	A3KJWPLY0TSQU	40	assv1	481	HR	Yes.	5		F	Mark sheets, Analys	27	Fri Aug 13 16:50:45 GMT 2010	Fri Aug 13
8	A1LZDJ495KCENK	26	assv1	1197	Business O	Yes.	4		M	Calculate prices and	35	Fri Aug 13 18:47:31 GMT 2010	Fri Aug 13
9	A2GJRH7X3VWVHJ1	91	assv1	261	Software En	SQL	3		M	Report	27	Thu Aug 19 11:22:05 GMT 2010	Thu Aug 19
10	A25JHOMQM0CST3	40	assv1	780	House Wife	No	4		F	House Expenditure	27	Sat Aug 14 02:39:34 GMT 2010	Sat Aug 14
11	A3QRUPH0Z8UJTO	54	assv1	1884	Teacher	No	4	There shou	M	Table Making	25	Sun Aug 15 09:38:34 GMT 2010	Sun Aug 15
12	A85ADFWPT74W1	61	assv1	1043	IT Executive	Micr	7		M	Data crunching, piv	25	Thu Aug 19 15:49:02 GMT 2010	Thu Aug 19
13	AMRLMNPUCIUXL1	51	assv1	2004	Working in f	no	6	Suppose if	M	for storing the data t	33	Sat Aug 14 04:42:01 GMT 2010	Sat Aug 14
14	A2ZQV3OWON730B	67	assv1	334	Executive A	Yes.	7		F	For maintaing MIS	42	Sat Aug 14 09:32:28 GMT 2010	Sat Aug 14
15	AMVD0WU87EIK5	58	assv1	2440	TEACHER	YES	5	NO	M	FOR TEACHING	52	Sat Aug 14 06:15:10 GMT 2010	Sat Aug 14
16	A31Z06KS8M1B88	37	assv1	522	painter	no	4	The tool is	F	accounting	25	Thu Aug 19 20:50:49 GMT 2010	Thu Aug 19
17	A237FGJCPV99GJ	47	assv1	1012	Analyst Pro	Yes.	7	Yes..have g	M	Report Automation, v	35	Sat Aug 14 02:45:09 GMT 2010	Sat Aug 14
18	A2QNMLTMQHCNJK	59	assv1	345	Business A	Yes.	6		M	various, usually work	24	Sat Aug 14 05:37:50 GMT 2010	Sat Aug 14
19	A3504EYD2O4CPN	90	assv1	998	Analyst for	live u	7	I changed t	F	Data analysis and pr	28	Sat Aug 14 03:51:22 GMT 2010	Sat Aug 14
20	A37RKE17Y8X2NU	38	assv1	87	Student	Micr	3	Make it ligh	M	Mathematical calcul	27	Sat Aug 14 13:55:40 GMT 2010	Sat Aug 14
21	A38KHDV1CIY9Q8	97	assv1	194	computer	yes.	7	tool works	F	pivot table	30	Sat Aug 14 03:28:36 GMT 2010	Sat Aug 14
22	A1ES0KWZ144MQH	34	assv1	907	System Ana	Yes.	4		M	To import data in to	32	Sat Aug 14 14:48:09 GMT 2010	Sat Aug 14
23	A1N2UAV9HGNX7W	22	assv1	418	student in n	no	6		M	keeping track of app	20	Thu Aug 19 20:58:54 GMT 2010	Thu Aug 19
24	A26BUICLOZUGFN	24	assv1	424	IT(Hardware	Last	5	No	M	MIS	35	Sat Aug 14 02:07:49 GMT 2010	Sat Aug 14
25	A1UYVA101G2UJP	19	assv1	78	home make	no	4		F	Statements	39	Sat Aug 14 16:03:20 GMT 2010	Sat Aug 14
26	A3G4AUP6VUEW2O	96	assv1	450	BPO	No	6		M	calculations	29	Thu Aug 19 11:09:16 GMT 2010	Thu Aug 19
27	A3RC9YN9HFUOUK	47	assv1	1471	Architect	No	5		M	Project plan tracking	48	Sat Aug 14 02:30:44 GMT 2010	Sat Aug 14
28	A1ADWPP19BHSTQ	29	assv1	588	Network Ad	Yes.	4		M	To analyze and grap	33	Sat Aug 14 19:13:47 GMT 2010	Sat Aug 14
29	A2ZR1B5KGVB48E	27	assv1	70	Electronics	Micr	5		M	bill of materials	28	Thu Aug 19 10:25:05 GMT 2010	Thu Aug 19
30	AWIOBO16GSGV	60	assv1	267	teacher	yes f	6	i like this ty	F	accounting	38	Sat Aug 14 17:55:55 GMT 2010	Sat Aug 14
31	A162TOBLD1669W	87	assv1	382	Student in a	Yes.	6	no commer	M	Calculations, inputtr	26	Sun Aug 22 21:13:40 GMT 2010	Sun Aug 22
32	A2E1C11XI HMVTH	1	assv2	302	STUDENT	NO	5		M	VI LOOKJP HI LOOKI	22	Mon Aug 23 15:27:22 GMT 2010	Mon Aug 23

Sheet1 / Sheet2 / Sheet3

Ready NUM

Alternative: Related Worksheets

Related Worksheets

File Edit

Each row in this column contains: Contents of the selected cell:

Individual Multiple Text Cells ART 587

Courses
 Readings
 Sections
 Meetings
 Instructors
 Grading Categories
 Grading Components

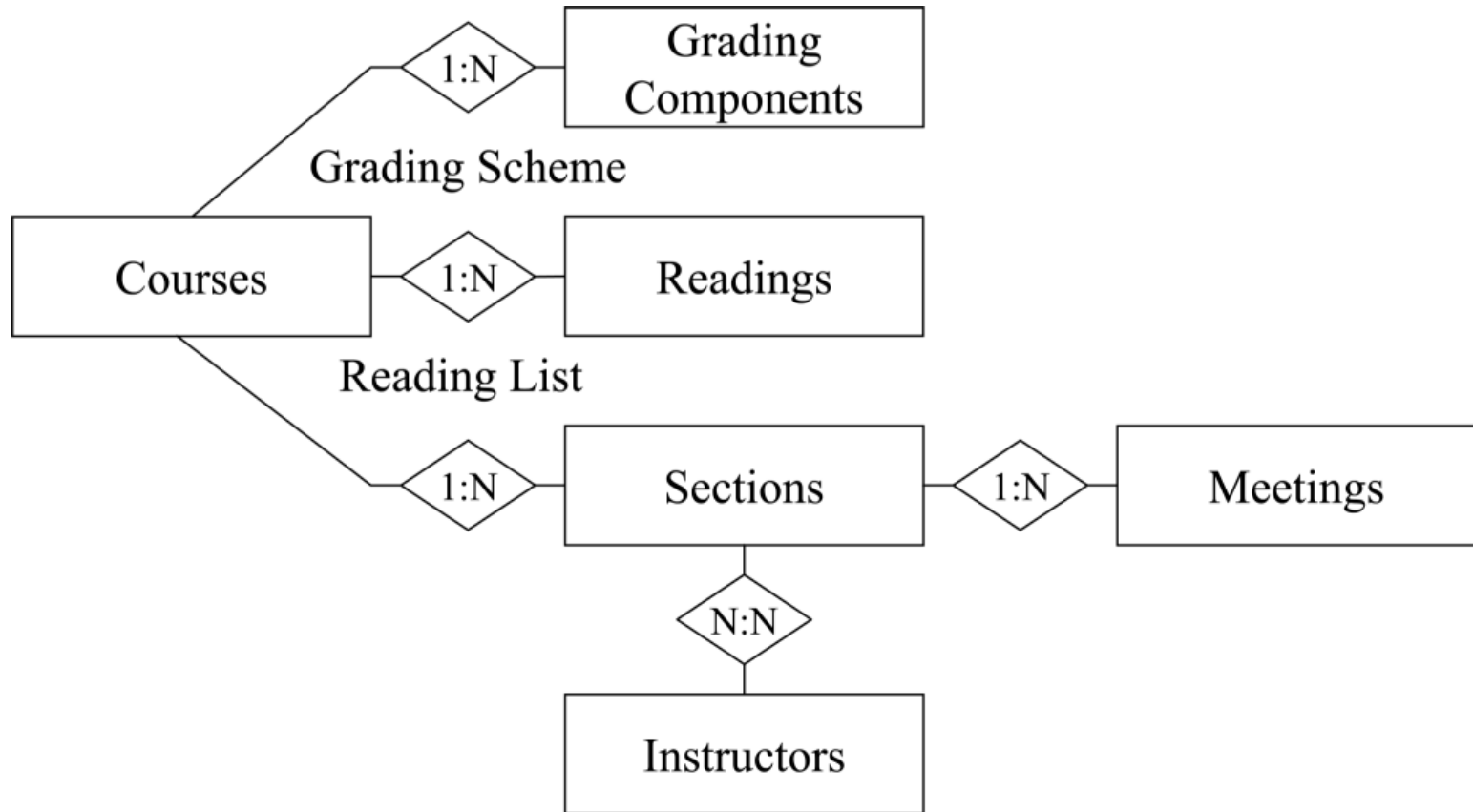
Course Codes	Dist. Area	Title	Reading List	Sections
CLG 214	EC	Seminar: Wisdom, Sophistry, Philosophy: Exploits of Reason before Plato	Kirk, Raven, Schofield Plato Rival Lovers, Theag Kerferd The Sophistic Mov Lloyd Magic, Reason and	C01 T 13:30 FIRES B06M Adam Th 13:30 FIRES B06M
GER 520 ART 587		Topics in Literary and Cultural Theory	Robert Vischer On the Optical Ser Niklas The Reality of the I Luhmann Walter Benn The Shape of the S Michaels Mary Ann The Emergence of Doane Richard Powers Galatea 2.2 Melanie Klein Notes on Some Sc	S01 M 13:30 MCCKH 363 Nellie
KOR 107		Intermediate Korean II	Klear Integrated Korean I Klear Integrated Korean I	C01 M 11:00 FRIST 207 Velma T 11:00 FRIST 207 Th 11:00 FRIST 207 C02 M 12:30 FRIST 205 Velma

Search: Search

Show/Hide Columns:

- Courses
 - Course Codes
 - Dist. Area
 - Title
 - Max. Enrollmer
 - May Audit?
 - Reading List
 - Course
 - Author Nar
 - Title
 - Sections
 - Class Numt
 - Course
 - Status
 - Max. Enrol
 - Section
 - Section
 - Day
 - Time
 - Place
 - Meetings
 - Section
 - Instructors
 - First N

One-to-Many/Many-to-Many Relationships



Related Worksheets

File Edit

Each row in this column contains: Contents of the selected cell:

Individual Multiple Text Cells ART 587

Courses
 Readings
 Sections
 Meetings
 Instructors
 Grading Categories
 Grading Components

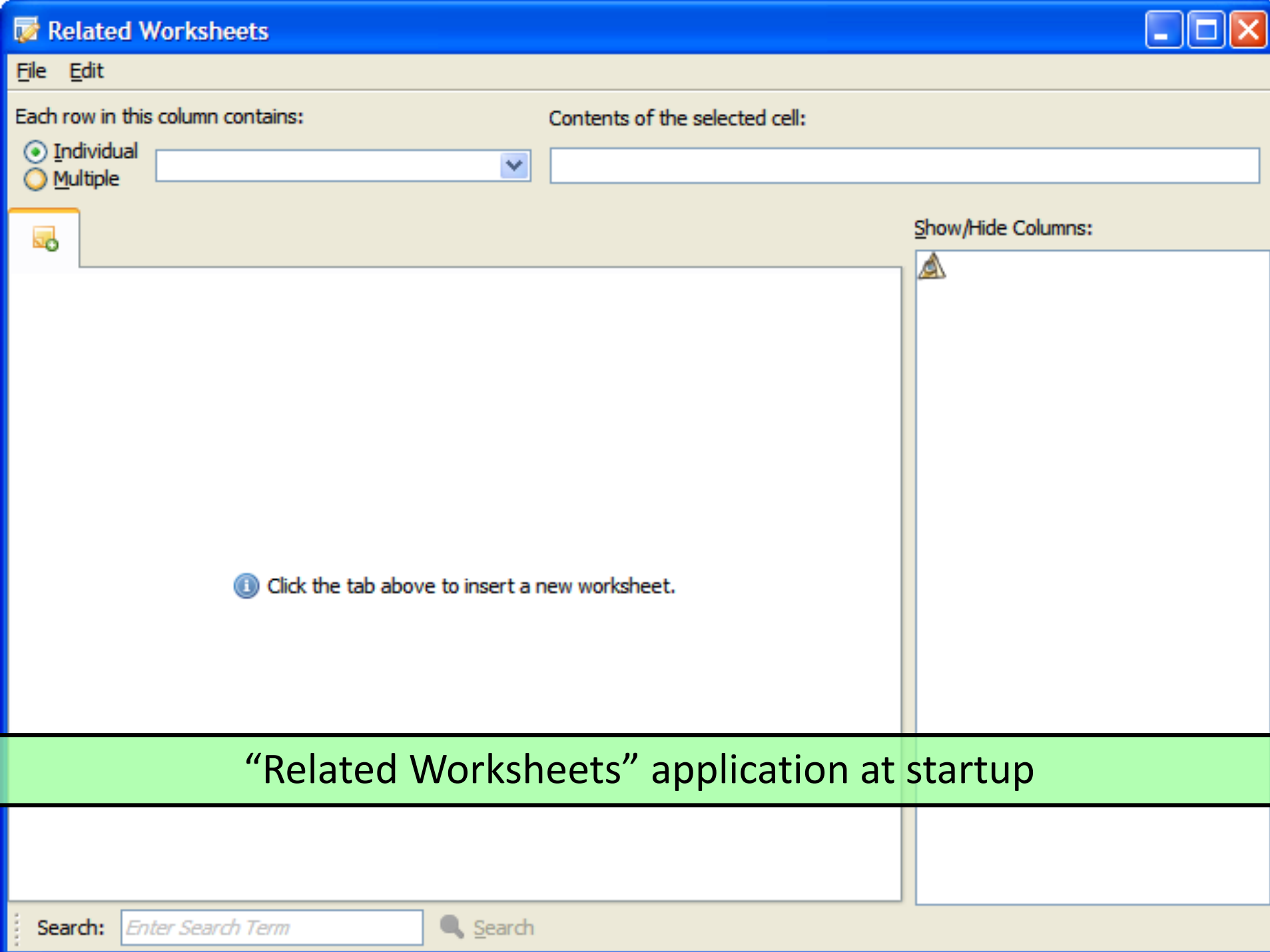
Course Codes	Dist. Area	Title	Reading List	Sections
CLG 214	EC	Seminar: Wisdom, Sophistry, Philosophy: Exploits of Reason before Plato	Kirk, Raven, Schofield The Presocratic Philosophy Plato Rival Lovers, Theagoras Kerferd The Sophistic Movement Lloyd Magic, Reason and the Sophists	C01 T 13:30 FIRES B06M Adam Th 13:30 FIRES B06M
GER 520 ART 587		Topics in Literary and Cultural Theory	Robert Vischer On the Optical Sense Niklas Luhmann The Reality of the Social Walter Benn Michaels The Shape of the Social Mary Ann Doane The Emergence of the Novel Richard Powers Galatea 2.2 Melanie Klein Notes on Some Schizoanalytic Concepts	S01 M 13:30 MCCKH 363 Nellie
KOR 107		Intermediate Korean II	Klear Integrated Korean I Klear Integrated Korean II	C01 M 11:00 FRIST 207 Velma T 11:00 FRIST 207 Th 11:00 FRIST 207 C02 M 12:30 FRIST 205 Velma

Search: Search

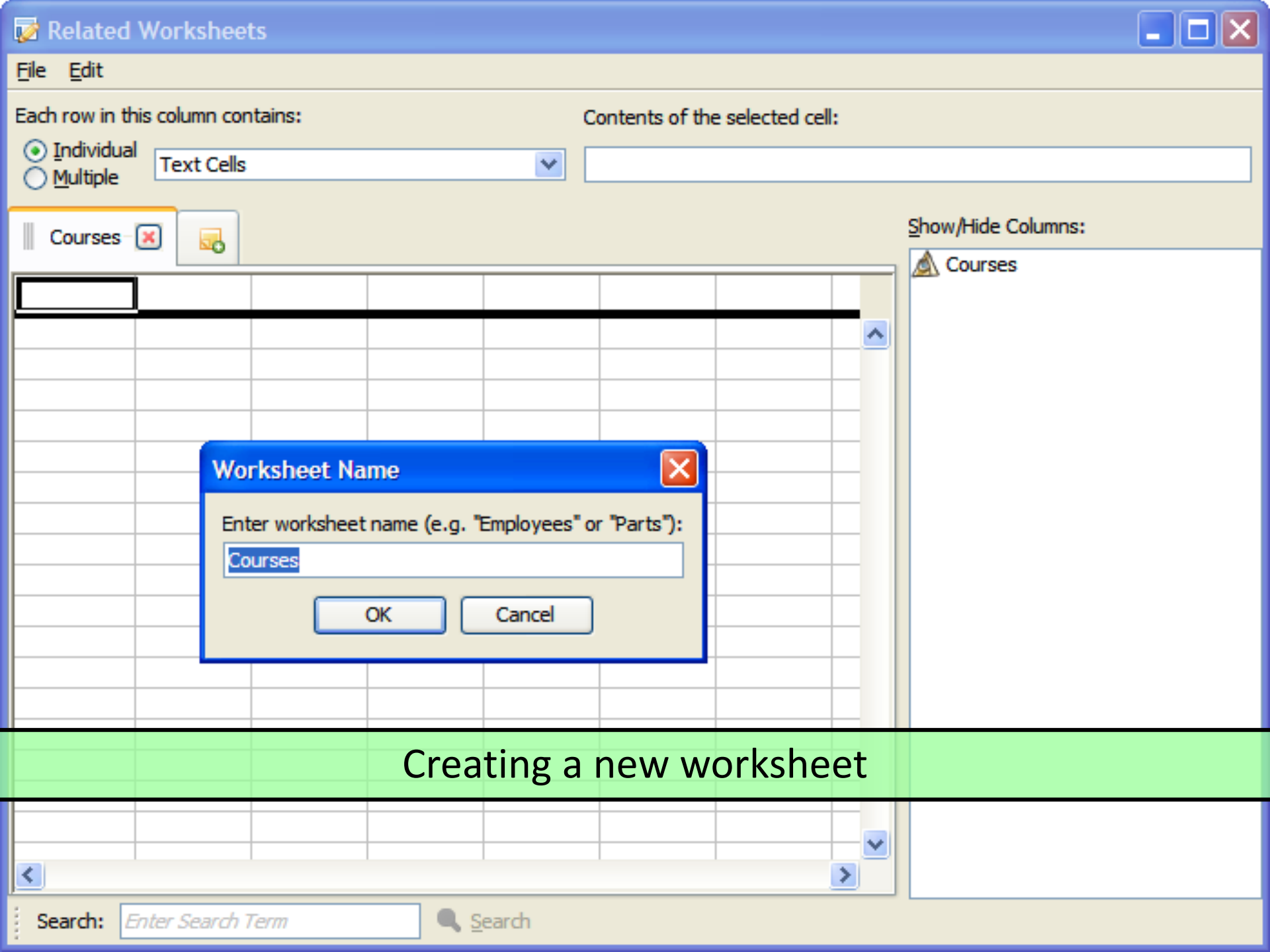
Show/Hide Columns:

- Courses
 - Course Codes
 - Dist. Area
 - Title
 - Max. Enrollment
 - May Audit?
 - Reading List
 - Course
 - Author Name
 - Title
 - Sections
 - Class Number
 - Course
 - Status
 - Max. Enrollment
 - Section
 - Meetings
 - Section
 - Day
 - Time
 - Place
 - Instructors
 - First Name

A database with one-to-many and many-to-many relationships, accessed through a general-purpose, spreadsheet-like UI



“Related Worksheets” application at startup



Creating a new worksheet

Each row in this column contains: Contents of the selected cell:

Individual Text Cells
 Multiple

Courses

Show/Hide Columns:

- Courses
 - Code
 - Title

Code	Title			
CLG 214	Wisdom, Sophistry, Philosophy			
GER 520	Literary and Cultural Theory			
KOR 107	Intermediate Korean II			
MAE 332	Aircraft Design			
MAT 554	Algebraic Geometry			
SPA 317	Protest and Dissent in Spain			
WWS 594	Topics in Policy Analysis			
CLA 330	Greek Law and Legal Practice			

After entering some simple, tabular data

Search: Search

Related Worksheets

File Edit

Each row in this column contains: Contents of the selected cell:

Individual Multiple Number Cells 30

Courses

Code	Title	Max. Enrollment	May Audit?
CLG 214	Wisdom, Sophistry, Philosophy	15	N
GER 520	Literary and Cultural Theor	20	Y
KOR 107	Intermediate Korean II	30	N
MAE 332	Aircraft Design	50	N
MAT 554	Algebraic Geometry	woops, I entered an invalid number	
SPA 317	Protest and Dissent in Spain	15	N
WWS 594	Topics in Policy Analysis	5	...maybe?
CLA 330	Greek Law and Legal Practic	30	Y

Show/Hide Columns:

- Courses
- Code
- Title
- Max. Enrollment
- May Audit?

Number Cells

- Text Cells
- Number Cells**
- Date Cells
- Yes-or-No Cells
- Items from Courses

1st New Concept: **Data Types** for Worksheet Columns

Related Worksheets



File Edit

Each row in this column contains:

Contents of the selected cell:

- Individual
- Multiple

Text Cells

ART 587

Courses



Show/Hide Columns:

- Code
- Title
- Max. Enrollment
- May Audit?

Code	Title	Max. Enrollment	May Audit?		
CLG 214	Wisdom, Sophistry, Philosophy	15	N		
GER 520	Literary and Cultural Theory	20	Y		
ART 587					
KOR 107	Intermediate Korean II	30	N		
MAE 332	Aircraft Design	50	N		
MAT 554	Algebraic Geometry	20			
SPA 317	Protest and Dissent in Spain	15	N		
WWS 594	Topics in Policy Analysis	5	Y		
CLA 330	Greek Law and Legal Practice	30	Y		
CHV 330					

2nd New Concept: Array Types

Search: Enter Search Term

Search

3rd New Concept: Reference Types

(“Each cell in this column refers to a row in a different worksheet”)



Each row in this column contains:

Contents of the selected cell:

- Individual
 Multiple

Items from Courses

CLG 214 / Wisdom, Sophistry, Philosophy

- || Courses || Readings  

Show/Hide Columns:

- Readings
- Author Name
 - Title
 - Course
 - Code
 - Title
 - Max. Enrollment
 - May Audit?
 - Readings (via "Course")

Author Name	Title	Course
Kirk	The Presocratic Philosophers	CLG 214
Raven		
Schofield		
Lysias	Selected Speeches	CLG 214
T.H.G. Megson	Aircraft Structures for Engineering Students	MAE 332
D.P. Raymer	Aircraft Design	MAE 332
Robert Vischer	On the Optical Sense of Form	GER 520 ART 587
Kerferd	The Sophistic Movement	
Carr	Spain: Dictatorship to Democracy	

Select an item from the "Contents" list above, or press Ctrl+Space to jump to this item

- CLG 214 / Wisdom, Sophistry, Philosophy
- (empty/new item)
- CLG 214 / Wisdom, Sophistry, Philosophy
- {GER 520, ART 587} / Literary and Cultural Theory
- KOR 107 / Intermediate Korean II
- MAE 332 / Aircraft Design
- MAT 554 / Algebraic Geometry
- SPA 317 / Protest and Dissent in Spain
- WWS 594 / Topics in Policy Analysis

- Items from Courses
- Text Cells
 - Number Cells
 - Date Cells
 - Yes-or-No Cells
 - Items from Courses
 - Items from Readings

Search

3rd New Concept: Reference Types

Reference values are displayed recursively, as configured by the user in the "Show/Hide Columns" tree

The screenshot shows a software interface with a table of courses and readings. At the top, there are tabs for 'Courses' and 'Readings'. The 'Courses' tab is active, and the table has columns for 'Code', 'Title', and 'Reading List'. The 'Reading List' column is expanded for the course 'GER 520 ART 587', showing a list of readings. A red arrow points from the 'Show/Hide Columns' panel to the 'Reading List' column header. The 'Show/Hide Columns' panel is a tree view with checkboxes for 'Code', 'Title', 'Max. Enrollment', 'May Audit?', 'Reading List', 'Author Name', and 'Course'. The 'Reading List' checkbox is checked, and its sub-items are also visible. A search dropdown is open at the bottom, showing a list of readings, with 'The Reality of the Mass Media' selected. A tooltip is visible over the selected reading, providing instructions on how to select an item from the 'Contents' list.

Code	Title	Reading List
CLG 214	Wisdom, Sophistry, Philosophy	The Presocratic Philosophers Selected Speeches The Sophistic Movement
GER 520 ART 587	Literary and Cultural Theory	On the Optical Sense of Form The Reality of the Mass Media The Shape of the Signifier Automatic Time Notes on Some Schizoid Mechanisms
KOR 107	Intermediate Korean II	Aircraft Design
MAE 332	Aircraft Design	Aircraft Structures for Engineering Students Aircraft Design
MAT 554	Algebraic	

Select an item from the "Contents" list above, or press Ctrl+Space to jump to this item

Search: Search

4th New Concept: Relationships are **bidirectional**

Each row in this column contains:

- Individual
- Multiple

Items from Courses

Contents of the selected cell:

CLG 214 / Wisdom, Sophistry, Philosophy

Courses

Readings

Show/Hide Columns:

- Readings
 - Author Name
 - Title
 - Course
 - Code
 - Title
 - Max. Enrollment
 - May Audit?
 - Readings (via "Course")

Author Name	Title	Course
Kirk Raven Schofield	The Presocratic Philosophers	CLG 214
Lysias	Selected Speeches	CLG 214
T.H.G. Megson	Aircraft Structures for Engineering Students	MAE 332
D.P. Raymer	Aircraft Design	MAE 332
Robert Vischer	On the Optical Sense of Form	GER 520 ART 587
Kerferd	The Sophistic Movement	
Carr Raymond Juan Pablo Fusi	Spain: Dictatorship to Democracy	
Katriel Tamer	Communal Webs	
Hamilton, ed.	The New Deal	

Select an item from the "Contents" list above, or press Ctrl+Space to jump to this item

1

Search:

4th New Concept: Relationships are **bidirectional**

Each row in this column contains:

- Individual
 Multiple

Items from Readings

Contents of the selected cell:

Lysias / Selected Speeches

Courses

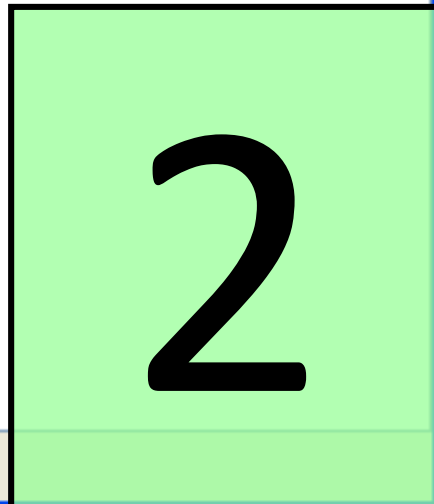
Readings

Show/Hide Columns:

- Courses
 - Code
 - Title
 - Max. Enrollment
 - May Audit?
 - Readings (via "Course")
 - Author Name
 - Title
 - Course

Code	Title	Max. Enrollment	May Audit?	Readings (via "Course")
CLG 214	Wisdom, Sophistry, Philosophy	15	N	Kirk The Presoc Raven Schofield Lysias Selected S
GER 520 ART 587	Literary and Cultural Theory	20		Opti
KOR 107	Intermediate Korean II	30	N	
MAE 332	Aircraft Design	50	N	T.H.G. Megson Aircraft Stru Students D.P. Raymer Aircraft Des
MAT 554	Algebraic Geometry	20		
SPA 317	Protest and	15	N	

Select an item from the "Contents" list above, or press Ctrl+Space to jump to this item



Search: Search

4th New Concept: Relationships are bidirectional

Related Worksheets

File Edit

Each row in this column contains: Contents of the selected cell:

Individual Multiple

Items from Readings Lysias / Selected Speeches

Courses Readings

Code	Title	Max. Enrollment	May Audit?	Readings (via "Course")
CLG 214	Wisdom, Sophistry, Philosophy	15	N	Kirk Raven Schofield Lysias
GER 520 ART 587	Literary and Cultural Theory	20		
KOR 107	Intermediate Korean II	30	N	
MAE 332	Aircraft Design	50	N	T.H.G. Megson D.P. Raymer
MAT 554	Algebraic Geometry	20		
SPA 317	Protest and	15	N	

Select an item from the "Contents" list above or press Ctrl+Space to jump to this item

Search: Enter Search Term Search

1

Related Worksheets

File Edit

Each row in this column contains: Contents of the selected cell:

Individual Multiple

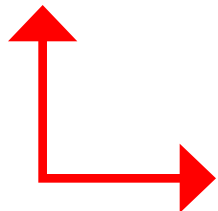
Items from Courses CLG 214 / Wisdom, Sophistry, Philosophy

Courses Readings

Author Name	Title	Course
Kirk Raven Schofield	The Presocratic Philosophers	CLG 214
Lysias	Selected Speeches	CLG 214
T.H.G. Megson	Aircraft Structures for Engineering Students	MAE 332
D.P. Raymer	Aircraft Design	MAE 332
Robert Vischer	On the Optical Sense of Form	GER 520 ART 587
Kerferd	The Sophistic Movement	
Carr Raymond Juan Pablo Fusi	Spain: Dictatorship to Democracy	
Katriel Tamer	Communal Webs	
Hamilton, ed.	The New Deal	

Search: Enter Search Term Search

2



Teleport Feature
(Press Ctrl+Space)

Related Worksheets

File Edit

Each row in this column contains: Contents of the selected cell:

Individual
 Multiple

Text Cells ART 587

Courses
 Readings
 Sections
 Meetings
 Instructors
 Grading Categories
 Grading Components

Show/Hide Columns:

- Courses
 - Course Codes
 - Dist. Area
 - Title
 - Max. Enrollment
 - May Audit?
 - Reading List
 - Course
 - Author Name
 - Title
 - Sections
 - Class Number
 - Course
 - Status
 - Max. Enrollment
 - Section
 - Meetings
 - Section
 - Day
 - Time
 - Place
 - Instructors
 - First Name

Course Codes	Dist. Area	Title	Reading List	Sections	
CLG 214	EC	Seminar: Wisdom, Sophistry, Philosophy: Exploits of Reason before Plato	Kirk, Raven, Schofield Plato Kerferd Lloyd	The Presocratic Philosophers Rival Lovers, Theaetetus The Sophistic Movement Magic, Reason and	C01 T 13:30 FIRES B06M Adam Th 13:30 FIRES B06M
GER 520 ART 587		Topics in Literary and Cultural Theory	Robert Vischer Niklas Luhmann Walter Benn Michaels Mary Ann Doane Richard Powers Melanie Klein	On the Optical Sense The Reality of the Individual The Shape of the Subject The Emergence of the Subject Galatea 2.2 Notes on Some Subjects	S01 M 13:30 MCCKH 363 Nellie
KOR 107		Intermediate Korean II	Klear Klear	Integrated Korean I Integrated Korean II	C01 M 11:00 FRIST 207 Velma T 11:00 FRIST 207 Th 11:00 FRIST 207 C02 M 12:30 FRIST 205 Velma

Search: Search

Result: The ability to keep track of one-to-many/many-to-many relationships from within a spreadsheet-like user interface

User Study

User Study

- Hypothesis: Excel-proficient users will be faster at lookup (read-only) tasks on a database stored in normalized form in our system vs. Microsoft Excel

The screenshot displays a Microsoft Excel spreadsheet with a 'Related Worksheets' pane open. The spreadsheet contains a table with columns for Course, Distribution Area, Title, Reading List, and Sections. The 'Related Worksheets' pane shows a search for 'ART 587' and lists the following data:

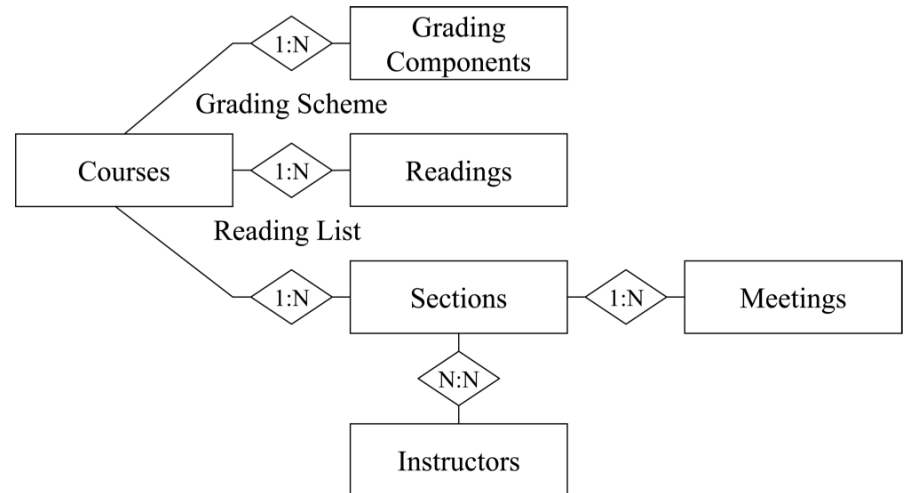
Course Codes	Dist. Area	Title	Reading List	Sections
CLG 214	EC	Seminar: Wisdom, Sophistry, Philosophy: Exploits of Reason before Plato	Kirk, Raven, Schofield Plato Kerferd Lloyd	C01 T 13:30 FIRES B06M Adam Merwin Th 13:30 FIRES B06M
GER 520		Topics in Literary and Cultural Theory	Robert Vischer Niklas Luhmann Walter Benn Michaels Mary Ann Doane Richard Powers Melanie Klein	S01 M 13:30 MCCKH 363 Nellie Mcdougal
KOR 107		Intermediate Korean II	Klear Klear	C01 M 11:00 FRIST 207 Velma Wicks T 11:00 FRIST 207 Th 11:00 FRIST 207 C02 M 12:30 FRIST 205 Velma Wicks
MAE 332		Aircraft Design	D.P. Raymer T.H.G. Megson, T. U.G. Megson	L01 M 13:30 FRIEN 008 Loretta Roy W 13:30 FRIEN 008
MAT 554		Algebraic Geometry		C01 M 13:30 FINEH 601 Steven Burkhalter
SPA 317	LA	Topics in the Cultural Expression of Protest and Dissent in Spain	Carr, Raymond, and Juan Pablo Fusi	L01 T 11:00 MCCOH 60 Robert Mellott P01 Th 11:00 MCCOH 60 Robert Mellott

User Study

- Mechanical Turk
- Remotely screen-recorded
- Lookup tasks on course catalog database in Excel vs. Related Worksheets
- Between-subjects study
- Initial qualification task on Excel only

User Study

#	Description
1	Find a course that is taught by Harry Morrill.
2	In the course “MUS 105: Music Theory Through Performance and Composition,” what percentage of the final grade is derived from the Midterm Exam?
3	Find a course that satisfies the “LA” (Literature and the Arts) distribution area, with a lecture (meetings belonging to a section denoted “L01”) that starts after noon (after 12.00).
4	What is the e-mail address of the instructor who teaches “KOR 107: Intermediate Korean II”?
5	Who teaches the precept section of “HIS 383: The United States Since 1920” that meets on Wednesdays at 10am?



Results:

Demographics

<i>“How often do you typically use spreadsheet software?”</i>		<i>N</i>
1	Never	1
2	Once a year or less	1
3	A couple of times per year	1
4	A couple of times per month	12
5	A couple of times per week	5
6	Almost daily	10
7	Multiple times per day	6
Total		36

<i>Occupation</i>	<i>N</i>	<i>Average spreadsheet experience</i>
Student, business/finance	2	6.0
Student, mechanical engineering	1	4.0
Student, unknown	1	2.0
Teacher	2	4.0
Business administration	5	5.6
Business process outsourcing (BPO)	3	6.0
Homemaker	5	3.2
Programmer	8	5.8
Other IT	3	5.0
Other technical	5	5.6
Other non-technical	1	4.0
Total	36	5.1

Results: Correctness and Features Used

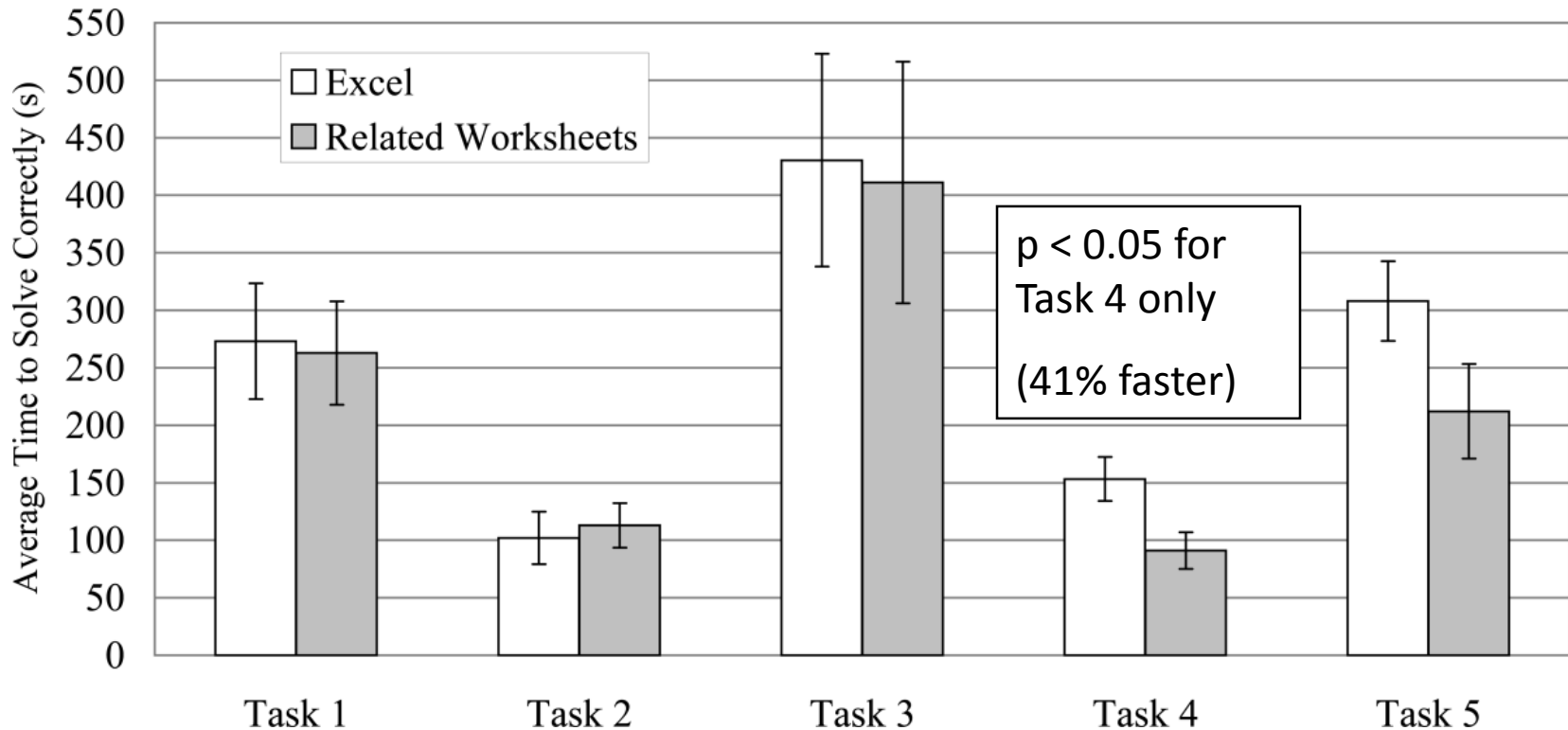
	<i>N</i>	<i>Task #</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Excel	18	18	18	14	17	12
RS	18	18	18	14	17	15

Number of subjects who solved each task correctly.

<i>Feature</i>	<i>Excel</i>	<i>Related Worksheets</i>
Search	76%	53%
Mark Rows	20%	12%
Filter	73%	
Sort	7%	
Teleport		44%
Show/Hide Columns		18%

Number of users observed to make use of specific features or techniques during the user study.

Results: Timing



#	Description
1	Find a course that is taught by Harry Morrill.
2	In the course “MUS 105: Music Theory Through Performance and Composition,” what percentage of the final grade is derived from the Midterm Exam?
3	Find a course that satisfies the “LA” (Literature and the Arts) distribution area, with a lecture (meetings belonging to a section denoted “L01”) that starts after noon (after 12.00).
4	What is the e-mail address of the instructor who teaches “KOR 107: Intermediate Korean II”?
5	Who teaches the precept section of “HIS 383: The United States Since 1920” that meets on Wednesdays at 10am?

Conclusion

- Spreadsheets are great homebrew databases
 - But struggle with multiple tables, nesting, joins
- Enhance spreadsheet paradigm with
 - Column type system, array types, reference types
 - Bidirectional hierarchical views of reference types
 - to handle plural relationships
- User Study shows system usable without instruction, sometimes faster than Excel (more study needed).

A Semantic Web Application?

- Implemented as a Java/Netbeans desktop app
- Which connects to SQL databases using JDBC
- But key contribution is interaction paradigm
 - Which expects arbitrary schemas
- Could easily be ported to the web
- E.g. on Google Spreadsheets
- So is a Semantic Web application despite absence of Semantic Web technology

Huynh, Benson, Marcus, Karger, Miller

**“I WANT TO PUBLISH MY
VOLUNTEER ROSTER ON THE WEB”**

Huynh, Benson, Marcus, Karger, Miller

Exhibit: Lightweight Structured Data Publishing [WWW 2007]

The web page as a WYSIWYG end-user customizable database-backed information management application [UIST 2010]

Talking about Data: Sharing Richly Structured Information through Blogs and Wikis [ISWC 2010]

WEB AUTHORIZING WITH STRUCTURED DATA

Motivation

SOME WEB HISTORY



```
Source of: http://people.csail.mit.edu/karger/ - Mozilla Firefox
File Edit View Help
<H1>David R. Karger
</H1>
<table border="0">
<tr valign=baseline>
<td>
<A HREF="karger300.jpg"> <IMG SRC="http://www.csail.mit.edu/biographies/PI/72dpi/karger.jpg"
alt="my picture" align=top> </A>
</td>
<td>
<address>
<A HREF="http://web.mit.edu/">MIT</A>
<A HREF="http://www.csail.mit.edu/">
Intelligence Laboratory</A>
<BR>
<A HREF="http://www.csail.mit.edu/reso
<BR>
The Stata Center, <A
HREF="http://whereis.mit.edu/map-jpg?s
32</A>
<BR>
<A
HREF="http://www.mapquest.com/maps/map
Vassar St.
</A>
<BR>
<A HREF="http://www.ci.cambridge.ma.
HREF="http://www.mass.gov/">MA</A> 021
<BR>
(617)-258-6167 (office) <BR>
```

David R. Karger - Mozilla Firefox

http://people.csail.mit.edu/karger/

Mail :: Inbox (53) David R. Karger

Enrico Motta



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<http://people.csail.mit.edu/karger/>

I am a member of the [Computer Science and Artificial Intelligence Laboratory](#) in the [EECS](#) department at [MIT](#). My interests include [information retrieval](#) (particularly our [haystack project](#)) and [analysis of algorithms](#). I have also spent some time working at [Akamai](#) and consulting for [Google](#) and [Vanu Inc.](#)

My (postscript) resume is [here](#).

I am currently teaching [6.S09: Advanced Algorithms](#) (supplanting the old 6.001 and 6.66) and [6.S06: Fundamentals of Algorithms](#).

This site contains, among other things, a list of my [publications](#) (also as [flat list](#)).

Bookmarks

General Haystack

Done

good old days ... early 1990s

timbl's blog

OpenID Login

OpenID:

Log In

[authorization help]

Username: *

Password: *

Log in

Request new password

Browse archives

< January 2009

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Done

Slashdot - News for nerds, stuff that matters - Mozilla Firefox

Log In Create Account Help Sub

Sections

- Main
- Apple
- AskSlashdot
- Books
- Developers
- Games
- Hardware
- IT
- Idle
- Index
- Interviews
- Linux
- Mobile
- Politics
- Science
- Technology
- YRO
- Help
- FAQ
- Bugs
- Stories
- Old Stories
- Old Polls
- Topics
- Hall of Fame

Slashdot is powered by

Science Concepts

Posted by CmdrTaco from the wait-around category

eldavojohn writes

"Space.com reports that a project designed to capture the voices of people who are not taking is dubbed 'The Round Table' and is backed by the same group of samples of the round table that did some legwork for the was being used to map planets and the Chinese submission of this mission how water on Mars is not taking

Read More

Game Concepts

Posted by CmdrTaco from the wow-stuff category

An anonymous user writes

"Some UK researchers claim that is actually a disorder, by allowing Microsoft to

Done

Microsoft - Wikipedia, the free encyclopedia - Mozilla Firefox

W Micros...

page discussion view source history



WIKIPEDIA
The Free Encyclopedia

A Thank You from
Wikipedia Founder Jimmy Wales

Microsoft

From Wikipedia, the free encyclopedia

Microsoft Corporation (NASDAQ: MSFT, HKEX: 4338) is a multinational computer technology corporation that develops, manufactures, licenses, and supports a wide range of software products for computing devices.^{[9][8]} Headquartered in Redmond, Washington, USA, its best selling products are the Microsoft Windows operating system and the Microsoft Office suite of productivity software.

Originally founded to develop and sell BASIC interpreters for the Altair 8800, Microsoft rose to dominate the home computer operating system market with MS-DOS in the mid-1980s, followed by the Windows line of operating systems. Its products have all achieved near-ubiquity in the desktop computer market. One commentator notes that Microsoft's original mission was "a computer on every desk and in every home, running Microsoft software"—it is a goal near fulfillment.^[10] Microsoft possesses footholds in other markets, with assets such as the MSNBC cable television network, the MSN Internet portal, and the Microsoft Encarta multimedia encyclopedia. The company also markets both computer hardware products such as the Microsoft mouse as well as home entertainment products such as the Xbox, Xbox 360, Zune and MSN TV.^[9] The company released an initial public offering (IPO) in the stock market, which, due to the ensuing rise of the stock price, has made four billionaires and an estimated 12,000 millionaires from Microsoft employees.^{[14][12][13]}

Throughout its history the company has been the target of criticism, including monopolistic business practices and anti-competitive business practices including refusal to deal and tying. The U.S. Justice Department and the European Commission, among others, have ruled against Microsoft for various antitrust violations.^{[14][15]}

Known for what is generally described as a developer-centric business culture, Microsoft has historically given customer support over Usenet newsgroups and the

navigation

- Main page
- Contents
- Featured content
- Current events
- Random article

search

Go Search

interaction

- About Wikipedia
- Community portal
- Recent changes
- Contact Wikipedia
- Donate to Wikipedia
- Help

toolbox

- What links here
- Related changes
- Upload file
- Special pages
- Printable version
- Permanent link
- Cite this page

languages

- Afrikaans
- Alemannisch
- العربية
- Anglo-Saxon
- Asturianu

Done

Wiki

Microsoft Corporation

Microsoft

Type Public (NASDAQ: MSFT)

Founded Albuquerque, New Mexico (April 4, 1975)^[1]

Founder(s) Bill Gates Paul Allen

Headquarters Redmond, Washington, United States

Area served Worldwide

Key people Bill Gates (Chairman) Steve Ballmer (CEO) Ray Ozzie (CSA) Craig Mundie (CRSO)

Industry Computer software Publishing Research and development Computer hardware Video games

Products Microsoft Windows Microsoft Office Microsoft Servers Developer Tools Microsoft Expression

http://en.wikipedia.org/wiki/Main_Page

Blog

Forum

The Virtuous Cycle of Web Authoring

	High Benefit	Low Cost
Reader	<ul style="list-style-type: none">• Find the info I need• Discover new things	<ul style="list-style-type: none">• One click fetch• Instant availability• No application to master
Author	<ul style="list-style-type: none">• Be seen• Share what I know• Impress people• Readers' gratitude	<ul style="list-style-type: none">• No new skills needed• Easy to author

Structured Data is Better

- Easier to manage
 - Separate content (data) from presentation
 - Edit data, changes propagate to all uses of it
 - Templates help all data look consistent
- Easier to navigate
 - Sorting and filtering
 - Faceted browsing
 - Aggregate visualizations --- compare/contrast
- Easier to reuse
 - Extract from original source
 - Blend with other data
 - Create alternative visualizations

Vietnamese Recipes at Epicurious.com

Back Forward Reload Stop Home Search Bookmarks

epicuriously

epishop • video • forums

RECIPES FEATURES COOKING DRINKING RESTAURANTS MEMBERS

recipe search GO
advanced search • browse

Member? [Log In.](#)
Not a member? [Register here!](#)

recipe collections • slideshows • forums • find a recipe

browse

browse all recipes
search our drinks database

browsing by: Vietnamese

filter

refine by: [Main Ingredient](#) | [Course](#) | [Dish](#) | [Season/Occasion](#) | [Recipe Category](#) | [Preparation](#) | [Healthy Options](#)

Beans (1)	Fruits (7)	Mushrooms (4)	Pork (5)	Soy (3)
Beef (13)	Garlic (6)	Nuts (3)	Potatoes (1)	Tomatoes (1)
Chicken (8)	Ginger (2)	Onions (4)	Poultry (7)	Vegetables (8)
Citrus (6)	Greens (7)	Pasta (13)	Rice (6)	
Fish (5)	Herbs (10)	Peppers (6)	Shellfish (11)	

55 recipes found for: Vietnamese

sort results by

rating	recipe name	at a glance
	HANOI TURMERIC GRILLED FISH WITH DILL AND ONION Epicurious, October 2006	
	GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY Epicurious, October 2006	
	SHAKING BEEF Epicurious, October 2006	
	HUE NOODLE SOUP Bon Appétit, January 2006	

template

APPÉTIT Gourmet

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SHOP ON EPICURIUS

Our Appliance Specialists will help you to select the right appliances.

LG Side-by-Side Refrigerator, White
Easily programmable

SHOP NOW

BEST BUY

Done



Link to this page | Save this Search | List Search

Sign in | Create an Account
My Favorites | My Searches
My Account | List a Place

ZOOM + -

Listing Type: All Types Price: Min: \$ 0 Max: \$ 6000+
 Bedrooms: Studio 1 2 3+ No Price Specified

Points of Interest

- Public Schools
- Private Schools
- Colleges etc.
- Public Transportation

AREAS

- States
- Counties
- Cities
- ZIPs
- Congress
- Show Borders
- Heat Maps

PROPERTIES


- Show New
- Show Favorites
- Show Viewed
- Ghost Viewed

MESSAGES

today




Mere mortals just write text or html



The screenshot shows a Mozilla Firefox browser window with the title "David R. Karger - Mozilla Firefox". The address bar contains the URL "http://people.csail.mit.edu/karger/". The browser's toolbar includes navigation buttons (back, forward, home, stop, refresh) and various extensions like "xhibit real estate", "ABP", and "123". The page content features a header with the name "David R. Karger" and a profile picture of a man with glasses wearing a red shirt. To the right of the photo is contact information: "MIT, Computer Science and Artificial Intelligence Laboratory", "Room G592", "The Stata Center, Building 32", "32 Vassar St.", "Cambridge, MA 02139", "(617)-258-6167 (office)", "(617)-253-3480 (fax)", "karger@mit.edu", and "http://people.csail.mit.edu/karger/". Below this is a paragraph of text: "I am a member of the Computer Science and Artificial Intelligence Laboratory in the EECS department at MIT. My interests include information retrieval (particularly our haystack project) and analysis of algorithms. I have also spent some time working at Akamai and consulting for Google and Vanu Inc." This is followed by "My (postscript) resume is here." and "I am currently teaching 6.854: Advanced Algorithms. At other times I teach 6.001 and 6.856: Randomized Algorithms." The final paragraph states "This site contains, among other things, a list of my publications (also as flat list)." At the bottom, there is a "Bookmarks" section with two items: "General" and "Haystack". The browser's status bar at the bottom shows "Done" and several system icons.

David R. Karger

 [MIT, Computer Science and Artificial Intelligence Laboratory](http://people.csail.mit.edu/karger/)
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Bookmarks

General Haystack

Why?

- Professional sites implement a **rich data model**
 - Information stored in databases
 - Extracted using complex queries
 - Results feed into templating web frameworks
- Plain authors left behind
 - Can't install/operate/define a database
 - Can't write the queries to extract the data
 - Limited to unstructured text pages (and blogs/ wikis)
 - Less power to communicate effectively
 - Less interest in publishing data

Goal

- Give regular people tools that let them author structured data and visualizations themselves
- So can communicate like professional web sites
 - their incentive
- And their data is available in high fidelity for combination and reuse with other data
 - social benefit

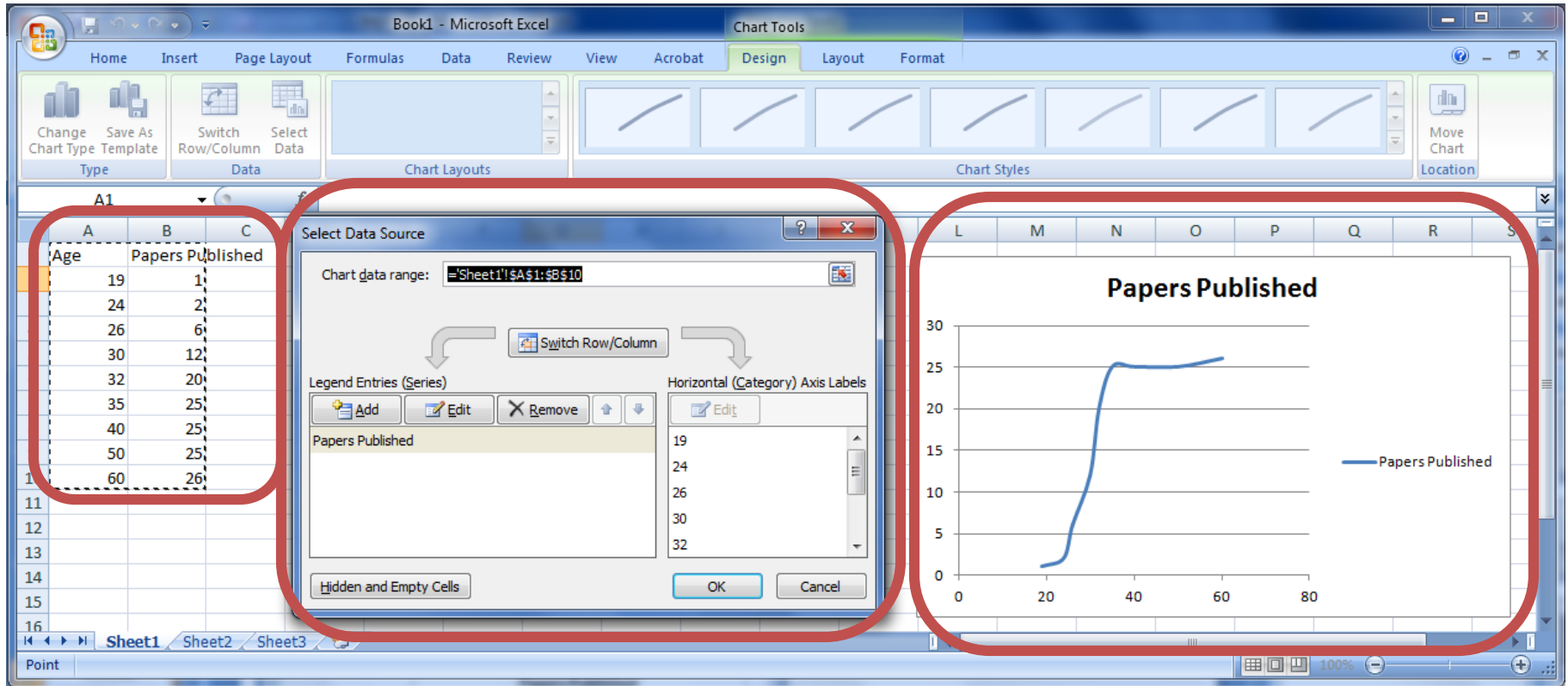
Do We Need This?

- Analyzed 21 Blogs in 2009
 - Top 10 and Trending 10 from Technorati
 - Last 10 articles of each
- 18 of 21 blogs (30% of articles) had at least one article with a collection of data items
 - Half described in text
 - Half as html table or static info-graphic
 - None had interactive data

Approach

- Publishing data is easy
 - Just put a spreadsheet online
 - Rows are items, columns are properties
- Identify key elements of interactive visualizations
 - Like spreadsheet charts
- Add them to the HTML document vocabulary
 - Insert them like images or videos today
- Configure by binding them to underlying data

Like Spreadsheets



- Put data in Spreadsheet
 - Items are rows, properties are columns
- Pick a chart type (visualization)
- Specify which columns used in chart

Example: HTML

- Standardized vocabulary for document structure
 - Paragraphs, headings, italics, quotations
- A description of the document
 - Not an imperative program for generating it
- User describes structure
 - Browser generates presentation based on it

Generalize to Data

- Identify common vocabulary describing
 - Data
 - Visualizations of that data
 - Interactions with that data
- Augment HTML to include data vocabulary
- User authors description of data, viz, interaction
 - Describe, don't program
- Browser implements described visualization of and interaction with the data

Can This be Done?

- Is there a vocabulary that is
 - Simple enough for regular people to use
 - General enough to capture a good part of what people want to do with structured data authoring/publishing?

epicurious

epishop • video • forums

RECIPES FEATURES COOKING DRINKING RESTAURANTS MEMBERS

recipe search
 GO
advanced search · browse

Member?
Log In.
Not a member?
Register here!

recipe collections · slideshows · forums · find a recipe

search

BON APPÉTIT *Gourmet*
read · subscribe

browse

filter

browsing by: Vietnamese

refine by: Main Ingredient | Course | Dish | Season/Occasion | Recipe Category | Preparation | Healthy Options

- Beans (1) Fruits (7) Mushrooms (4) Pork (5) Soy (3)
- Beef (13) Garlic (6) Nuts (3) Potatoes (1) Tomatoes (1)
- Chicken (8) Ginger (2) Onions (4) Poultry (7) Vegetables (8)
- Citrus (6) Greens (7) Pasta (13) Rice (6)
- Fish (5) Herbs (10) Peppers (6) Shellfish (11)



55 recipes found for: Vietnamese

sort results by

Best Match

sort

rating	recipe name	at a glance
	HANOI TURMERIC GRILLED FISH WITH DILL AND ONION Epicurious, October 2006	
	GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY Epicurious, October 2006	
	SHAKING BEEF Epicurious, October 2006	
	HUE NOODLE SOUP Bon Appétit, January 2006	

template

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Our Appliance Specialists will help you to select the right appliances.

SHOP NOW

LG
Side-by-Side Refrigerator, White
Easily programmable

BEST BUY

Vietnamese Recipes at Epicurious.com

Back Forward Reload Stop Home <http://www.epicuric> Search ☆ Bookmar

epicurious

epishop • video • forums

RECIPES FEATURES COOKING DRINKING RESTAURANTS MEMBERS

recipe search GO
advanced search • browse

Member? Log In. Not a member? Register here!

recipe collections • slideshows • forums • find a recipe

browse

advanced search
browse all recipes
search our drinks database

browsing by: Vietnamese

refine by: Main Ingredient | Course | Dish | Season/Occasion | Recipe Category | Preparation | Healthy Options

Beans (1)	Fruits (7)	Mushrooms (4)	Pork (5)	Soy (3)
Beer (42)	Garlic (6)	Nuts (3)	Potatoes (1)	Tomatoes (1)
Chicken (8)	ginger (2)	Onions (4)	Poultry (7)	Vegetables (8)
Citrus (6)	Greens (7)	Pasta (13)	Rice (6)	
Fish (5)	Herbs (10)	Peppers (6)	Shellfish (11)	

55 recipes found for: Vietnamese

sort results by Best Match

rating	recipe name	at a glance
🍴🍴🍴	HANOI TURMERIC GRILLED FISH WITH DILL AND ONION Epicurious, October 2006	
	GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY Epicurious, October 2006	🕒
🍴🍴🍴	SHAKING BEEF Epicurious, October 2006	
🍴🍴🍴	HUE NOODLE SOUP Bon Appétit, January 2006	

Done

BON APPÉTIT Gourmet

read • subscribe

SHOP ON EPICURIUS

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Our Appliance Specialists will help you to select the right appliances.

SHOP NOW

LG Side-by-Side Refrigerator, White

Easily programmable

BEST BUY

Image

HTML:
<img
src=...



epicurious

[epishop](#) • [video](#) • [forums](#)
[RECIPES](#) [FEATURES](#) [COOKING](#) [DRINKING](#) [RESTAURANTS](#) [MEMBERS](#)
[recipe collections](#) • [slideshows](#) • [forums](#) • [find a recipe](#)

browse

[advanced search](#)
[browse all recipes](#)
[search our drinks database](#)

browsing by: Vietnamese

 refine by: [Main Ingredient](#) | [Course](#) | [Dish](#) | [Season/Occasion](#) | [Recipe Category](#) | [Preparation](#) | [Healthy Options](#)

Beans (1)	Fruits (7)	Mushrooms (4)	Pork (5)	Soy (3)
Beef (13)	Garlic (6)	Nuts (3)	Potatoes (1)	Tomatoes (1)
Chicken (8)	Ginger (2)	Onions (4)	Poultry (7)	Vegetables (8)
Citrus (6)	Greens (7)	Pasta (13)	Rice (6)	
Fish (5)	Herbs (10)	Peppers (6)	Shellfish (11)	

55 recipes found for: Vietnamese

sort results by

rating	recipe name	at a glance
--------	-------------	-------------

	HANOI TURMERIC GRILLED FISH WITH DILL AND ONION Epicurious, October 2006	
--	--	--

	GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY Epicurious, October 2006	
--	---	--

	SHAKING BEEF Epicurious, October 2006	
--	---	--

	HUE NOODLE SOUP Bon Appétit, January 2006	
--	---	--

Data

- Items (Recipes)
- Each has properties
 - Title
 - Source magazine
 - Publication date
 - Rating
 - Ingredients
- Publish as spreadsheet
 - One item per row
 - Columns for properties

Vietnamese Recipes at Epicurious.

Back Forward Reload Stop Home <http://www.epicurio>

epicurious [epishop](#) • [video](#) • [forums](#)

RECIPES FEATURES COOKING DRINKING RESTAURANTS MEMBERS

[recipe collections](#) • [slideshows](#) • [forums](#) • [find a recipe](#)

[advanced search](#)
[browse all recipes](#)
[search our drinks database](#)

browse

browsing by: Vietnamese

refine by: [Main Ingredient](#) | [Course](#) | [Dish](#) | [Season/Occasion](#) | [Recipe Category](#) | [Preparation](#) | [Healthy Options](#)

Beans (1)	Fruits (7)	Mushrooms (4)	Pork (5)	Soy (3)
Beef (13)	Garlic (6)	Nuts (3)	Potatoes (1)	Tomatoes (1)
Chicken (8)	Ginger (2)	Onions (4)	Poultry (7)	Vegetables (8)
Citrus (6)	Greens (7)	Pasta (13)	Rice (6)	
Fish (5)	Herbs (10)	Peppers (6)	Shellfish (11)	

55 recipes found for: Vietnamese sort results by

rating	recipe name	at a glance
	HANOI TURMERIC GRILLED FISH WITH DILL AND ONION Epicurious, October 2006	
	GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY Epicurious, October 2006	
	SHAKING BEEF Epicurious, October 2006	
	HUE NOODLE SOUP Bon Appétit, January 2006	

Done

Views

- Show a collection
 - Bar chart
 - Sortable list (here)
 - Map
 - Thumbnail set
- Bound to properties
 - Sort by property?
 - Plot which property?

- HTML:

```
<div ex:role="view"  
  ex:viewClass="list"  
  ex:sort="price"/>
```

The screenshot shows a web browser window displaying the Epicurious website. The page title is "Vietnamese Recipes at Epicurious". The browser's address bar shows "http://www.epicurio". The website's navigation menu includes "epicurious", "epishop", "video", "forums", "RECIPES", "FEATURES", "COOKING", "DRINKING", "RESTAURANTS", and "MEMBERS". Below the navigation, there are links for "recipe collections", "slideshows", "forums", and "find a recipe". The main content area is titled "browse" and includes an "advanced search" link and a "browse all recipes" link. The page is filtered by "Vietnamese" and shows a list of ingredients with their counts: Beans (1), Beef (13), Chicken (8), Citrus (6), Fish (5), Fruits (7), Garlic (6), Ginger (2), Greens (7), Herbs (10), Mushrooms (4), Nuts (3), Onions (4), Pasta (13), Peppers (6), Pork (5), Potatoes (1), Poultry (7), Rice (6), Shellfish (11), Soy (3), Tomatoes (1), and Vegetables (8). The search results section shows "55 recipes found for: Vietnamese" and a "sort results by" dropdown menu set to "Best Match". The list of recipes includes "HANOI TURMERIC GRILLED FISH WITH DILL AND ONION", "GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY", "SHAKING BEEF", and "HUE NOODLE SOUP".

Facets

- Way to filter a collection
 - Specify a property
 - E.g. ingredient
 - User clicks to pick
 - Restrict collection to matching items

- HTML:

```
<div ex:role="facet"
```

```
ex:expression="ingredient"/>
```

The screenshot shows the Epicurious website interface. The browser address bar displays 'http://www.epicurio'. The website header includes the 'epicurious' logo and navigation links for 'epishop', 'video', and 'forums'. A secondary navigation bar lists 'RECIPES', 'FEATURES', 'COOKING', 'DRINKING', 'RESTAURANTS', and 'MEMBERS'. Below this, a sub-navigation bar includes 'recipe collections', 'slideshows', 'forums', and 'find a recipe'. The main content area is titled 'browse' and indicates 'browsing by: Vietnamese'. A 'refine by:' section lists various filters: 'Main Ingredient', 'Course', 'Dish', 'Season/Occasion', 'Recipe Category', 'Preparation', and 'Healthy Options'. A red box highlights the 'Main Ingredient' facet menu, which lists the following categories and counts: Beans (1), Beef (13), Chicken (8), Citrus (6), Fish (5), Fruits (7), Garlic (6), Ginger (2), Greens (7), Herbs (10), Mushrooms (4), Nuts (3), Onions (4), Pasta (13), Peppers (6), Pork (5), Potatoes (1), Poultry (7), Rice (6), Shellfish (11), Soy (3), Tomatoes (1), and Vegetables (8). Below the facet menu, the page shows '55 recipes found for: Vietnamese' and a 'sort results by' dropdown menu set to 'Best Match'. The recipe list includes: 'HANOI TURMERIC GRILLED FISH WITH DILL AND ONION' (Epicurious, October 2006), 'GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY' (Epicurious, October 2006), 'SHAKING BEEF' (Epicurious, October 2006), and 'HUE NOODLE SOUP' (Bon Appétit, January 2006). The browser status bar at the bottom shows 'Done'.

Lenses

- Template for item
- HTML with “fill in the blanks”

- HTML:

```
<div ex:role="lens">
```

```
  <b>
```

```
  <div ex:content="title"/>
```

```
  </b>
```

```
  <div ex:content="date"/>
```

```
</div>
```

Vietnamese Recipes at Epicurious.

Back Forward Reload Stop Home <http://www.epicurio>

epicurious epi shop • video • forums

RECIPES FEATURES COOKING DRINKING RESTAURANTS MEMBERS

recipe collections • slideshows • forums • find a recipe

browse [advanced search](#) [browse all recipes](#) [search our drinks database](#)

browsing by: Vietnamese

refine by: [Main Ingredient](#) | [Course](#) | [Dish](#) | [Season/Occasion](#) | [Recipe Category](#) | [Preparation](#) | [Healthy Options](#)

Beans (1)	Fruits (7)	Mushrooms (4)	Pork (5)	Soy (3)
Beef (13)	Garlic (6)	Nuts (3)	Potatoes (1)	Tomatoes (1)
Chicken (8)	Ginger (2)	Onions (4)	Poultry (7)	Vegetables (8)
Citrus (6)	Greens (7)	Pasta (13)	Rice (6)	
Fish (5)	Herbs (10)	Peppers (6)	Shellfish (11)	

55 recipes found for: Vietnamese sort results by

rating	recipe name	at a glance
	HANOI TURMERIC GRILLED FISH WITH DILL AND ONION Epicurious, October 2006	
	GREEN PAPAYA SALAD WITH BEEF AND LIVER JERKY Epicurious, October 2006	
	SHAKING BEEF Epicurious, October 2006	
	HUE NOODLE SOUP Bon Appétit, January 2006	

Done

Key Primitives of a Data Page

- **Data**
 - A spreadsheet
- **Lenses**
 - Explain how to display a single item
 - By describing what properties should be shown, and how
- **Views**
 - Ways of looking at collections of items
 - Lists, Thumbnails, Maps, Scatterplots
 - Specify which properties determine layout
- **Facets**
 - Elements for filtering or sorting information based on its structure

General Enough?

General Enough?

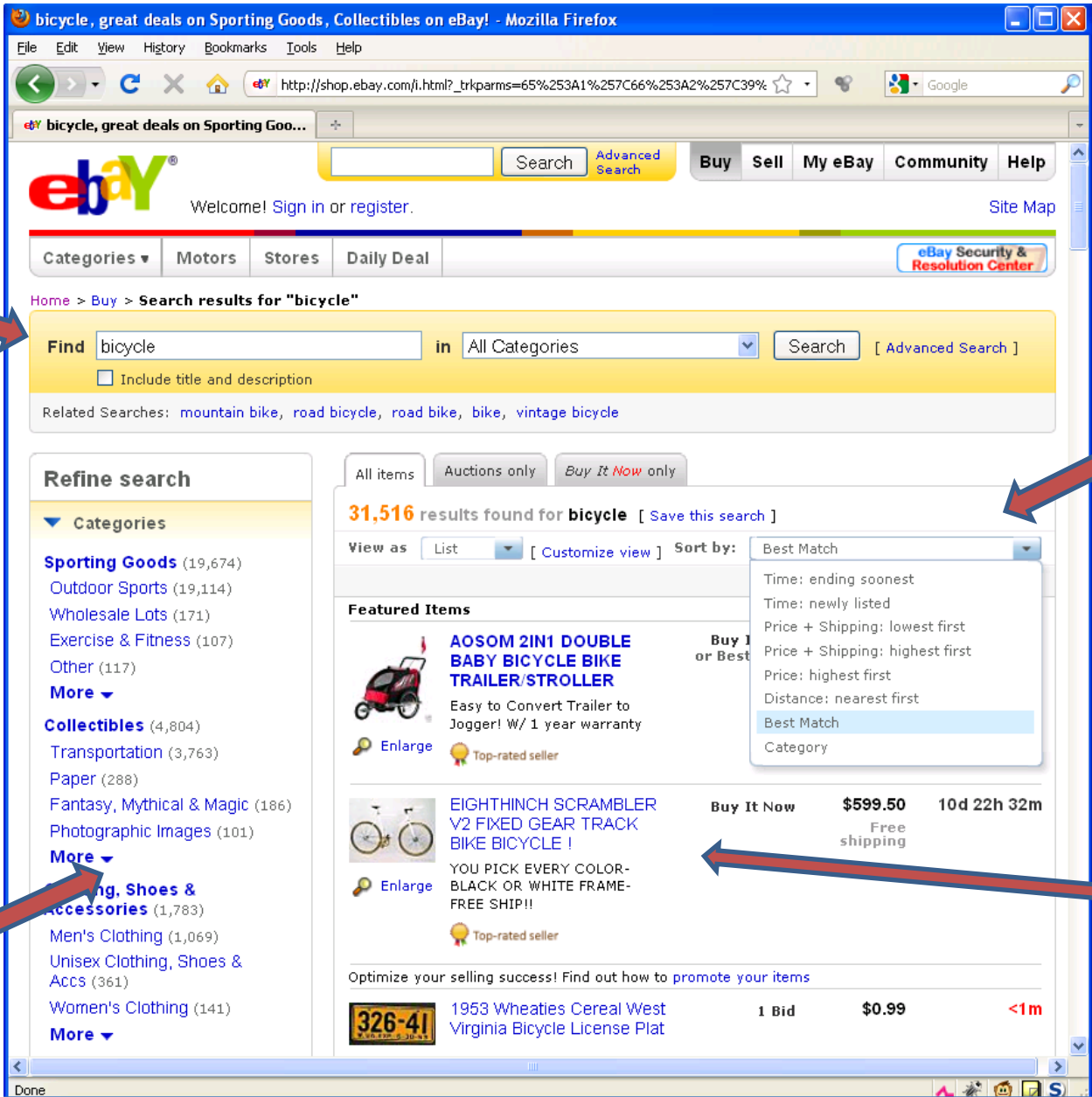
Text search

Sorting by Properties

The screenshot shows a Mozilla Firefox browser window displaying search results for 'fish' on Epicurious.com. The search bar at the top contains the text 'fish' and a 'go' button. Below the search bar, it indicates 'showing 1 - 10 of 1456' results. A 'sort by' dropdown menu is open, showing options: 'relevance' (selected), 'ratings', 'photo', 'name', and 'newest'. On the left side, there is a 'refine this search by...' section with various filters. The 'in season' filter is selected, and a pop-up window shows the following options: 'Fall (150)', 'Spring (156)', 'Summer (332)', and 'Winter (186)'. The search results list several recipes, each with a fork and knife icon, a photo, and the recipe name and source. The recipes shown are: 'Fish Tacos' (Epicurious, May 2009, *Simply Mexican*), 'Escolar Fish with Mango and Shrimp Ravioli' (Epicurious, June 2004), 'Traditional Fish Stock', and 'Bergen Fish Soup' (Epicurious, 1999, *The 2nd Avenue Deli Cookbook*).

Faceted Browsing

Templated Items

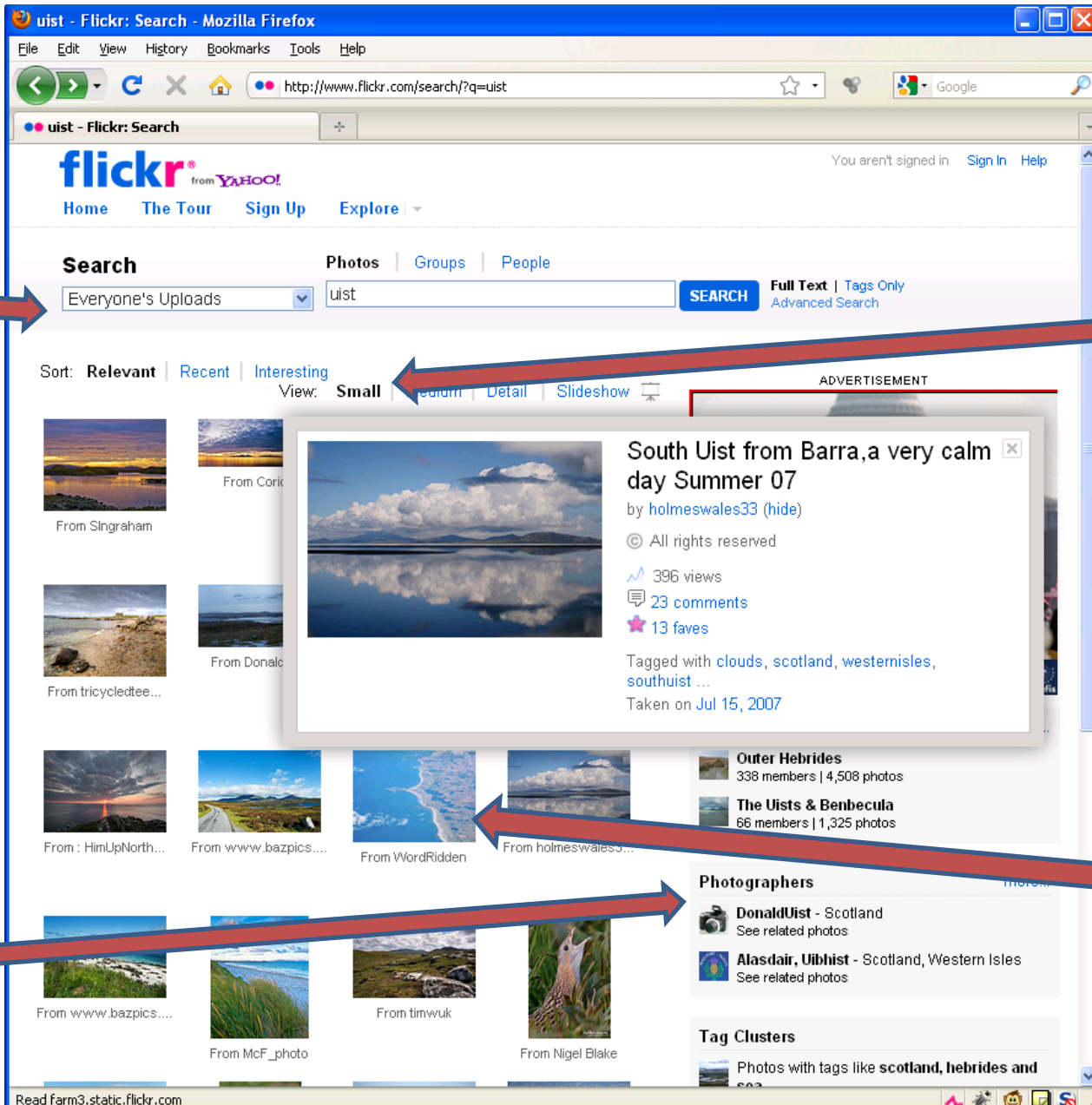


Text search

Sorting by Properties

Faceted Browsing

Templated Items



Text search

Sorting by Properties

Faceted Browsing

Templated Items

Text search

The screenshot shows a Mozilla Firefox browser window displaying the CNET Reviews website. The search results are for "phone" in the "Cell Phones" category, showing 1323 product results. The page includes a search bar, navigation tabs for various product categories, and a list of product results. A sorting dropdown menu is open, showing options like "Relevance", "Most popular", "Editors' rating", "User rating", "Review date", and "Lowest price".

Sorting by Properties

Faceted Browsing

Templated Items

Sorting by Properties

Text search

HousingMaps - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.housingmaps.com/

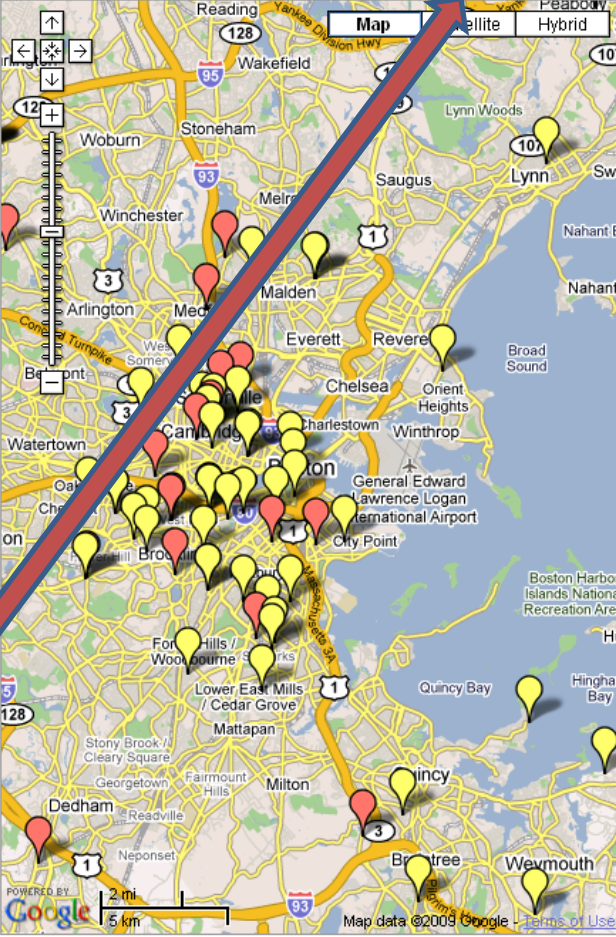
HousingMaps

For Rent For Sale Rooms Sublets

Powered by [craigslist](#) and [Google Maps](#)
(this site is in no way affiliated with craigslist)

City: Price: [Hide Filters](#) [Refresh](#) [Link](#)

Keywords: Rooms: Pictures Dogs Cats



pics	price	bd	description	city	date
	\$1500		Pristine Two Bedroom - Steps away from Tufts Univ!	Somerville	10/07
	\$1900	3bd	Free Rent* 3 BR Apartment Huron Village	Cambridge	10/07
	\$1550	2bd	2ba - *Reduced Price* Brand New Boston Condo	Dorchester	10/07
	\$1836	2bd	2x2 + Office WD Included, Bay Window Free Rent!	Canton	10/07
	\$1865	1bd	Distinctive Apartment Living is now in Medford!	Medford	10/07
	\$1750	1bd	1 Bedroom Apartment Available	Boston	10/07
	\$1500	1bd	Furnished One Bedroom In The Heart Of Boston Available November 1St!	Boston	10/07
	\$1700		Luxury one bedroom loft downtown, rooftop pool, fitness center	Boston	10/07
	\$1995	3bd	No Bank Qualify! Rent to Own, 3 Bed / 2.5 Bath House	Lynn	10/07
	\$1799	2bd	Luxury Apartments close to Commuter Boat Available	Hingham	10/07
	\$1800	3bd	3/4 bedroom in south quincy	Quincy	10/07
	\$1600	3bd	Lg. 3 BR in highly sought after neighborhood	Malden	10/07
	\$1500	2bd	Gracious Two Bedroom Townhouse	North Chelm:	10/07
	\$1760	1bd	1 bedroom - 3rd floor with fireplace, 800 sq ft! Luxury!	Burlington	10/07
	\$1920	2bd	Close Out Special! Luxury 1&2 bedrooms! 1-2 months free!	Burlington	10/07
	\$1500	3bd	3 Bedroom apartment available in Grove Hall	Boston	10/07
	\$1650	1bd	Charming Apartment w/ Many Amenities & Parking	Boston	10/07
	\$1650	2bd	Water front apartment available	Quincy	10/07
	\$1595		Modern Studio-ht,hw, a/c incl! Parking available. On Red & Green Lines!	Cambridge	10/07

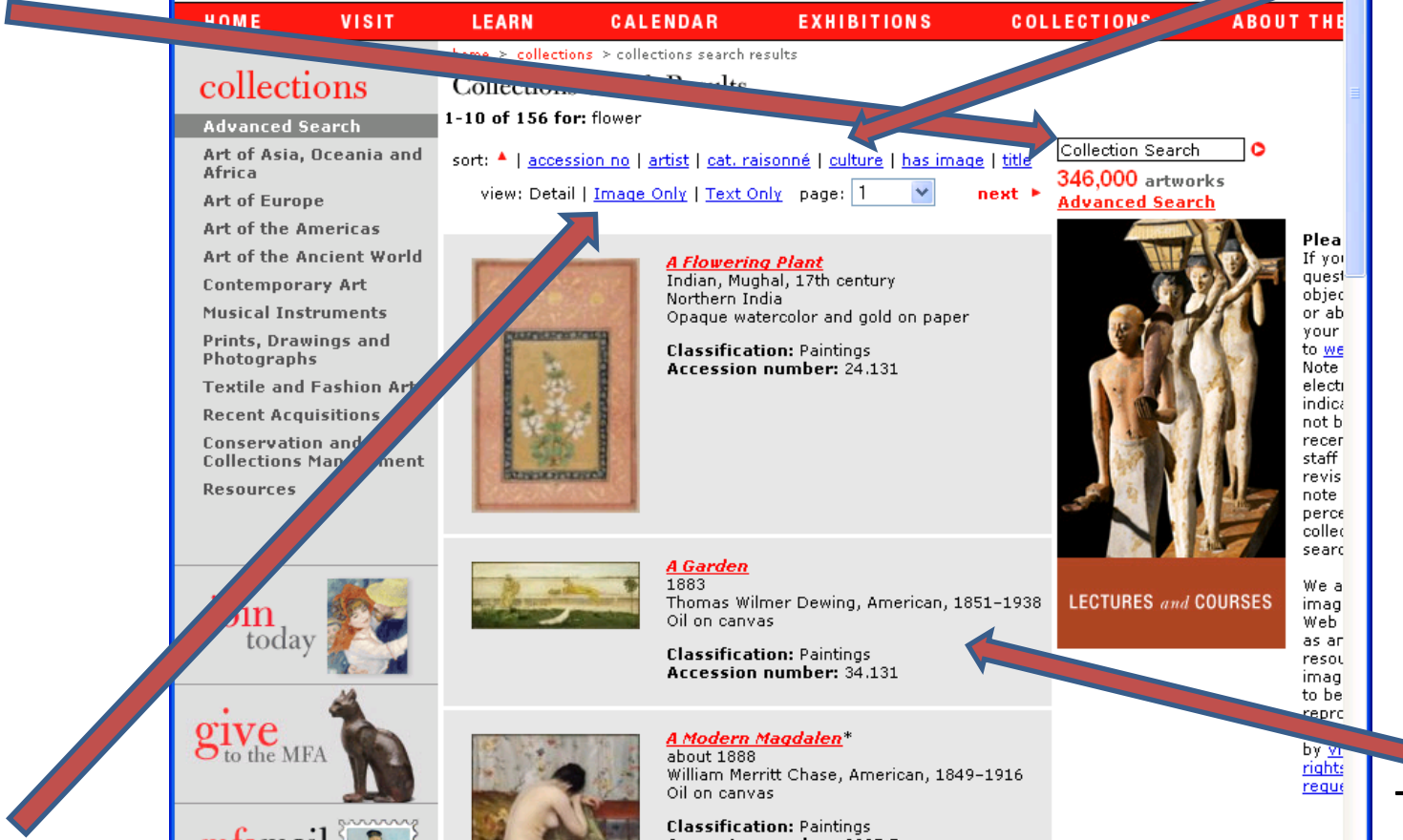
Faceted Browsing

Templated Items



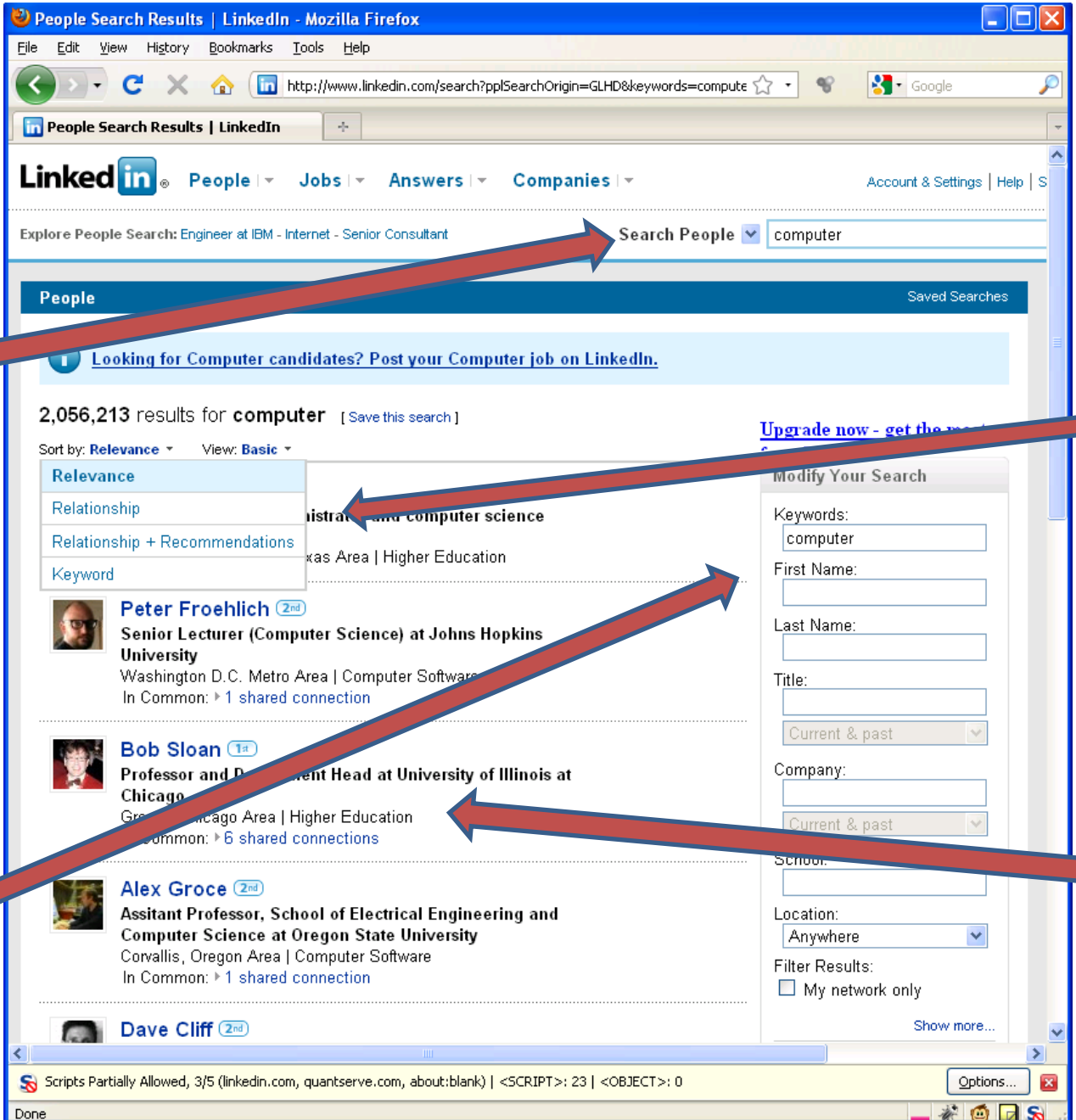
Sorting by Properties

Text search



Faceted Browsing

Templated Items



Text search

Sorting by Properties

Faceted Browsing

Templated Items

Impoverished Information Visualization?

- Is the sameness of all these pages a good thing?
- Most information presenters are not ambitious
- Carefully designed, domain- and task-specific information interactions will always be superior
- But powerful lowest common denominator
- People's experience of it makes it more powerful
 - Leverage expectations
 - No need to learn new site

Proof-of-concept implementation

EXHIBIT

Prototype: Exhibit

- A specific data/viz HTML vocabulary extension
 - And a Javascript library to interpret it
- Application independent
 - Fits any tool that takes HTML, e.g. HTML editor
- Pure client side
 - No need to design/admin server
- Freely interleave data with other HTML
 - Complete control of design
 - Integration with whatever other elements you like
- Static feels becomes interactive data visualization

Usage

- Deployed 2007
 - ~1900 exhibits on 800 domains
 - Millions of views
- Many data sets with no natural site on the web

EXAMPLES



Your Artists Albums

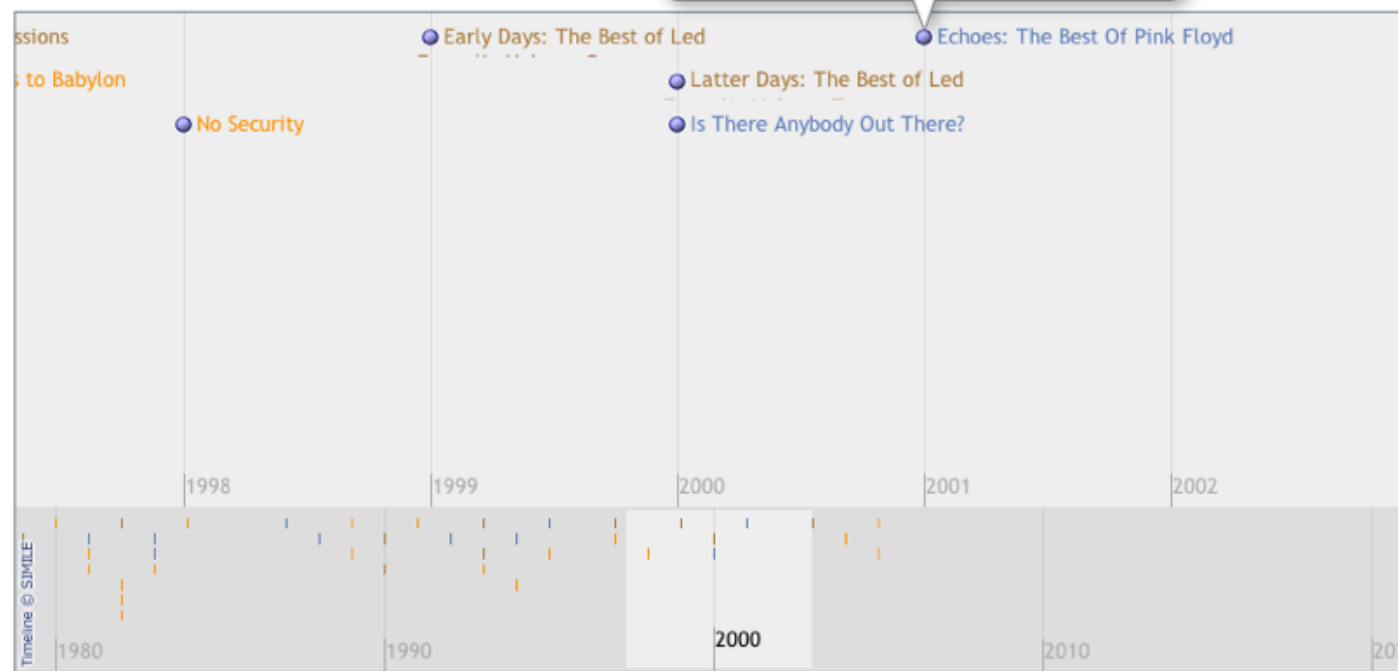
THUMBNAILS • LIST • RELEASE



Echoes: The Best Of Pink Floyd
Release: , 2001
Charts: (weeks)
[Buy Album](#)

Copy All

90 Items total



artist

- 18 ✓ Led Zeppelin
- 21 ✓ Pink Floyd
- 51 ✓ Rolling Stones

year

- 2 ✓ 1964
- 4 ✓ 1965
- 4 ✓ 1966
- 4 ✓ 1967
- 2 ✓ 1968
- 5 ✓ 1969
- 3 ✓ 1970
- 7 ✓ 1971

Re-Layout



Car

[BACK TO MYPIPELINE HOME](#)

Car Finder

This page aims to show a prototype of a Research A Car filtering engine. It uses MIT Simile Project's Exhibit JSON engine to filter results from an external javascript file, so it's not as robust as a database-driven site. But it's also quicker, and lightweight. :)

Here is the [Exhibit JSON data file](#).

CATEGORY	MANUFACTURER	RATING	PRICEBAND
38 Affordable Sports	4 Alfa Romeo	1 1	16 100,000-150,000
51 Exotic Sports	1 Ariel	1 1.5	21 15,000-30,000
	4 Aston Martin	4 2	33 30,000-70,000
	3 Audi	11 2.5	17 70,000-100,000
	1 Bentley Motors	15 3	
	10 BMW	12 3.5	
	1 Bristol	23 4	

[THUMBNAILS](#) • [TIMELINE](#)

89 Item total

[Copy All](#)

sorted by: [CATEGORY](#); then by... • grouped as sorted • show duplicates

Affordable Sports (38)



BMW 3 Series Coupe
Model Year: 1999-
4Car Rating: 3.5
Price Band: 15,000-30,000
[View Road Test](#)



Honda Civic Coupe
Model Year: 1996-2001
4Car Rating: 2
Price Band: 15,000-30,000
[View Road Test](#)



BMW 3-Series Coupe
Model Year: 2006-
4Car Rating: 4.5
Price Band: 30,000-70,000
[View Road Test](#)



Mitsubishi Lancer Evo IX
Model Year: 2005-
4Car Rating: 4
Price Band: 30,000-70,000
[View Road Test](#)



Primitivism: Rites of Spring

The information within this page has been retrieved from all over. Here is the [Exhibit JSON data file](#).

performance

- 61 ✓ Kirov reconstruction
- 3 ✓ Massine
- 7 ✓ World Premier

company

- 7 ✓ Ballet Russes
- 3 ✓ Massine
- 61 ✓ The Kirov Ballet

date

- 7 ✓ 1913
- 3 ✓ 1944
- 61 ✓ 1996

artist

- 58 ✓ Millicent Hodson
- 9 ✓ Nicholas Roerich
- 3 ✓ Sketch by Millicent Hodson ©
- 1 ✓ Unattributed

type

- 1 audio
- 5 company
- 71 ✓ costume
- 11 performance
- 4 photo
- 5 production
- 1 set

DETAILS • THUMBNAILS

71 costume filtered from 112 originally ([reset](#))

Copy All

sorted by: [performance](#); [then by...](#) • grouped as sorted • show duplicates

World Premier (7)



Women's Costume for the first



Hobby Stores

Firefox

ation... Datapress D... QuantNetw... (4) Facebook Data Interac... DATA Data.gov - ... DATA Data.gov - ... Global AFC ... EpiSPIDER A... Ocarina ... x

6 351-400	4 Polyphonic	1 A4-B5	1 Custom	8 Mountain Ocarinas
2 401-450		1 A4-C6	6 Gold	16 Noble Ocarina
2 451-500		7 A4-C7	2 Gray	3 North Country Workshop
1 601-650		1 A4-C8	36 Green	7 Ogawa
2 651-700		1 A4-F7	6 Hand Painted	19 Songbird Ocarina
1 701-750		5 A4-G7	5 Metallic	2 Spencer









Search

TABLE • PHOTO

172 OCARINA(S)

sorted by: retailer; then by... • grouped as sorted

6th Street Ocarina

 <p>6th Street 9 Hole Soprano \$42 F5-A6 Buy: USA</p>	 <p>6th Street 10 Hole Soprano \$44 F5-Bb6 Buy: USA</p>	 <p>6th Street 10 Hole Alto \$54 C5-F6 Buy: USA</p>	 <p>6th Street 9 Hole Zelda \$56 C5-E6 Buy: USA</p>
 <p>6th Street 10 Hole Zelda \$59</p>	 <p>6th Street 12 Hole Alto \$59</p>	 <p>6th Street 9 Hole Tenor \$66</p>	 <p>6th Street 12 Hole Zelda \$68</p>

Science

Firefox

substrate.burnham.org/protein/annotation/789/html

PMAP SubstrateDB

Collagen alpha-1(I) chain

Identifiers | Names | Organism | Sequence | Help

UniProt: [P02452](#), UniProt ID: [CO1A1_HUMAN](#)

24 items

4 results out of 24 cannot be plotted.

sorted by: [labels](#); then by... • grouped as sorted

1. COLFI@1245
InterPro Domain: [Fibrillar collagen, C-terminal](#)
Seq range: 1245 - 1463
2. Collagen@1019
InterPro Domain: [Collagen triple helix repeat](#)
Seq range: 1019 - 1078
3. Collagen@1079

Search this Protein

Select Annotation

- CutDB cut site (4)
- domain (20)

Select MEROPS Protease Clan

- (missing this field) (21)
- Metallo (1)
- Serine (2)

Select MEROPS Family

- 21 (missing this field)
- 1 M06
- 1 S01
- 1 S09

Select Protease

- 20 (missing this field)
- 1 fibroblast activation protein alpha subunit
- 1 inhA g.p.
- 1 kallikrein hK13
- 1 neutral protease Npr599

Select Domain

- 4 (missing this field)

PhD Theses


Kansai Chapter 6

http://llarc.mit.edu/kansai/ch6/


[Interview Questions \(Spreadsheet\)](#) [Clips \(Spreadsheet\)](#) [Interviewees \(Spreadsheet\)](#)

120 Clip, Interviewee, and Question total.

sorted by: [QuestionID](#); then by... • grouped as sorted

1. 

01. 何才か (How old are you?)	
Difficulty:	1
Degree of Kansai-ben	1
Interviewee	タカシ (Takashi)(M) under 10 Nephew Student Shiga

2. 

01. 何才か (How old are you?)	
Difficulty:	1
Degree of Kansai-ben	2
Interviewee	アキラ (Akira)(M) 30s-3.late Brother Architect and Teacher Shiga and Osaka

Type

- 46 ✓ Clip
- 36 ✓ Interviewee
- 38 ✓ Question

Interview Question

- 16 ✓ 01. 何才か (How old are you?)
- 3 ✓ 02. 学校が好きか (Do you like school?)
- 2 ✓ 03. 好きな/嫌いな科目は何か (What is your favorite / least favorite subject?)
- 3 ✓ 04. 担任の先生は誰か (Who is the teacher in charge of your class?)

Interviewee Name

- 9 ✓ サヤサ (Sayasa)
- 3 ✓ アキラ (Akira)
- 8 ✓ アユミ (Ayumi)
- 1 ✓ タカヤマさん (Takayama-san)
- 1 ✓ ウチダさん (Uchida-san)
- 1 ✓ ハセガワさん (Hasegawa-san)
- 1 ✓ マツダさん (Matsuda-san)

Interviewee Gender

- 22 ✓ F
- 24 ✓ M

Interviewee Age

- 9 ✓ 10s-1.early
- 1 ✓ 20s-2.mid
- 3 ✓ 20s-3.late
- 5 ✓ 30s-1.early
- 5 ✓ 30s-3.late

Done

Rental Apartments

Double/twin rooms near Boogie-Bären, Landsberg am Lech, Germany, May 25-28 2007 [select Distance / Price view]

Back Forward Reload Stop Home <http://exhibit.ecmanaut.googlepages.com/boogie.dev.html> Google Bookmarks

Double/twin rooms near Boogie-Bären, Landsberg am Lech, Germany, May 25-28 2007

TABLE • DISTANCE / PRICE • MAP

243 Items total.

[146 results](#) out of 243 cannot be plotted.

Price (SEK)

Distance (km)

Available double rooms

- 16 ✓ false
- 95 ✓ true

Distance (km)

Price (in SEK)

- 1 ✓ 0 - 500
- 2 ✓ 1000 - 1500
- 13 ✓ 1500 - 2000
- 19 ✓ 2000 - 2500
- 22 ✓ 2500 - 3000
- 18 ✓ 3000 - 3500
- 8 ✓ 3500 - 4000
- 4 ✓ 4000 - 4500
- 2 ✓ 4500 - 5000
- 2 ✓ 5000 - 5500

Photo: [Rory Turnbull](#)

Waiting for flickr.com... ✖ 1 Error

Data.gov

Firefox

www.data.gov/semantic/Castnet/html/exhibit

An Official Web Site of the United States Government

Sunday, October 23, 2011 Text: A+ A- A Share

DATA.GOV
EMPOWERING PEOPLE

Search our catalogs.. SEARCH

HOME DATA APPS COMMUNITY METRICS OPEN DATA SITES GALLERY WHAT'S NEW

Clean Air Status and Trends Network (CASTNET)

Land Use

- 27 Agric
- 1 Coastal/Marsh
- 3 Desert
- 40 Forest

Terrain

- 37 Rolling
- 4 Mountaintop
- 1 Flat/Water
- 14 Flat

Agency

- 59 EPA
- 25 NPS

84 Items

Map Satellite Hybrid



NGOs

The screenshot shows a Firefox browser window with several tabs open. The active tab is 'www.srji.org/en/legal/cases'. The website header includes a language selector (RU/EN) and the name 'Russian Justice Initiative'. A left sidebar contains navigation links: 'About us', 'News', 'Legal work', 'Cases', 'Security', 'Impact', 'Chechnya', 'ECHR', and 'Resource Center'. Below this is a 'QUICKLINKS' section with links for 'Make a donation', 'Summary of cases', 'E-mail newsletters', 'Add headlines to your site', and 'RSS Feed'. An 'E-MAIL NEWSLETTERS' section features an email input field and a 'Join' button. The main content area is titled 'ECHR Cases from the North Caucasus' and includes a breadcrumb trail: 'SRJI > Legal work > ECHR Cases from the North Caucasus'. A sub-header reads 'ECHR Cases from the North Caucasus'. Below this, a paragraph states: 'This page contains select cases from the North Caucasus that are pending before the European Court of Human Rights. The list is not complete.' There are 241 cases listed, with options for 'SUMMARIES' and 'TIMELINE'. A sorting option is shown: 'sorted by: status; then by... • [checked] grouped as sorted'. A section titled '.Decided (169)' features a case entry for 'Shokkarov and Others v. Russia, (41009/04)'. The case details include: Judgment: 2011-05-03, Communicated: 2008-01-10, Lodged: 2004-11-19, Date of violation: 2003-01-06, Violation: Disappearance and Extra-judicial execution, Location: Ingushetia, and Representative: International Protection Centre. A detailed description follows: 'Early in the morning on 6 January 2003 a group of policemen arrested Visadi Shokkarov in the Satsita camp located in the Sunzhenskiy District, Ingushetia. Later the same day his family went to the department of the interior (the ROVD) to ask for him. There two men in civilian clothes approached Visadi's brother Visita Shokkarov and led him through the gates of the ROVD. Visita has been missing since. Visadi was charged with murder and his arrest prolonged. According to the authorities, Visadi died in a car crash on 2 February 2003. His body had been burned and carbonised'. On the right side, there are two informational boxes. The top one explains that categories can be used to limit selection and that a timeline shows cases by date of violation. The bottom one provides information about projects submitting cases from the North Caucasus, listing 'Stichting Russian Justice Initiative', 'European Human Rights Advocacy Center', and 'the Human Rights Centre Memorial'.

Firefox

ECHR Ca... x HCLS Brain ... Global AFC ... Ch6. Intervi... MutDB Gen... Chembank ... Castnet Ozo... PMAP: Subs... Florida's do... Fore > + -

www.srji.org/en/legal/cases

RU Правовая инициатива по России

EN **Russian Justice Initiative**

About us

News

Legal work

Cases

Security

Impact

Chechnya

ECHR

Resource Center

QUICKLINKS

Make a donation

Summary of cases

E-mail newsletters

Add headlines to your site

RSS Feed

E-MAIL NEWSLETTERS

email

Visit this group

SRJI > Legal work > ECHR Cases from the North Caucasus

ECHR Cases from the North Caucasus

This page contains select cases from the North Caucasus that are pending before the European Court of Human Rights. The list is not complete.

241 Cases

SUMMARIES • TIMELINE

sorted by: status; then by... • grouped as sorted

.Decided (169)

Shokkarov and Others v. Russia, (41009/04)

Judgment: 2011-05-03
Communicated: 2008-01-10
Lodged: 2004-11-19
Date of violation: 2003-01-06
Violation: Disappearance and Extra-judicial execution
Location: Ingushetia
Representative: International Protection Centre

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Use the categories below to limit the selection. The timeline shows cases according to date of violation.

text search:

For more information about projects submitting cases from the North Caucasus, see: [Stichting Russian Justice Initiative](#), [European Human Rights Advocacy Center](#), and the [Human Rights Centre Memorial](#).

Newspapers

Firefox

www2.startribune.com/projects/maps/bridges/bridges.html

YOUR GUIDE TO THE TWIN CITIES • Sign In Register Help ▾ Subscriber Services ▾ Buy Ads ▾ Store ▾

Site Index Search the Star Tribune

StarTribune

Tuesday May 10, 2011

READY TO SAVE?
\$79 for \$185 Worth of Housecleaning from CottageCare

News Local Sports Business Politics Opinion Lifestyle Entertainment Classifieds Autos Housing Jobs Shopping Weekly Ad

Local | Nation | World | Investigators | Weather | Obituaries

infoCenter

Bridge watch: Rating Minnesota's bridges

More than 300 Minnesota bridges receive special scrutiny because of structural deficiencies, outdated design features that make them functionally obsolete or use of gusset plate connectors similar to those on the Interstate 35W bridge that collapsed. Not all of these bridges rank low on the federal government's 100-point rating scale, however. Generally, a rating below 80 means the bridge needs some rehabilitation, while those of 50 or less may need to be replaced. The map includes main highway bridges and about 35 local bridges that use gusset plates. The data is from the most recently available National Bridge Inventory database and from Minnesota Department of Transportation reports.

Filter map by ...

Status

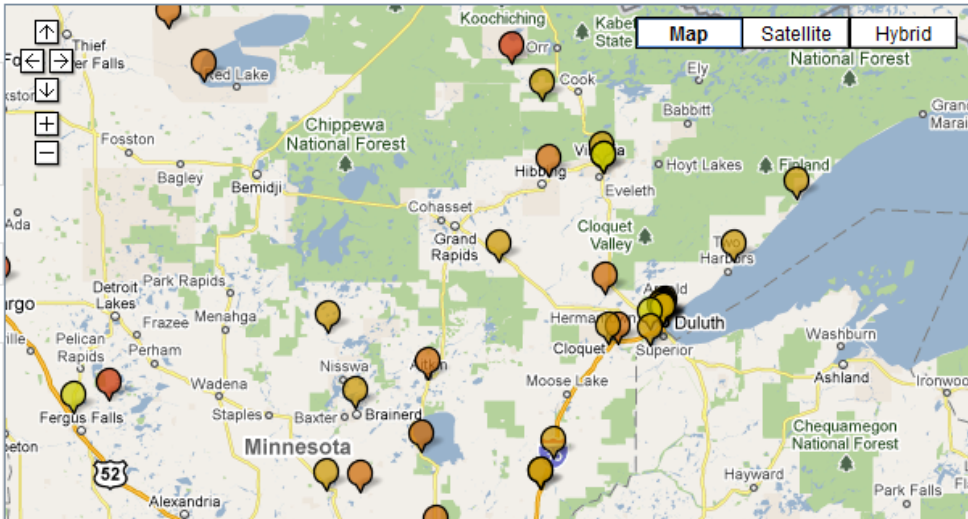
- 191 Functionally Obsolete
- 19 Not Deficient
- 106 Structurally Deficient

Special gusset plate inspection

- 57 On inspection list

Rating (out of 100)

- 6 0 - 20
- 25 20 - 40
- 61 40 - 60
- 153 60 - 80
- 71 80 - 100



Map Satellite Hybrid

Minnesota

Libraries

Firefox

SIMILE Wid... SIMILE Wid... David Franç... Veggie Guid... Music Com... Breweries a... Broadway S... This Beautif... Electroni... x Den > + -

library.law.columbia.edu/eresources/index.html

Columbia University > Law School Library | Pegasus

Arthur W. Diamond Law Library Electronic Resources

Law

[Selden Society Publications and the History of Early English Law](#) -- *Librarian Assistance Required*

US Legal Databases

[Bloomberg](#) -- *Students must have authentication device or use public terminals located on 2nd and 4th floors. See the Reference Desk for assistance.*
Access at dedicated terminals on site or by personal account. Contains a wide variety of legal and financial information, including court dockets and transactional news.

[BNA's Core Plus with Tax Management](#) (TITLE LIST)

[CALI Lessons](#) -- *Librarian assistance required.*

[Environmental Law Reporter](#) -- *If this link does not load, click the refresh button in your web browser.*

[Fastcase](#) -- *Librarian assistance required.*
Online 50-state and federal case law database.

[Hedge Fund Law Report](#)

[HeinOnline](#)

[HeinOnline American Law Institute Library](#)

[HeinOnline Law Journal Library](#) (TITLE LIST)
Full text image-based searchable database of legal periodicals.

[HeinOnline Legal Classics Library](#)
The HeinOnline Legal Classics Library offers more than 1,200 works from some of the greatest legal minds in history, including Joseph Story, Louis Brandeis, Benjamin N. Cardozo and Edwardo Coke. In addition to many "classics", this collection includes rare items that are found in only a handful of libraries around the world. The collection focuses on constitutional law, political science, and other classic topics.

[HeinOnline Session Laws](#)

[HeinOnline Subject Compilations of State Laws](#)
This database contains references to more than 18,000 sources of 50-state surveys including law review articles,

Select by Type

- 34 US Legal Databases
- 6 Periodical and Treatise Indexes
- 26 Foreign Law Databases
- 23 International Law Databases
- 1 Law

Search the list

Sports

Firefox

SIMILE Wid... SIMILE Wid... David Franç... Veggie Guid... Music Com... Breweries a... G Broadway S... This Bea... x Electronic R... Den > + -

www.thisbeautifulgame.com/live/pages/Home.php

Select Language

Powered by Google™ Translate





















Tournaments Players Movies Books About

Confederation Tournament

Year 1930 - 2020

Timeline Winner Map Host Map Grid Summary

Select one or more tournaments with Ctrl-Click. Selected tournaments have a dark outline.

Tournament	Host:Name	:Flag	Year	Winner:Name	:Flag	Result	Runners Up:Name	:Flag
 FIFA World Cup	Uruguay		1930	Uruguay		4-2	Argentina	
 FIFA World Cup	Italy		1934	Italy		2-1 aet	Czech Republic, as Czechoslovak Republic	
 FIFA World Cup	France		1938	Italy		4-2	Hungary	
 FIFA World Cup	Brazil		1950	Uruguay		Final Round Standings	Brazil	
 FIFA World Cup	Switzerland		1954	Germany, as West Germany		3-2	Hungary	

Strange Hobbyists

Firefox

SIMILE Wid... SIMILE Wid... David Franç... Veggie Guid... Music Com... Brewerie... × Broadway S... This Beautif... Electronic R... Den

shawnday.com/drink.html

Breweries and Distilleries in Ontario 1914-15

[TILES](#) • [MAP](#)

55 Brewery and Distillery total [Copy All](#)

sorted by: [Company](#) and [type](#); then by... • grouped as sorted • [show duplicates](#)

- Alfred J. Wright**
Brewery, Orillia, Ontario, Canada
- Barrie Malting**
Brewery, Barrie, Ontario, Canada
- Berlin Lion Brewery**
Brewery, Kitchener, Ontario, Canada
- Biswell Brewing**
Brewery, Brantford, Ontario, Canada
- Bowie & Co**
Brewery, Brockville, Ontario, Canada
- Brading Brewing**
Brewery, Ottawa, Ontario, Canada

Location

- 1 ✓ Barrie
- 2 ✓ Belleville
- 1 ✓ Berlin
- 1 ✓ Brantford
- 1 ✓ Brockville
- 1 ✓ Carlsruhe
- 1 ✓ Cornwall

type

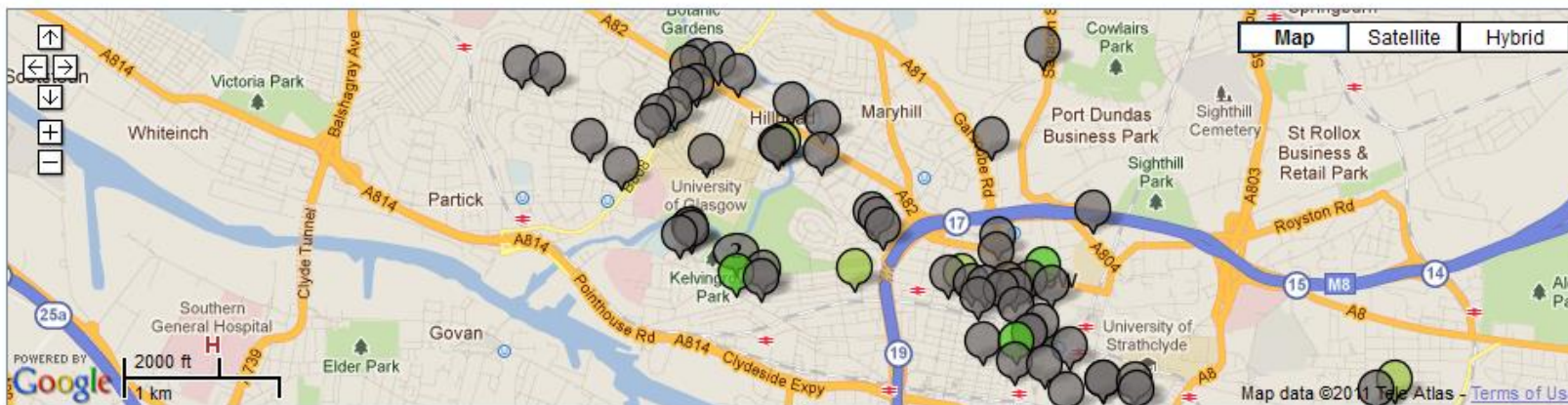
- 46 ✓ Brewery
- 9 ✓ Distillery



Veggie Guide to Glasgow

[glasgow vegan network](#)
[edinburgh vegan network](#)
[edinburgh vegan guide](#)
[vegan scotland on flickr](#)
[planet vegan scotland](#)
[vegan villages uk](#)

3 results out of 107 cannot be plotted.



Omni
 Vegan
 Vegetarian

107 Items filtered from 125 originally ([Reset All Filters](#))

sorted by: [foodOrdered](#) and [label](#); then by... • grouped as sorted

1. Vegan (6)



Drimlabarra Herb Farm [WebSite](#)

Retreat, Vegan

Veganic farm offering workshops, courses and volunteering. Campsite and caravan accommodation

Up a track (zoom out map to find) Isle of Arran

01770 820 338

1.

Quick Search:

Food

92 [Omni](#)
 6 [Vegan](#)
 9 [Vegetarian](#)

Type

1 [Bakery](#)
 8 [Bar](#)
 5 [Bed & Breakfast](#)
 12 [Cafe](#)
 1 [Catering](#)
 2 [Chinese Restaurant](#)

Usage Study

- Deployed 2007
 - ~1900 exhibits on 800 domains
 - Millions of views
- Many data sets with no natural site on the web
- By fetching and analyzing these, we can ask
 - What kind of data do people want to publish?
 - And how do they want to publish it?
 - (subject to limitations imposed by Exhibit)

Domains

- **Source:** 50 of the top trafficked Exhibits in our dataset.

Schools/Universities	40%
Personal/Hobby	25%
Organization	19%
News	6%
Commercial	4%
Library	4%
Conference	2%

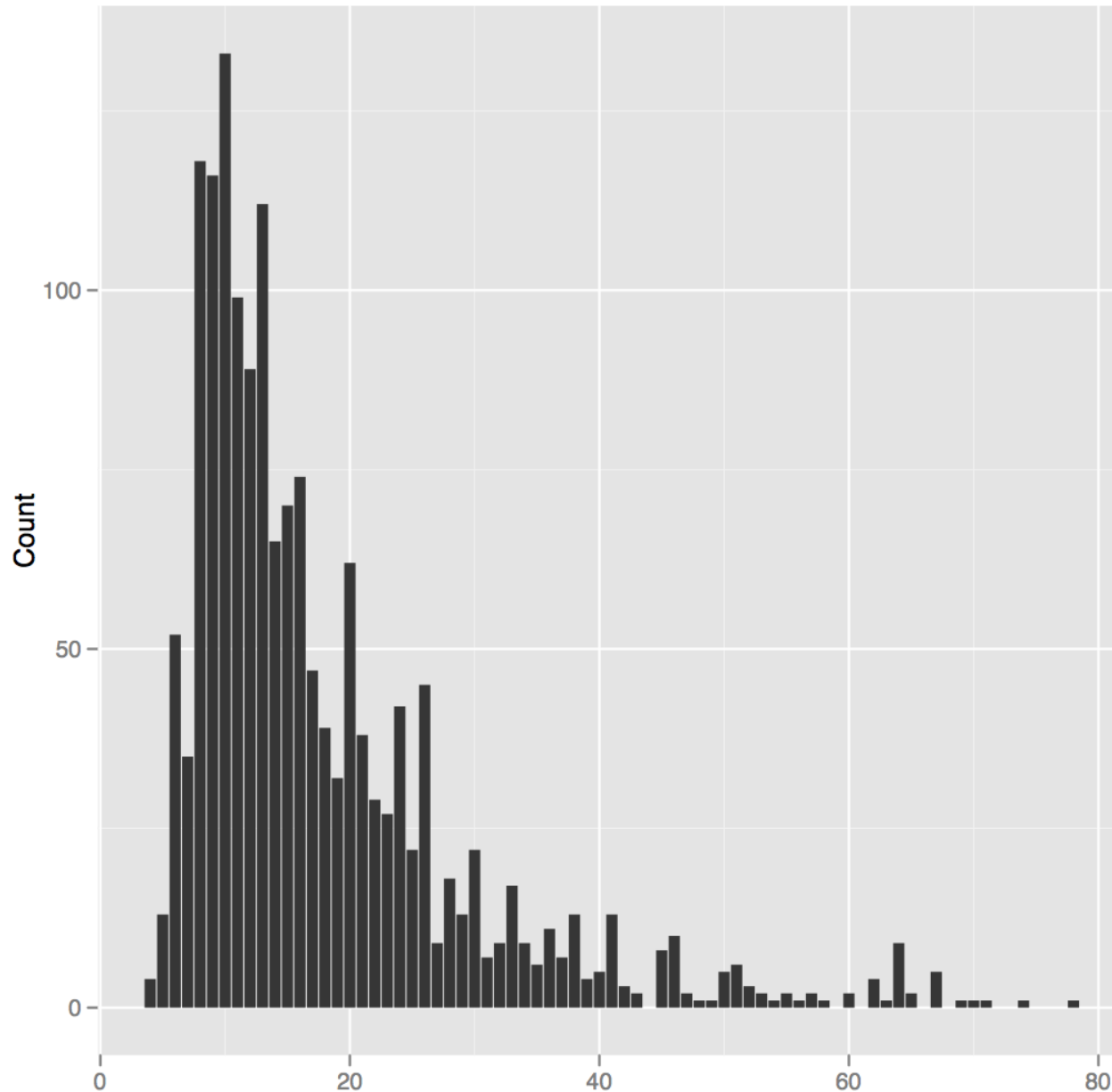
Data Model

Graph	27%
Multi-valued Table	32%
Table	41%



Cyclic	22%
Acyclic	78%

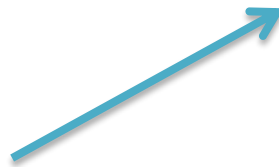
Schema Size (Number of Properties)



Data Format

- Some exhibits use multiple formats, so sum > 100%

Hmm....

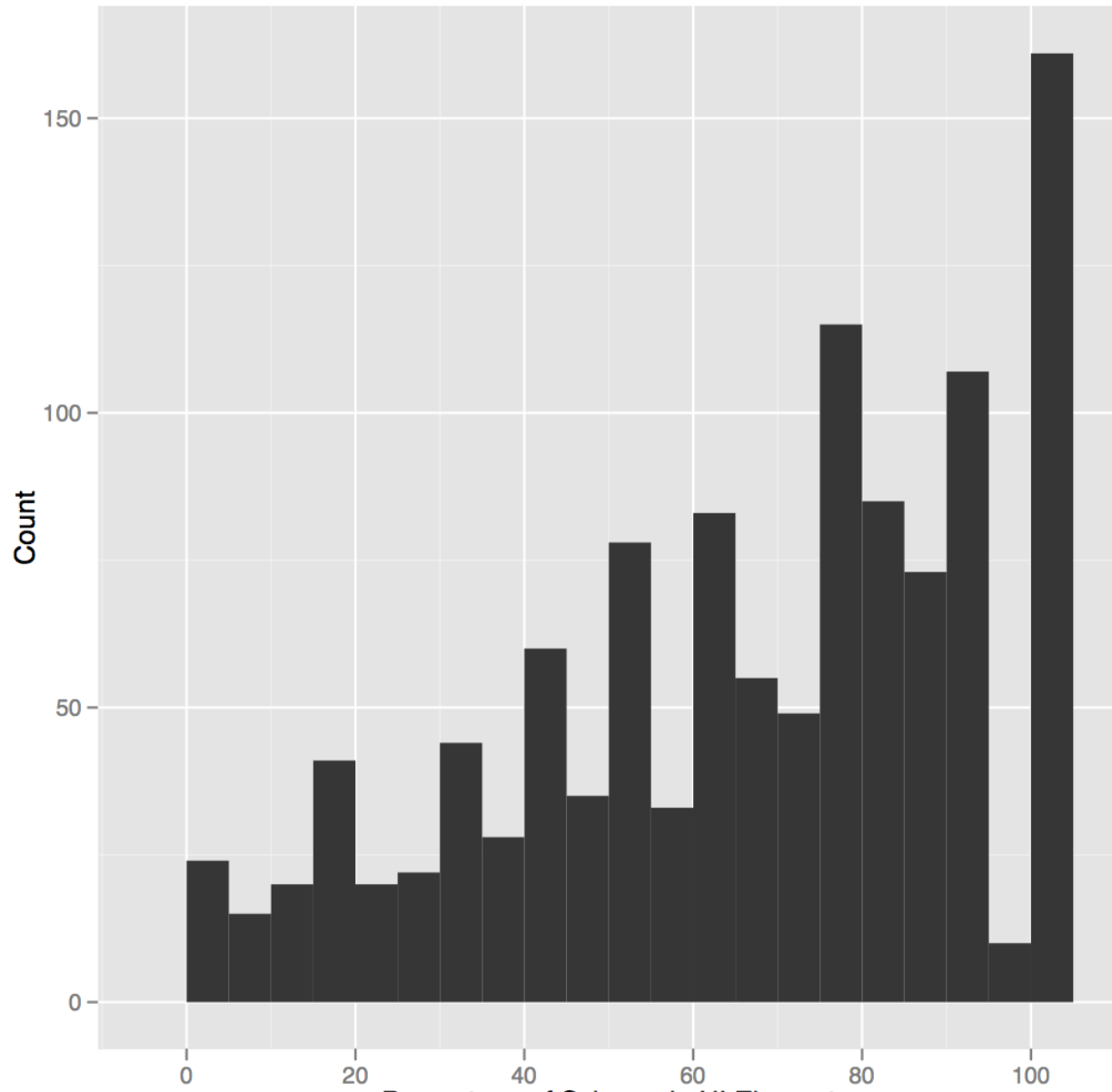


JSON	69%
Google Spreadsheet	32%
Bibtex	2%
RDF	1%
Excel	0.1%
CSV	0.06%
Freebase	0.06%

Single-View Exhibits

Text-Only (list, table, title)	59%
Timeline	19%
Map	14%
Chart	8%

Percentage of Schema in Visualization



Authoring by Copying

- HTML describes visualization
- Copy it, change the data
- (Maybe change the presentation too)

MIT Nobel Prize Winners

234 Dog total

Copy All

name	ragom ID	photo	date	high medical
Zoey	07-147		01-25	no
Zoe	07-078		2002-02-21	no
Zeta	07-077		2005-09-14	no
Xena	07-098		2000-03-09	no

adopted
145 ✓ no
89 ✓ yes

high_medical
234 ✓ no

EXHIBIT

Done

Scalability

- Javascript slow, not designed to implement DBs
- Fast for < 1000 items
- Some people have used 25000 items or more
- Not a limitation per se
- Plenty of small data sets
- Wranger [Heer et al] can handle 1M items

Incentivizing Data

- A data-centric web page is better
 - More effective communication
 - Easier to maintain (like CSS)
 - Creates enthusiasm for working with data
- Data is exposed as a side effect
 - Enabling reuse
 - Alternative visualizations
 - Critiques
- Selfish incentives lead to global benefit

DATA EXPORT

David Karger's Publications

This publication page was created using our [Exhibit](#) tool; if you have a bibtex file you can make one just like it simply by copying a couple of files onto your web server directory. Instructions [here](#)

Text Search

TILES • TIMELINE

162 Publications

Filter by category

- Applications of Theory (20)
- CHI (19)
- Coding (17)
- Cuts and Flows (35)
- Haystack (23)
- Information Retrieval (42)
- Machine Learning (9)
- Mechanism Design (3)
- P2P (20)
- Scheduling (2)
- Semantic Web (25)
- Systems (19)
- Theory (99)

sorted by: [year](#); [then by...](#) • grouped as sorted

2008 (1)

1. **Improved Distance Sensitivity Oracles via Random Sampling**
Bernstein, Aaron and Karger, David
Proceedings of the 19th Annual ACM-SLAM Symposium on Discrete Algorithms, January 2008 (pp. 34-43) [pdf](#)

2007 (12)

1. **It's All the Same to Me: Data Unification in Personal Information Management**
Karger, David R.
in William Jones and Jaime Teevan, editors, *Personal Information Management*, 2007 (pp. 127-152) [Click for abstract:](#) [pdf](#)
2. **Haystack: Per-User Information Environments**
Karger, David R.
in Victor Kaptelinin and Mary Czerwinski, editors, *Beyond the Desktop Metaphor: Designing Integrated Digital Work Environments*, 2007 (pp. 49-100) [Click for abstract:](#) [pdf](#)
3. **Management of personal information scraps**
Bernstein, Michael S., Kleek, Max Van, schraefel, m. c., and Karger, David R.
CHI Extended Abstracts, May 2007 (pp. 2285-2290) Poster. [Click for abstract:](#) [pdf](#)

by publication type

- Conference Publication (114)
- In a Book/Collection (5)
- Journal Article (39)
- Manuscript (2)
- PhD Thesis (1)
- Technical Report (1)

by co-author

- 1 Ackerman, Mark S.
- 1 Adar, Eytan
- 1 Afrati, Foto
- 1 Ahmed, Ebad
- 1 Alpert, C. J.
- 1 Alvarado, Christine

Year

1991 1992 1993 1994
1995 1996 1997
1998 1999 2000
2001 2002 2003
2004 2005 2006
2007 2008

Conference

- AAAI ALENEX Allerton
- CHI CIDR CIKM CISS
- DIMACS EC ESA FOCS
- HotNets HotOS ICAPS
- ICML INTERACT IPTPS
- ISIT ISWC IUI Mobicom
- NAACL NSDI OOPSLA
- Oxygen Pervasive PLDI
- PODC SDR SIGCOMM
- SIGIR SIGMOD
- SODA SOSP SPAA
- STOC SWAT SWFAT
- SWUI UIST USENIX
- Security VLHCC WADS
- WINE WWW

Journal

- 1 IEEE Transactions on Information Theory
- 1 (IEEE) Transactions on Networking

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TILES • TIMELINE

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1991 1992 1993 1994
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2007 2008

[RDF/XML](#)

[Semantic wikitext](#)

[Tab Separated Values](#)

[Exhibit JSON](#)

[Generated HTML of this view](#)

sorted by: [year](#); [then by...](#) • grouped as sorted

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4. {U-REST}: an unsupervised record extraction system

Shen, Yuan Kui and Karger, David R.

Filter by category

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[Haystack](#) (23)

[Information Retrieval](#) (42)

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[Semantic Web](#) (25)

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1 [Alpert, C. J.](#)

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Conference

AAAI ALENEX Allerton
CHI CIDR CIKM CISS
DIMACS EC ESA FOCS
HotNets HotOS ICAPS
ICML INTERACT IPTPS
ISIT ISWC IUI Mobicom
NAACL NSDI OOPSLA
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STOC SWAT SWFAT
SWUI UIST USENIX
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 - 1 Alvarado, Christine

162

2008

1

2007

1

Copy this code to your clipboard as you would copy any text. Press ESC to close this dialog box. Close

```
(
  "items": [
    {
      "id": "It's All the Same to Me: Data Unification in Persona",
      "label": "It's All the Same to Me: Data Unification in Pers",
      "type": "Publication",
      "uri": "http://simile.mit.edu/cc/exhibit-builder/urn:8b3503",
      "abstract": "Information fragmentation is a pervasive probl",
      "pages": "127-152",
      "author": "Karger, David R.",
      "editor": "William Jones and Jaime Teevan",
      "publisher": "University of Washington Press",
      "cat": ["Information Retrieval", "Semantic Web"],
      "chapter": "8",
      "key": "Karger: PimBook",
      "year": "2007",
    }
  ]
)
```

[Click for abstract.](#)

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 - 2007 2008

- Conference
- AAAI ALENEX Allerton
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 - STOC SWAT SWFAT
 - SWUI UIST USENIX
 - Security VLHCC WADS
 - WINE WWW

- Journal
- 1 IEEE Transactions on Information Theory
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Summary

- Anyone who can write HTML can write a data-interactive web page
 - Sorting, filtering, searching
 - Lists, Maps, Timelines, Plots
 - Item templates
- Post it on the web and it works
- Data is explicit, can be extracted for reuse
- The visualization is the incentive

What if you can't write HTML?

EXTENSIONS

Wibit

Collaborative Authoring in a Wiki

- Exhibit is html file
- Put it in a wiki
- Combine data interaction and collaboration





The screenshot shows a web browser window displaying the Wibit Wiki page for "Beers". The page is titled "Beers" and has a navigation bar with options like "page", "discussion", "edit", "history", "delete", "move", "protect", "watch", and "refresh". The main content area is titled "Beers" and has a sub-header "TILES • TABLE • MAP". Below this, there is a search bar and a list of beers. The list is sorted by "Brewed in country and beer_type; then by..." and is grouped as sorted. The list shows two categories: "Brazil (1)" and "Germany (17)".

Brazil (1)

1. **Brahma**

Brewed by: [Antarctica](#)
City: São Paulo
Country [Brazil](#)
Beer Type

Germany (17)

1. **Diebels Alt**

Brewed by: [Brauerei Diebels](#)
City: Issum
Country [Germany](#)
Beer Type
2. **Hoepfner Pilsner**

Brewed by: [Hoepfner](#)
City: Karlsruhe
Country [Germany](#)
Beer Type

On the right side of the page, there is a search bar and a list of countries with checkboxes. The list is titled "Brewed in Country" and has a "2" next to it. The countries listed are: Australia, Belgium, Brazil, Canada, China, Cyprus, Germany, Greece, Indonesia, Ireland, Israel, Japan, Kenya, Mexico, Netherlands, New Zealand, Poland, Rwanda, South Africa, Spain, Switzerland, Tanzania, and Uganda. The "Brazil" and "Germany" checkboxes are checked.

At the bottom of the browser window, there is a search bar with the text "Find: kane" and navigation buttons for "Next", "Previous", "Highlight all", "Match case", and "Phrase not found".

Exhibit in a Wiki: Wibit

- Wikitext to describe Exhibit

Editing Beers - Wibit Wiki - Mozilla Firefox

File Edit View History Bookmarks ScrapBook Tools Help

http://projects.csail.mit.edu/wibit/wiki/index.php?title=Beers&action=edit

David Karger my talk my preferences my watchlist my contributions log out

page discussion edit history delete move protect watch refresh

Editing Beers

B / **Ab** **A** **√** **W** **—**

```
{{#ask: [[Category:Beer]]
| ?brewed by
| ?beer type=Beer
| ?brewed in city
| ?brewed in state
| ?brewed in country
| ?Image URL
| ?Brewed Coordinate
| format=exhibit
| views=tiles,tabular, map
| facets=search,Brewed in Country,brewed by
| limit=100
| mainlabel=Beer Name
| height=600px
| sort=brewed in country,Beer Type
| lens=beer2
}}
```

```
[[Category:Exhibit]]
[[Description::Beers of the World]]
```

Find: kane Next Previous Highlight all Match case Phrase not found

Exhibit in a Blog: Datapress

- Wordpress plugin
- Link to data source
- Then WYSIWIG your visualization

Presidents (Map and Lens) @ Datapress Demo - Mozilla Firefox

File Edit View History Bookmarks Tools Help

AAA12007 - ... Editing AAA... Beers of the... Conference... Collection:C... Collection:B... Datapress D... Datapress D... Presid...

Datapress Demo

Does having a tree background make our site Carbon Neutral?

< Retirement Cities >

Search

Presidents (Map and Lens)

This entry was posted Tuesday, 31 March, 2009 at 9:58 am [edit post]

42 Presidents

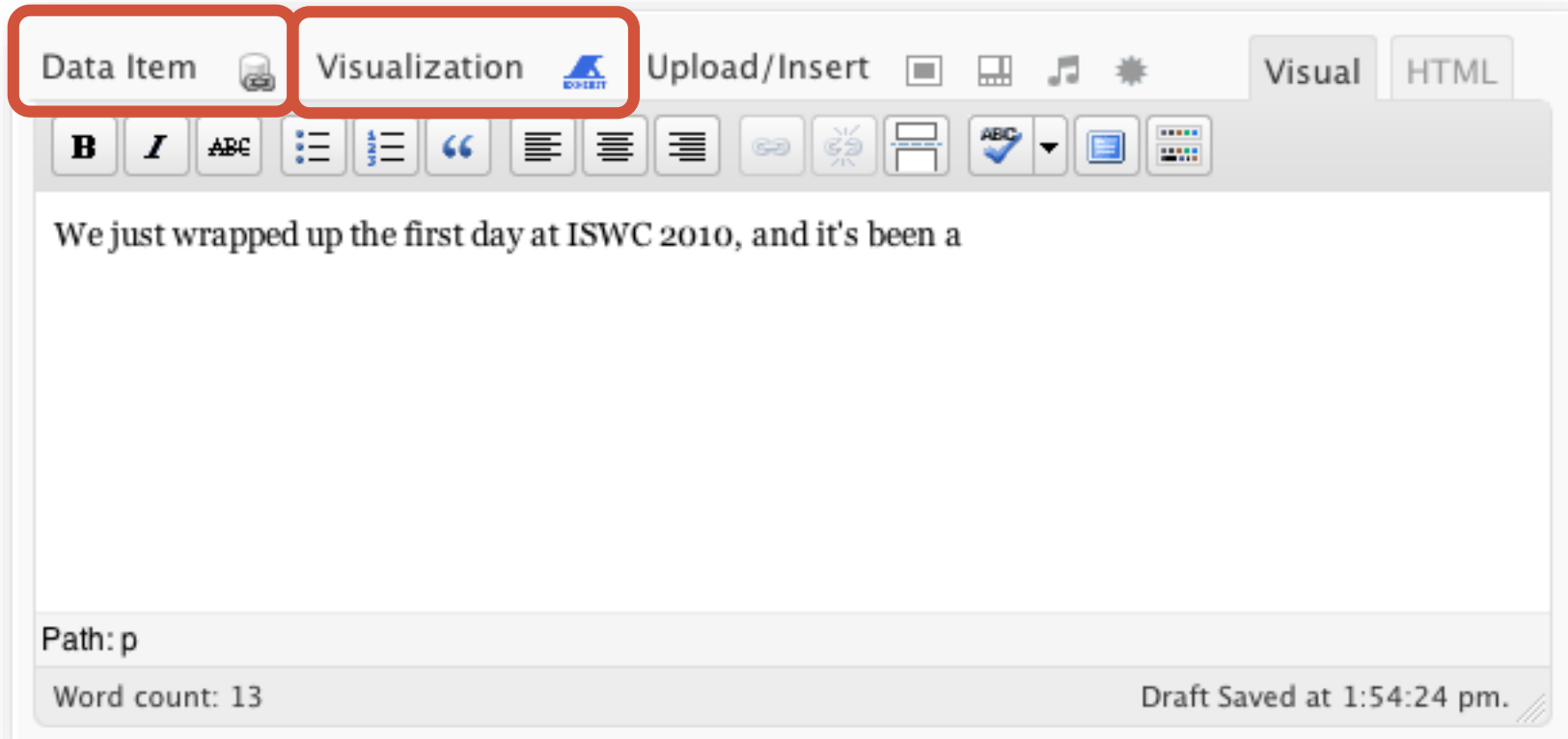
Map Satellite Hybrid

M	T	W	T	F	S
1	2	3	4	5	6
8	9	10	11	12	13
15	16	17	18	19	20
22	23	24	25	26	27
29	30				

< Apr

[→ Home](#)
[→ About](#)
[→ Haystack Publications](#)

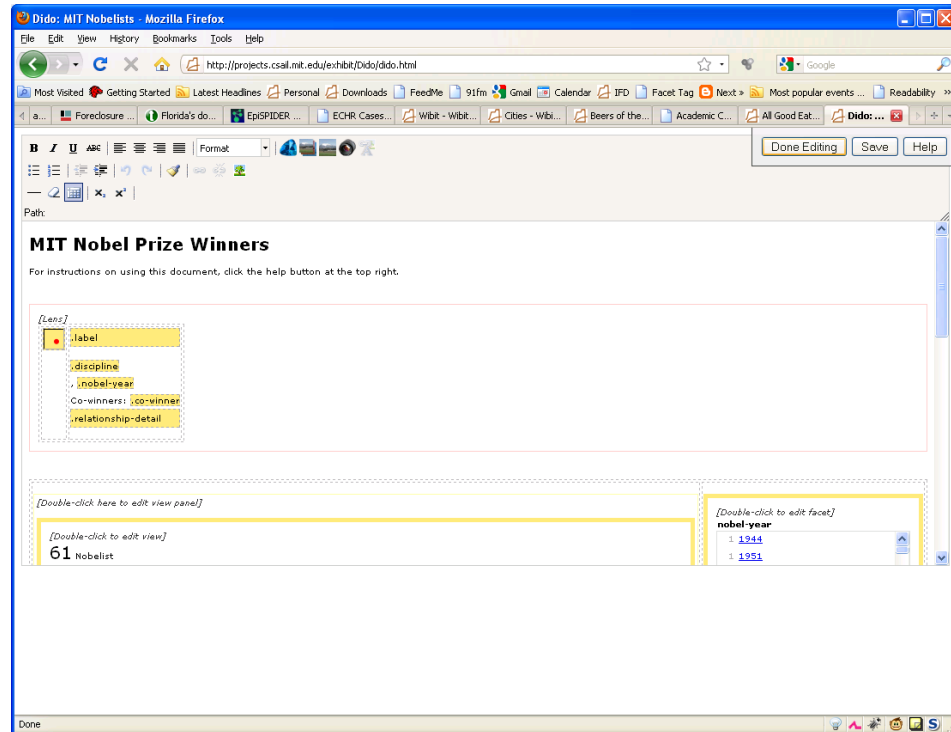
WordPress + datapress



The image shows a screenshot of the WordPress editor interface. The top toolbar contains several tabs: "Data Item" (with a document icon), "Visualization" (with a blue logo), "Upload/Insert" (with icons for image, video, audio, and link), "Visual", and "HTML". The "Data Item" and "Visualization" tabs are highlighted with a red border. Below the tabs is a rich text editor toolbar with icons for bold, italic, text color, bulleted list, numbered list, quote, indent, outdent, link, unlink, print, link checker, and a dropdown menu. The main text area contains the text: "We just wrapped up the first day at ISWC 2010, and it's been a". At the bottom of the editor, there is a status bar with the text "Path: p", "Word count: 13", and "Draft Saved at 1:54:24 pm.".

Or Just a Document

- DIDO --- Data Interactive Document
- Javascript WYSIWYG Editor included with document
- Edit data and viz in place and save



A Semantic Web Application?

- Doesn't use any Semantic Web technology
 - Native data format is JSON
 - Can read RDF, but nobody does
 - Dominant data model likely to be spreadsheets
 - No inference
 - We do generate URIs for exported items
- But focused on visualizing arbitrary schemas
- So, yes.

**I CAN'T HANDLE MY INCOMING
INFORMATION OVERLOAD. HELP!**

Van Kleek, Moore, Karger, schraefel

Atomate it! end-user context-sensitive automation using heterogeneous information sources on the web [WWW '10]

END USERS PROGRAMMING INFORMATION STREAM HANDLERS

Motivation

- We're acquiring large structured data repositories and real-time streams
- Lots of repetitive labor involved in users following/reacting to these streams
- How can users author queries/rules against these streams to reduce the drudgery?

Examples

- remind me to take out the trash when I get home on Tuesdays
- bug my friend who hasn't replied to me in 2 days
- send me my shopping list when I arrive at the grocery store
- remind friends of an event I'm going to attend
- text me important emails when I am traveling

What we need

- a way for users to express:
what they want to happen,
and when,
in terms of predicates relating
the **states** and **properties** of
people, places + things
in their world.

actions

conditions

predicates

properties

entities

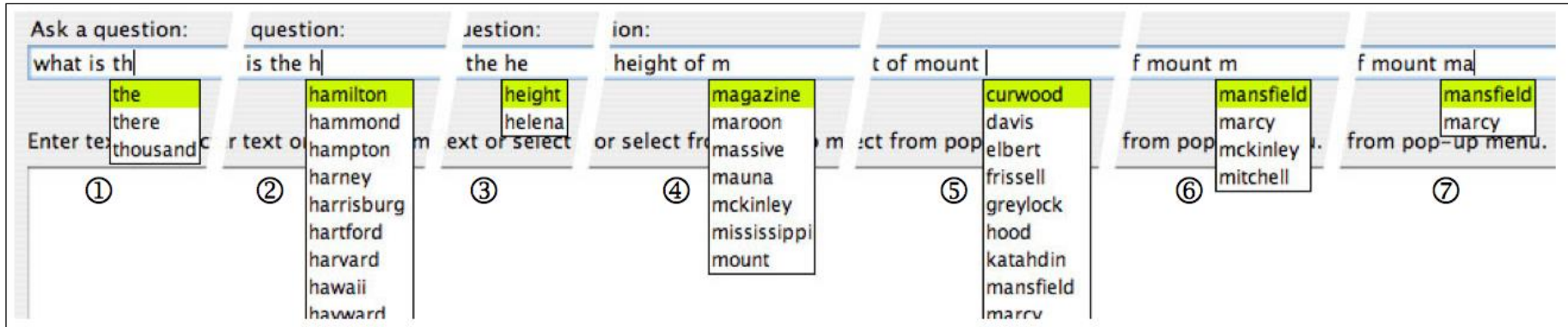
Controlled Natural Language Interface (CNLI) for Rules

- a way to **retrieve** and **interpret** data from our many
heterogeneous web sources as descriptions of these
familiar **people, places** and **things**

ATOM/RSS/REST APIs, End-user mashups + RDF

Controlled Natural Language Interface

previous work: for the construction of RDF KBs and queries:



Abraham Bernstein and Esther Kaufmann and Christian Kaiser and Christoph Kiefer, *Ginseng: A Guided Input Natural Language Search Engine for Querying Ontologies*, Jena User Conference, 2008.

express behaviors as *rules*

when <something happens> do <action>

query

statement

Example 1

- Simple Context-Sensitive Reminding
- Remind me to take the trash out when I get home on Tuesday evenings

QuickTime Player File Edit View Share Window Help Stop Recording OS Wed 5:24 PM

what would you like me to do?

my actions my stuff share me

when — who — does — what — + do something
ie: my current location ie: is near ie: Home

when - - - - save

Example 2: Travel Mangement

- When I'm traveling, warn people who e-mail me that I might not get back to them for a while.



what would **you** like me to do?

my actions

my stuff

share me

when who does what + do something
ie: my current location ie: is near ie: Home

when - - - -

save

Inside a rule

when (one-shot) / *whenever* (repeating)

ANTECEDENT (*conditions for execution*)

AND **predicate**(subj-pathquery, obj-pathquery-or-val)

AND predicate2(...) AND ...

CONSEQUENT (*what to do*)

action(arg-path-or-val, arg-path-or-val..)

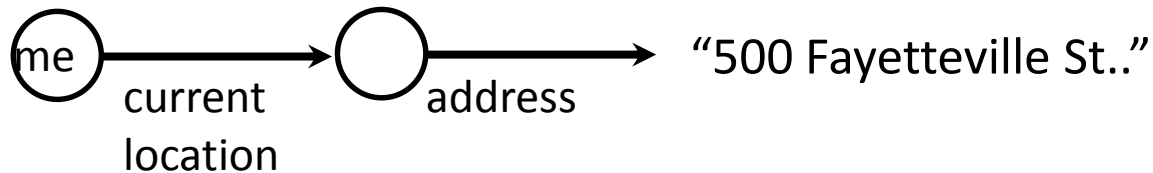
Rules in constrained natural language

entities represented by their label

(e.g., “David Karger”, “home”, and special pronoun “me”)

possessives for path queries

(e.g., my current location’s address)



infix english verbs for predicates

eq(number,number) => “is”

near(Location,Location) => “near”

Rules in constrained natural language

variables represented with “any/new <type>”

?x rdf:type :Person => “any Person”

newly created Person entity: “new Person”

bound variables with “that <type>”

“any Person’s birthday is today

email **that person** ‘happy birthday’”

Actions in constrained natural language

actions represented as fill-in-the-blank sentences with typed blanks

```
[“reply to”,  
  {name:“email” type:“schemas.Email”},  
  “with”,  
  { name: “message”, type:“schemas.String”} ]
```

reply to *email* with *message*

Study

- Can users create rules?
- Perceived difficulty of use
- Pitfalls
- Ideas for fixing these problems

Rule creation study (method)

- Recruited over the web
- Basic demographics, sign up, 2 minute tutorial video
- 9 Rule creation exercises
 - 2 time, 3 easy, 3 medium, 1 difficult
- Short exit survey:
 - On average, how difficult was it to create the rules?
 - Was there anything that was confusing/difficult?
 - How useful would such a system be to you?
 - What would you use this system for?
 - What else do you wish this system could do?

Rule 1 You have a meeting with a colleague tomorrow at 3pm. Set a reminder.

Rule 2 You have to provide a work status report every Thursday at 2pm. Set a reminder.

Rule 3 Set up an alert that notifies you whenever anyone you know is near your house.

Rule 4 Set an alert that notifies you when your boss, John von Neumann, arrives at his office.

Rule 5 You often forget to bring your shopping list with you to the store. Have atomate text you your new shopping list (1. eggs. 2. bread. 3. milk) to you when you arrive at your local grocery store (Cropz).

Rule 6 You have been buying too many books from Amazon.com. Remind yourself every time you visit amazon.com to check your local public library for the book.

Rule 7 You are working on an urgent project with Vannevar Bush and want to make sure to not miss new e-mails about it. Have Atomate alert you when you receive a new email from him containing the word “MEMEX” in the subject line.

Rule 8 Have Atomate automatically update your facebook status when you are at a concert.

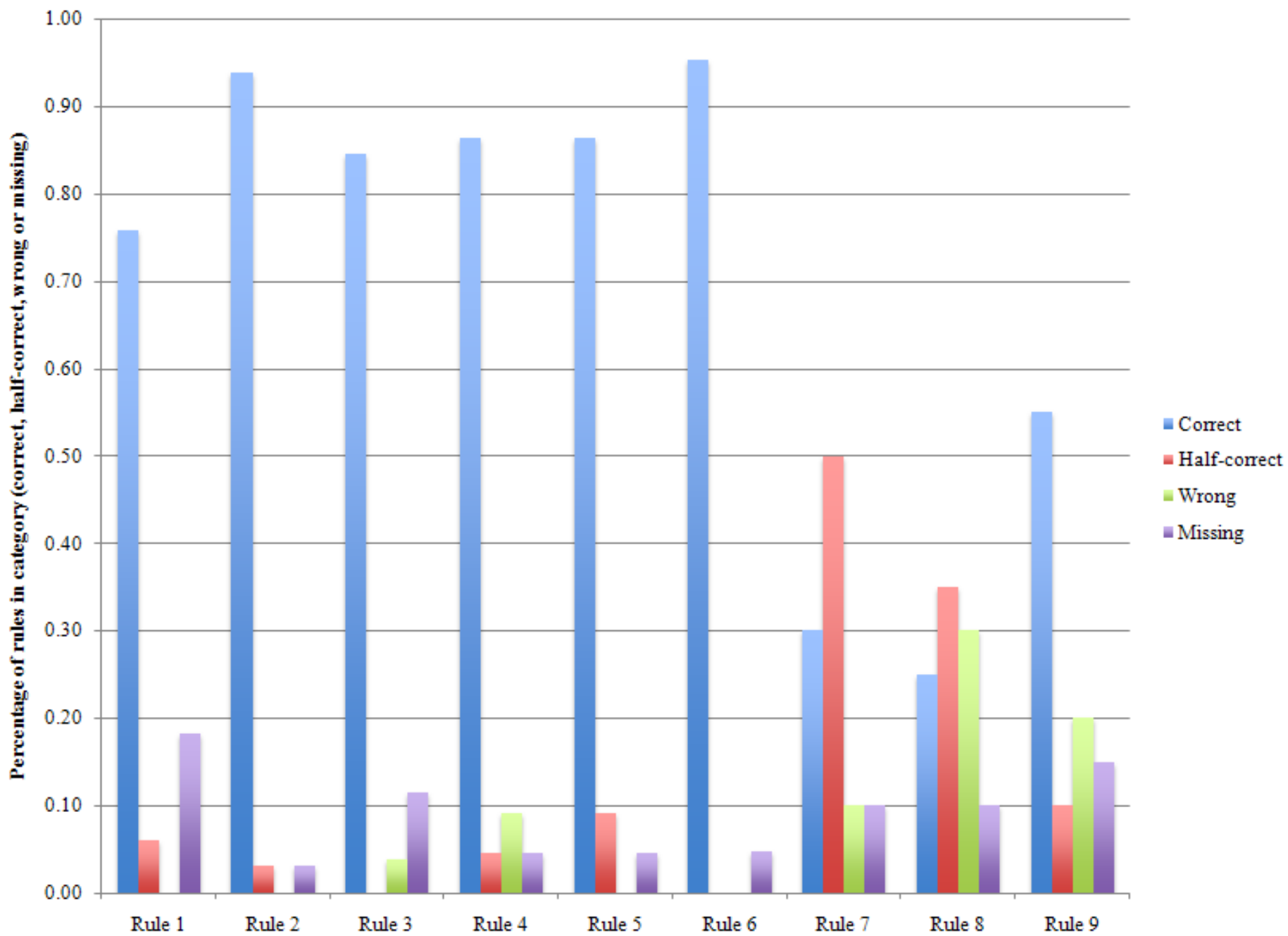
Rule 9 Have Atomate send you a text message when you have an activity scheduled in 5 minutes that is not close to where you are.

Rule creation study

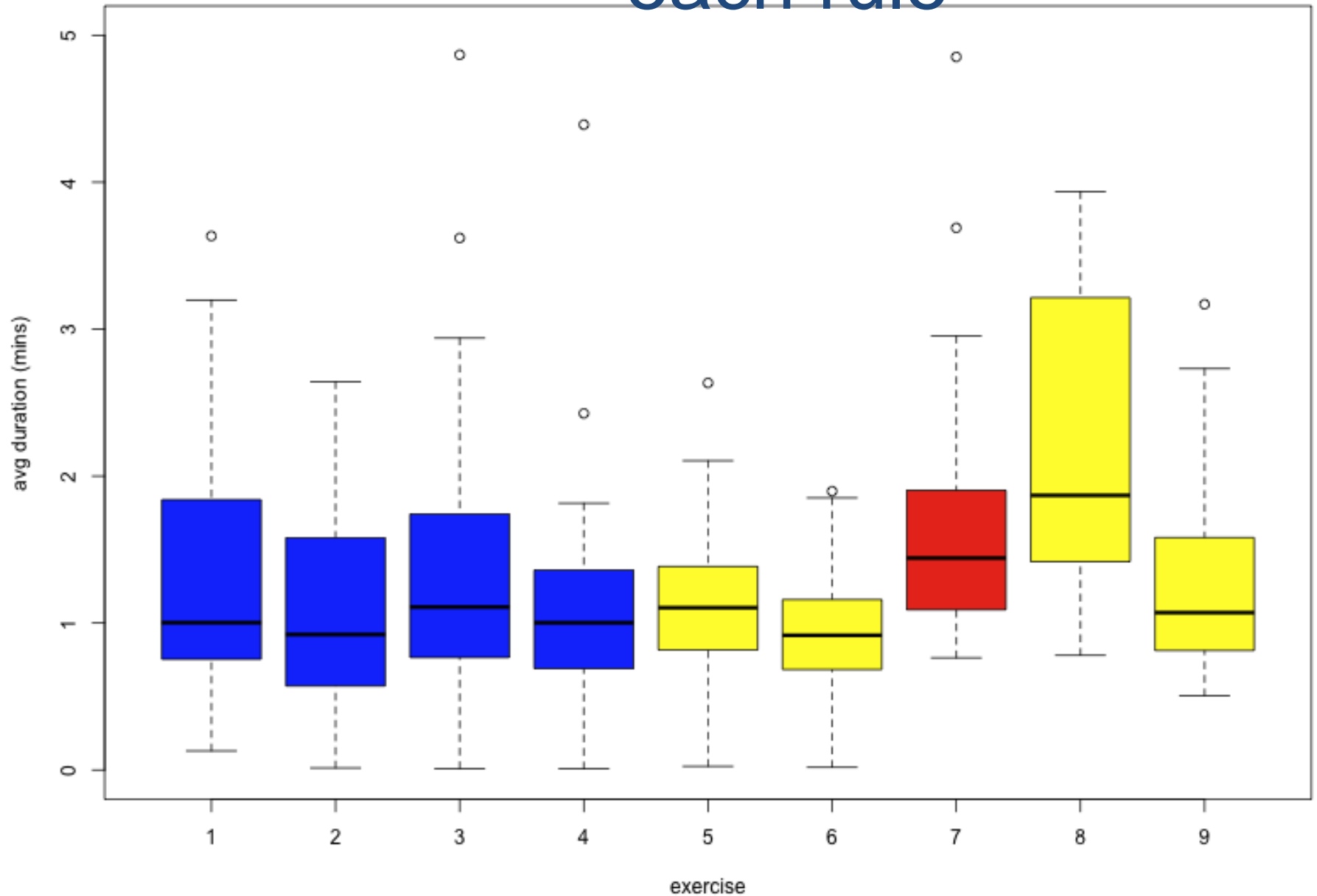
- November 2009
- 33 participants recruited (26 completed)
- Ages 25-45
- 14 had some programming experience
- All experienced with the Web

Rule creation study

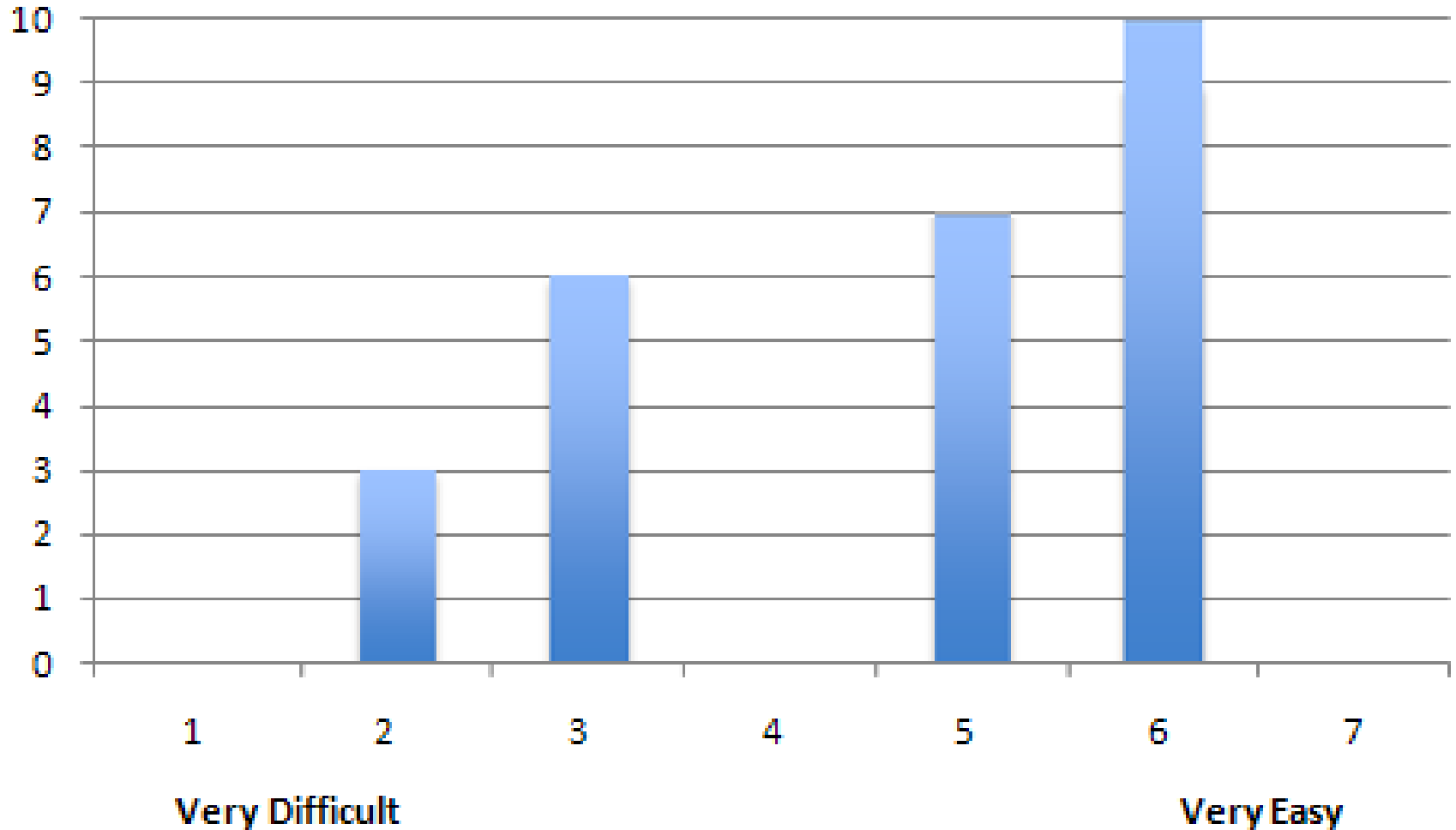
- Correct
 - rule expressed perfectly
- half-correct
 - rule insufficiently specific
 - will trigger more often than intended
- Wrong
 - 1 or more incorrectly expressed clause
 - will not fire at all, or not as intended
- Missing
 - rule not completed



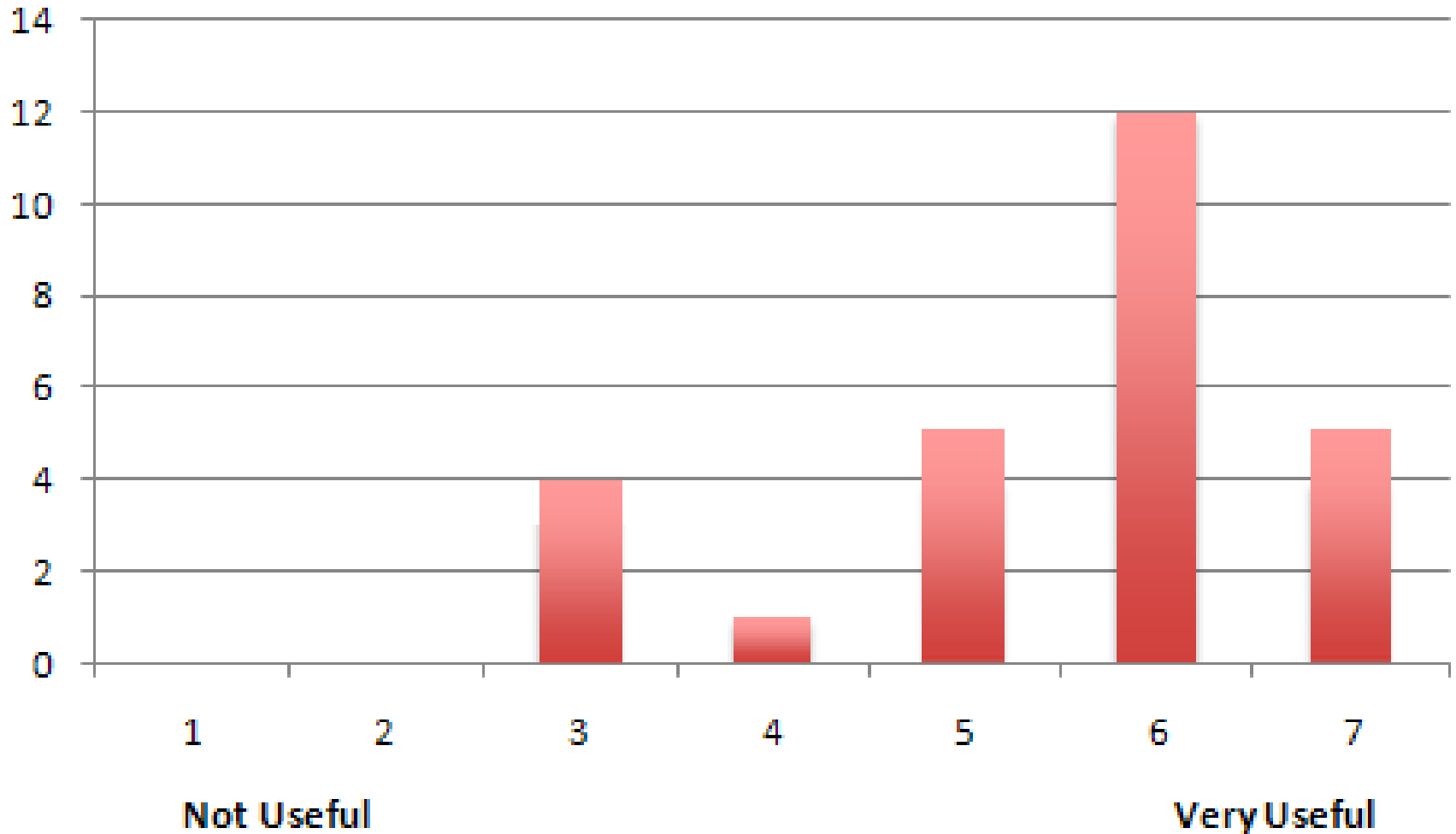
Average time to complete each rule



Perceived difficulty of creating rules



Perceived usefulness



What would you use atomate for?

(P4) Identifying when two locations converge (i.e. mine and a friend's are close). This is like social networking, but moving it towards actual life. People could grant access to their friends to view their locations, and thus know if people are close at a given time.

(P7) Reminding my friends and I that we have a shared event when we're both near each other. For example, I'm often meeting with someone and both of us want to go to the same event in an hour, but we get into a coding session and we forget about the event.

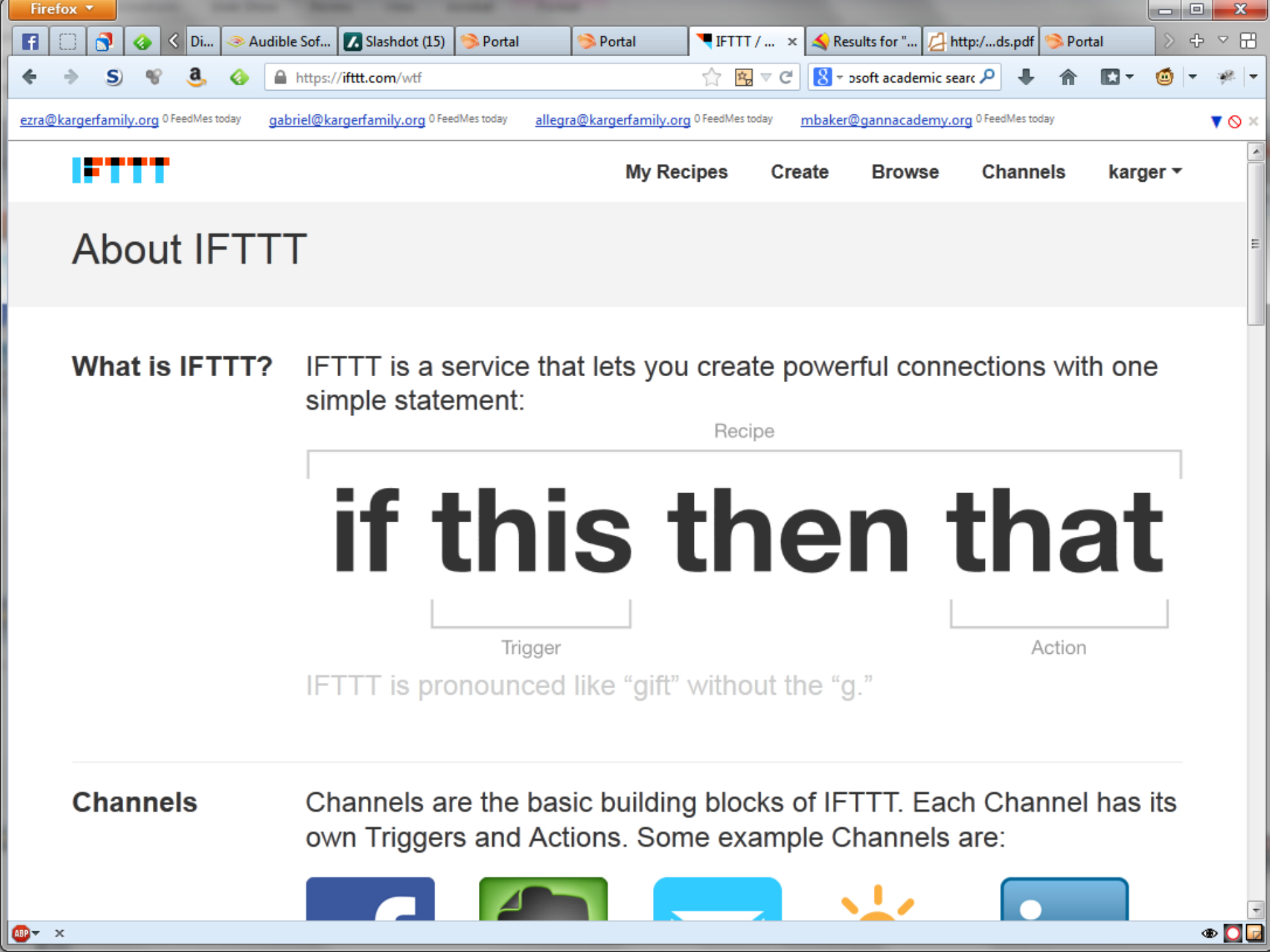
What would you use atomate for?

(P15) When I send email to someone and I want a response, I can tell atomate to send them a reminder email in 3 days if they haven't gotten back to me or something like that.

(P24) Emailing or responding to people when I am in transit or unavailable (no network connectivity or in an event where my phone's silenced)

Discussion

- A Semantic Web Application?
 - Yes, incorporates data in any schema
 - CNL adopts any incoming properties/values
- Inference over RDF store
 - Not “what is the most powerful inference engine”
 - Rather, “what inferrable language can users write?”
 - Lots of room to investigate/drop in better reasoners
- Contrast: If This Then That
 - Powerful site opened 2011
 - Over 1,000,000 rules created



About IFTTT

What is IFTTT? IFTTT is a service that lets you create powerful connections with one simple statement:

Recipe

if this then that

Trigger

Action

IFTTT is pronounced like "gift" without the "g."

Channels

Channels are the basic building blocks of IFTTT. Each Channel has its own Triggers and Actions. Some example Channels are:





Star Google Reader items to Evernote
by [dhowland](#) on Nov 22, 2011
used 13,781 times



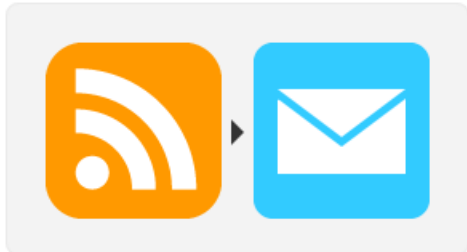
Email lifehacker's Download Roundup to yourself.
by [mbrando2](#) on Dec 24, 2011
used 2,906 times



When a new album is added to Amazon's Top Free MP3 Albums, send me an email.
by [cassa47](#) on Dec 24, 2011
used 13,688 times



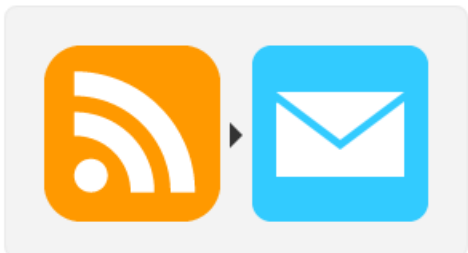
Text me if the CDC reports a Zombie outbreak
by [ericbock](#) on Aug 1, 2012
used 2,170 times



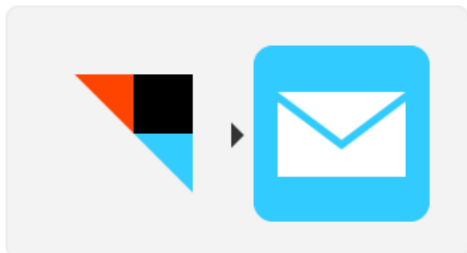
Get the Dilbert comic strip delivered to your inbox daily
by [hurmoth](#) on Jan 3, 2012
used 2,916 times



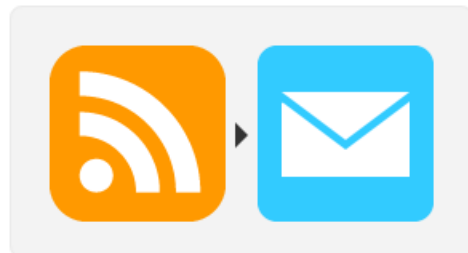
NOAA Severe Weather to SMS
by [sogrady](#) on Feb 29, 2012
used 2,316 times



RSS -> Mail
by [zib](#) on Oct 7, 2011
used 2,491 times



Get all the updates to IFTTT via email!
by [linden](#) on Nov 14, 2011
used 23,934 times



When a new book is added to Kindle Top 100 Free eBooks, send me an email
by [dude3966](#) on Nov 21, 2011

Create a Recipe

ifthisthen that

Click this to get started.

Choose Trigger Channel step 1 of 7

Showing Channels that provide at least one Trigger. [View all Channels](#)



App.net



bitly



Blogger



Boxoh Package Tracking



Buffer



BuzzFeed



Campfire



Craigslist



Date & Time



Delicious



Diigo



Dropbox



Email



ESPN



Etsy



Evernote



Facebook




Facebook Pages

Choose a Trigger


step 2 of 7

back ▲


New status message by you
This Trigger fires every time you create a new status message on Facebook.



New link post by you
This Trigger fires every time you create a new link post on Facebook.




New photo upload by you
This Trigger fires every time you upload a new photo on Facebook.



You are tagged in a photo
This Trigger fires every time you are tagged you in a new photo. NOTE: Facebook privacy settings may block IFTTT's access to some photos you are tagged in.

Your profile changes
A Trigger that monitors changes in your Facebook profile information. It works with these Facebook profile fields: Name, Profile picture, Location, Website, and Bio.



f Complete Trigger Fields

step 3 of 7

back ▲

Your profile changes

f Profile field to watch

Location ▼

Create Trigger



if  then that

Your profile changes
watching: location
on [David Karger's profile](#)



Choose Action Channel

step 4 of 7

back ▲

Showing Channels that provide at least one Action. [View all Channels](#)



App.net



bitly



blink(1)



Blogger



Box



Boxcar



Buffer



Campfire



Delicious



Diigo



Dropbox



Email



Evernote



Facebook



Facebook Pages



Flickr

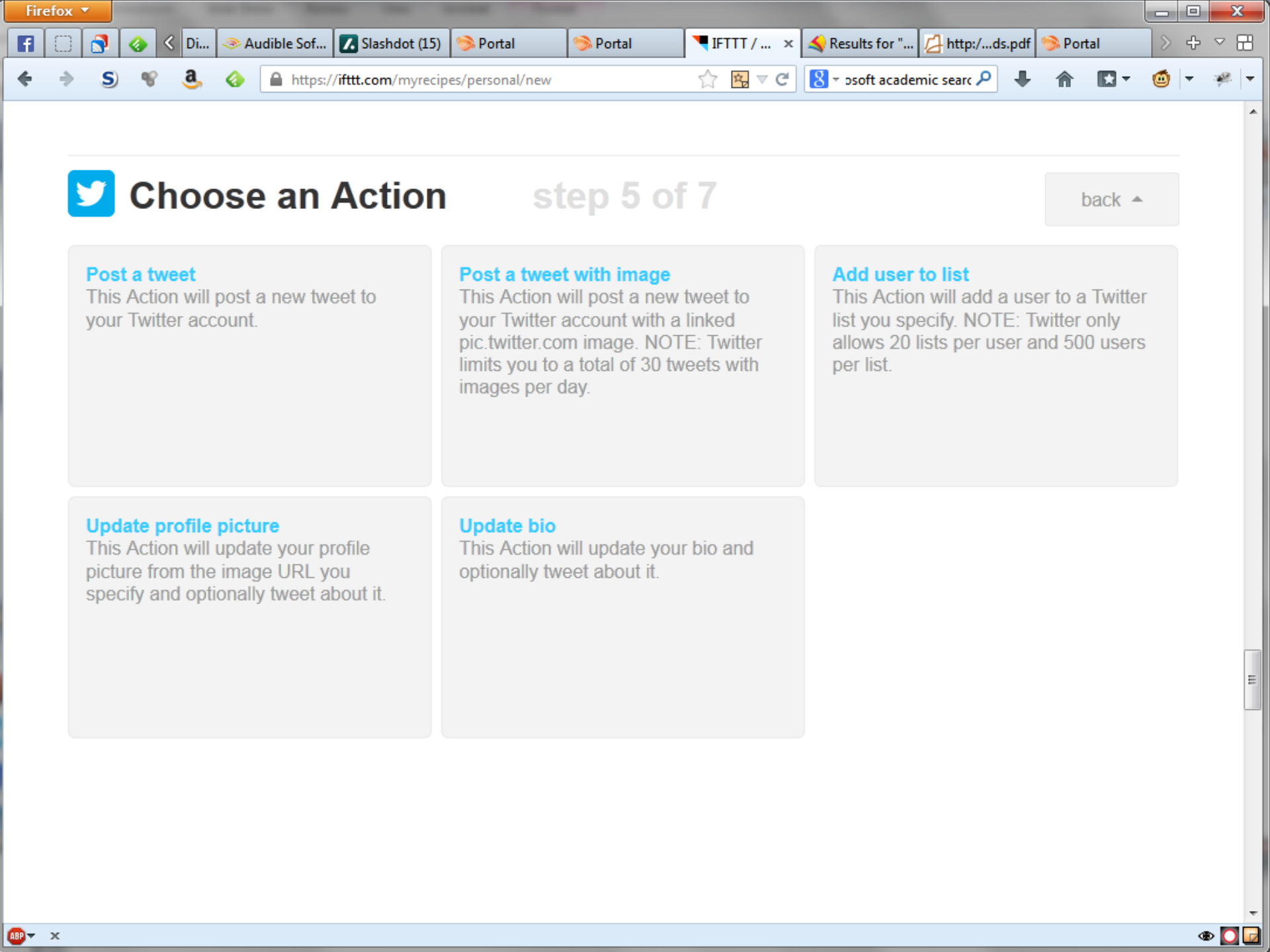


Gmail



Google Calendar





Choose an Action

step 5 of 7

back ▲

Post a tweet

This Action will post a new tweet to your Twitter account.

Post a tweet with image

This Action will post a new tweet to your Twitter account with a linked pic.twitter.com image. NOTE: Twitter limits you to a total of 30 tweets with images per day.

Add user to list

This Action will add a user to a Twitter list you specify. NOTE: Twitter only allows 20 lists per user and 500 users per list.

Update profile picture

This Action will update your profile picture from the image URL you specify and optionally tweet about it.

Update bio

This Action will update your bio and optionally tweet about it.

Complete Action Fields

step 6 of 7

back

Update bio

Bio

Bio 

limited to 160 characters

Tweet



optional

Create Action

What's Wrong With This?

- IFTTT is hard-coding its channels and rules
 - Users can only set parameters
 - At mercy of developer, like applications of yore
- Semantic Web/Atomate vision:
 - Each channel is an RDF feed
 - Rules are RDF queries
 - (must be end-user authorable, e.g. CNL)
- Power of a distributed system/web
 - Anyone can offer a new channel
 - Anyone can build a new rule engine/UI

SW Challenge: Build SWIFTTT

Summary

- 3 Semantic Web Applications
 - Supercharged spreadsheets for data management
 - Data and visualization authoring like HTML authoring
 - Automated handling of incoming information streams
- All driven by concrete end-user problems
 - Under umbrella of simplifying info management
- All assessed with user studies
- Make very little use of Semantic Web technology
- But all share key “open schema” paradigm

Whither ESWC?

ESWC Topics

- Information extraction/mining
 - Ontology alignment
 - Inference
 - Query languages
-
- Plenty of “semantic” but what “web”?
 - Work already had a place: AAAI, KDD, SIGMOD
 - What did we need a new field for?

Semantic Web

- A step on the road to artificial intelligence
- A study of the processes of cognition
 - Knowledge representation
 - Classification
 - Logical Inference
 - Probabilistic reasoning
 - Analogy (someday)
- Web is secondary, just a platform
- Long range
- Perspective is well represented at ISWC/ESWC

Semantic Web

- Improving human-information interaction
- Drawing on insights gained from the web
 - View source/copy/tweak
 - Tolerate inconsistency
 - Lightweight interactions
 - Standards
 - Power of the crowd
- But also HCI, DB, IR, ML
- Opportunity to rapidly and significantly improve the human condition

Where Are All the Intelligent Agents?

A Letter from the Editor



Where Are All the Intelligent Agents?

Editor: James Hendler
Rensselaer Polytechnic Institute
hendler@cs.rpi.edu

Intelligent Readers,

In the late 1990s, many of us believed that the large-scale deployment of “intelligent agent”-based computing was right around the corner. In the early 2000s, much US and international research funding focused on making this happen. This magazine and many others had hugely popular special issues on agents, and academic conferences on agent-based computing were abuzz, with many of us “old timers” beginning to believe that the time had really come. But now, looking at what’s hot on the Web, in IT development, and in venture capital circles, I find myself shaking my head and wondering, “Where are all the agents?”

Where Are All the Intelligent Agents?



Bringing Intelligence to Applications

- Until we solve AI, we'll have to make do with Artificial AI --- i.e. humans
- Good at things that are hard for computers
 - Entity extraction and disambiguation
 - Inference
 - Alignment
- Hate the drudgery of repetitive simple tasks
 - Which is exactly what computers can already do!
 - Moving data between applications
 - Reissuing numerous variants on same query

Where's the Science?

- Human Factors
- Must understand what people are good/bad at
- Design tools that address strengths/weaknesses
- These tools are **experiments**
- Not enough to build; must **evaluate**
 - By formulating hypotheses about users and usage
 - And testing in (controlled) lab and (uncontrolled) field

Choose Your Motivation Wisely

- Late 90s, a brief flurry of work on “algorithms and data-structures for faulty memories”
 - Algorithms that work well even if sometimes what you read isn’t what you wrote
- Generally preceded by an argument that as memories grow such faults become pervasive
- In fact, right solution is ECC RAM (now standard)
- Flurry was stimulated by a purchaser at Google trying to cover up a bad (non ECC RAM) purchasing decision

Hammers vs. Nails

- Don't define work/field by particular technology
- Start with the problem that needs to be solved
- Then find any technology necessary to solve it
- Don't forget the original motivation
 - It might become obsolete

- How do you describe your tool to end users?
 - They care about what new thing it enables/simplifies
 - Not about how cleverly it does what it does

Karger's Best ESWC Papers

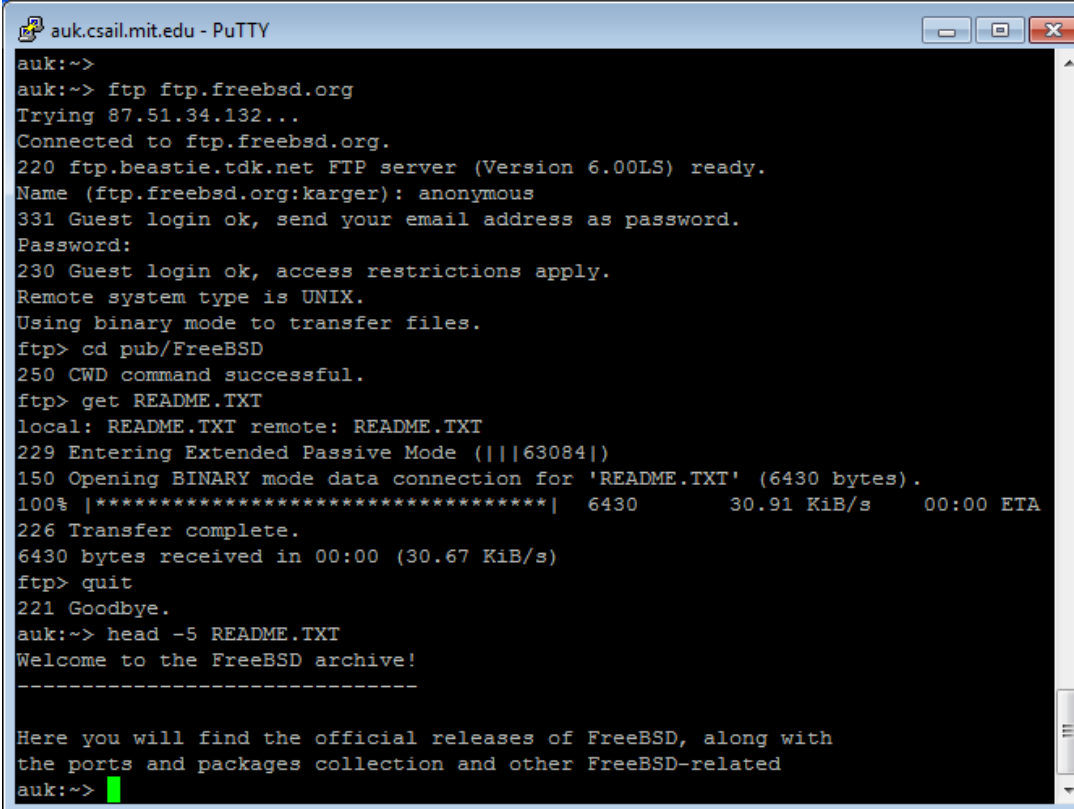
- A Session-based Approach for Aligning Large Ontologies
- Broadening the Scope of Nanopublications
- Multilingual semantic wiki based on Attempto Controlled English and Grammatical Framework
- Personalized Concept-based Search and Exploration on the Web of Data using Results Categorization
- Collecting Links Between Entities Ranked by Human Association Strengths
- Guiding the evolution of a multilingual ontology in a concrete setting
- Connecting the Smithsonian American Art Museum to the Linked Data Cloud

Semantic Web Apps at ESWC

- ESWC does offer Semantic Web Apps
 - Mashup challenge
 - Demo session
- Why aren't these appearing as papers?
- The missing piece: evaluation
 - What happens when users try to use it?
 - What happens when the schema changes?

Semantic Web Applications

- “Semantic” is a modifier on “Web”
- What was so new/wonderful about the web?
- Fetching remote pages?



```
auk.csail.mit.edu - PuTTY
auk:~>
auk:~> ftp ftp.freebsd.org
Trying 87.51.34.132...
Connected to ftp.freebsd.org.
220 ftp.beastie.tdk.net FTP server (Version 6.00LS) ready.
Name (ftp.freebsd.org:karger): anonymous
331 Guest login ok, send your email address as password.
Password:
230 Guest login ok, access restrictions apply.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> cd pub/FreeBSD
250 CWD command successful.
ftp> get README.TXT
local: README.TXT remote: README.TXT
229 Entering Extended Passive Mode (|||63084|)
150 Opening BINARY mode data connection for 'README.TXT' (6430 bytes).
100% |*****| 6430 30.91 KiB/s 00:00 ETA
226 Transfer complete.
6430 bytes received in 00:00 (30.67 KiB/s)
ftp> quit
221 Goodbye.
auk:~> head -5 README.TXT
Welcome to the FreeBSD archive!
-----
Here you will find the official releases of FreeBSD, along with
the ports and packages collection and other FreeBSD-related
auk:~>
```

Semantic Web Applications

- “Semantic” is a modifier on “Web”
- What was so new/wonderful about the web?
 - Could always author & view docs on our computers
 - Could always access them with ftp
- “Minor” workflow changes
 - URL: canonical way for a doc to reference other docs
 - click: instant access to what’s at the link
 - browser: staying inside one application

The web did not make new things possible.

It made old things simple.

Can SW do the same?

Conclusion

- A key innovation opportunity in the Semantic Web is making it easier for end users to produce, share, and consume structured data
- An urgent need and immediate opportunity for tools that take the drudgery out of data work
- We have to study end users to understand their needs, build tools to meet those needs, and assess how well those tools work
- Don't ask what you can do for the Semantic Web; ask what the Semantic Web can do for you!

Homebrew Databases: Complexities of Everyday Information Management in Nonprofit Organizations



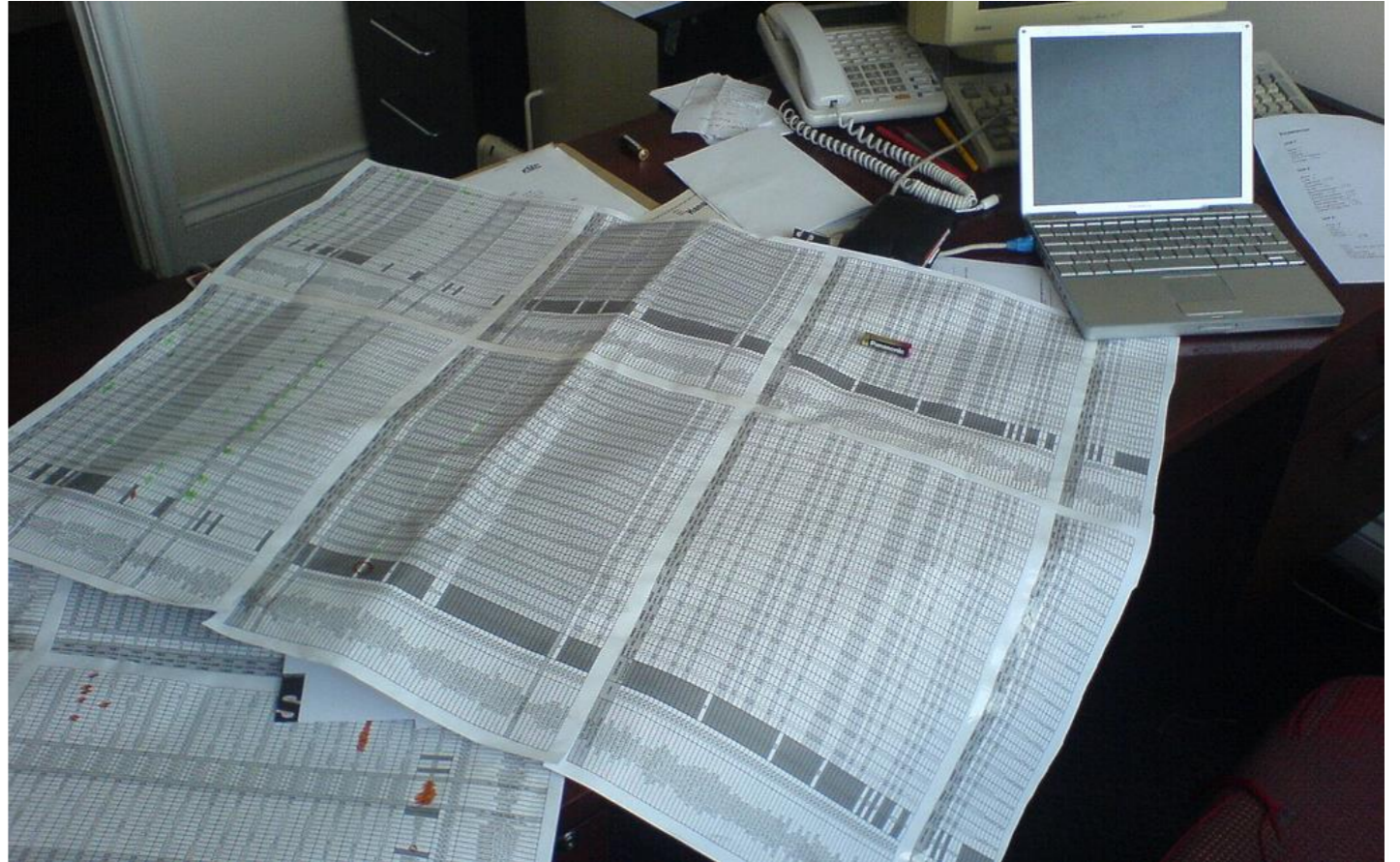
Amy Volda
UC Irvine



Ellie Harmon
UC Irvine



Ban Al-Ani
UC Irvine



To Do:

Health:

- climb mountains/hike/walk.
- stretch/ yoga (get a book)
- re-activate health club membership in fall (check status)
- start trainer again. (hold until fall?)

House:

- move stuff from garage to spare room
- set up CD player + emergency radio.
- paint top of deck door.
- hang pictures
- Hang remaining blinds
- paint/prime deck (purchase)
- shelving into closet
- stake tomato plants

Close Dimensions (in inches)

- 26.5 w x 13.5 h x 12 d OR
- 24.5 w x 14.0 h x 12 d
- 23.0 w x 14.0 h x 12 d
- 35.0 w x 36.0 h x 12 d

Purchase:

- chains + emergency kit for car
- ~~fire ladder~~
- ~~vacuum cleaner attachments (for stairs etc)~~
- ~~rollers / flat iron for hair~~
- ~~second spice rack / new wood hung~~
- ~~find better matching for V.I.~~

Financial:

- Social last month + dep into business acct. + then next mo !!
- Get the \$1000.00 from V.I. Pass
- ~~silver odds + ends to sell.~~

Other:

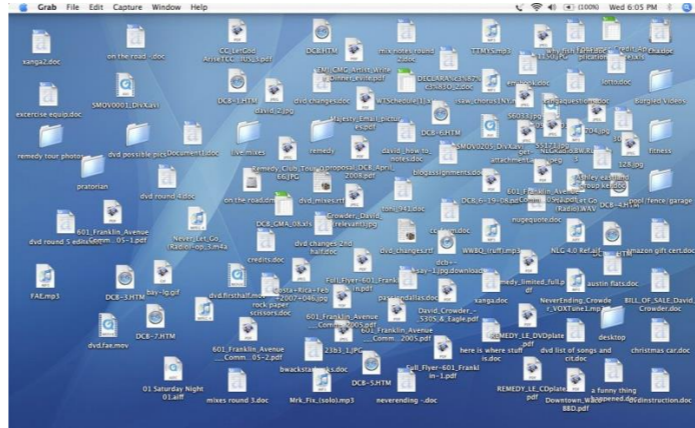
- research LEED cert. + make a p
- ~~plan a few summer trips~~
- plan Hawaii trip (buy a Hawaii guide) ← VI to call back
- follow up on V.I. Passports prizes:
 - trip to Las Vegas
 - dinner + limo
 - 1000.00 for shopping spree on-line
- Julie Bacon (massage) 200.
- ~~gift for Maatia~~
- make gym. appt
- passport application → need photos; verify cost; mumszi
- Goodwill ~~for shoes~~ (boots, clothing, shoes, etc)
- ~~review coming on 13-20-10~~
- Find wood Buddha + straw hat.
- Complete mending jacket + bird
- call ~~\$\$\$~~ + register new card.

resched. Lani.

get the companion photo

Dining + Luxury via Service

206 -



iTunes

Baba L'Rouami
Gnawa Night Spirit Masters

0:25 -2:42



View



Search

- Reggae
- WorldBeat CDi...
- ΩStarry
- ΩiTunes Friday
- 'New Rips
- * This Years Mod...
- *Gravitas
- 5 count
- 150 greatest hits
- 2002-03 models
- 2004 models
- 2005 Models
- a randomizer 90
- Albumizer
- All
- Chios files
- high res unplayed
- Music Videos
- R&B
- R&B Podlizer
- Reggae CDizer
- RockSnob iPod
- World Beat
- Zoinks iPod
- (Clutter)
- 33.3
- 500 Rolling Stone
- 500 RS Chios
- Best songs 2004
- Block Party!
- brains
- Celtic Groove
- Crazy Grits
- Debut albums
- emusic
- Punk rainbow
- Rock Snobs



The Name Of This Band Is Talking Heads
Talking Heads

▲	Name	Artist	Time	Album	Year	Last Played	Play C	My Rating	Genre	Date
2	<input checked="" type="checkbox"/> Jesus The Missing Years	Prine, John	5:55	The Missing Years	1991	9/13/06 10:20 AM	13	★★★★	Folk	1/...
3	<input checked="" type="checkbox"/> The Luck of the Irish	Lennon, John	2:56	Sometime in New York ...	1972	9/13/06 10:22 AM	14	★★★★	Rock	12/...
4	<input checked="" type="checkbox"/> Screw You, We're from Texas	Hubbard, Ray W...	4:04	Growl	2003	9/13/06 10:26 AM	5	★★★★	Alt-Country	2/...
5	<input checked="" type="checkbox"/> The Great Curve	Talking Heads	6:42	The Name Of This Ban...	1980	9/13/06 10:33 AM	11	★★★★	Indie	9/...
6	<input checked="" type="checkbox"/> The Big Country	Talking Heads	5:09	The Name Of This Ban...	1978	9/13/06 10:38 AM	14	★★★★	Indie	9/...
7	<input checked="" type="checkbox"/> Cut Your Hair	Pavement	3:06	Crooked Rain Crooked ...	1994	9/13/06 10:41 AM	14	★★★★	Alternative...	1/...
8	<input checked="" type="checkbox"/> Cabbage Alley	Meters	3:30	Very Best Of The Meters	1972	9/13/06 10:45 AM	14	★★★★	Funk	12/...
9	<input checked="" type="checkbox"/> Positive	Spearhead	4:29	Home	1994	9/13/06 10:49 AM	7	★★★★	Hip Hop/Rap	5/...
10	<input checked="" type="checkbox"/> Strange	Wire	3:58	Pink Flag	1977	9/13/06 10:54 AM	9	★★★★	Alternative...	1/...
11	<input checked="" type="checkbox"/> Long Legged Guitar Pickin' ...	Cash, Johnny &...	2:37	Carryin' On with Johnn...	1973	9/13/06 10:55 AM	14	★★★★	Folk	7/...
12	<input checked="" type="checkbox"/> Ring Worm	Morrison, Van	1:32	The Bang Records Con...	1968	9/13/06 10:57 AM	8	★★★★	Indie	9/...
13	<input checked="" type="checkbox"/> Fool's Paradise	Allison, Mose	3:32	Mose Alive	1967	9/13/06 11:00 AM	9	★★★★	Jazz	7/...
14	<input checked="" type="checkbox"/> We Better Talk This Over	Dylan, Bob	4:07	Street Legal	1978	9/13/06 11:04 AM	14	★★★★	Rock	2/...
15	<input checked="" type="checkbox"/> Baba L'Rouami	Gnawa Night Sp...	3:07	Gnawa Music Of Marra...	1990	8/14/06 10:41 PM	12	★★★★	African	3/...
16	<input checked="" type="checkbox"/> Jesus Wants Me For A Sunb...	Vaselines, The	3:31	The Way Of The Vaseli...	1992	5/26/06 8:04 AM	3	★★★★	Indie	4/...
17	<input checked="" type="checkbox"/> Where I Lead Me	Van Zandt, Tow...	2:47	Delta Momma Blues	1971	8/14/06 9:30 AM	9	★★★★	Cosmic A...	10/...
18	<input checked="" type="checkbox"/> I Ain't Got No Home [Live]	Band, The	3:46	A Musical History	1968	8/31/06 11:05 PM	4	★★★★	Rock	7/...
19	<input checked="" type="checkbox"/> Sir Duke	Wonder, Stevie	3:54	Songs In The Key of Life	1976	8/3/06 10:26 AM	8	★★★★	R&B	6/...
20	<input checked="" type="checkbox"/> Oculi Filioli (Junior's Eyes)	Rondellus	5:33	Sabbatum	2002	9/9/06 4:20 PM	16	★★★★	Classical	1/...



Below is the list of available variables for this template.
You can use template variables within your subject or me
The following variables can also be used:
%Date, %DateTime, %Time, %ServerTimeZone, %Email
%NotificationToList, %NotificationCCList

Template Variables

*Value	*Description
%1	URL
%2	EMPLID
%3	EMPLNAME
%4	SUBMISSION_DATE
%5	SHEET_ID
%6	SHEET_NAME
%7	BUSINESS_PURPOSE
%8	TOTAL_AMOUNT
%9	TOTAL_REIMB_AMT
%10	CURRENCY_CD
%11	HI_THERE_I_SEE_YOU



```
[default]
SELECT A.EMPLID
, B.NAME EMPLNAME
, %DateOut(A.SUBMISSION_DATE)
, A.SHEET_ID
, A.SHEET_NAME
, C.DESCR BUSINESS_PURPOSE
, A.TOTAL_AMT
, SUM(CASE WHEN E.REIMBURSEMENT_CD = 'R'
AND F.EXPEND_MTHD_EDIT = 'EMP' THEN E.MOM
END) - A.ADVANCE_AMT
, A.CURRENCY_CD
, Z.HI_THERE_I_SEE_YOU
FROM PS_EX_SHEET_HDR A
, PS_PERSONAL_DATA B
, PS_EX_PURPOSE_TBL C
, PS_EX_SHEET_LINE E
, PS_EX_EXP_MTHD_TBL F
```



#	Name	Artist	Time	Album	Year	Last Played	Play C.	My Rating	Genre	Dat
2	Jesus The Missing Years	Prime, John	5:55	The Missing Years	1991	9/13/06 10:20 AM	13	★★★★	Folk	14
3	The Luck of the Irish	Lennon, John	2:56	Sometime in New York ...	1972	9/13/06 10:22 AM	14	★★★★	Rock	15
4	Screw You, We're from Texas	Hubbard, Ray W...	4:04	Crowl	2003	9/13/06 10:26 AM	5	★★★★	Alt-Country	2
5	The Great Curve	Talking Heads	6:42	The Name Of This Ban...	1980	9/13/06 10:33 AM	11	★★★★	Indie	9
6	The Big Country	Talking Heads	5:09	The Name Of This Ban...	1978	9/13/06 10:38 AM	14	★★★★	Indie	9
7	Cut Your Hair	Pavement	3:06	Crooked Rain Crooked ...	1994	9/13/06 10:41 AM	14	★★★★	Alternative...	11
8	Cabbage Alley	Meters	3:30	Very Best Of The Meters	1972	9/13/06 10:45 AM	14	★★★★	Funk	12
9	Positive	Spearhead	4:29	Home	1994	9/13/06 10:49 AM	7	★★★★	Hip Hop/Rap	5
10	Strange	Wire	3:58	Pink Flag	1977	9/13/06 10:54 AM	9	★★★★	Alternative...	1
11	Long Legged Guitar Pickin' ...	Cash, Johnny &...	2:37	Carryin' On with John...	1973	9/13/06 10:55 AM	14	★★★★	Folk	7
12	Ring Worm	Morrison, Van	1:32	The Bang Records Con...	1968	9/13/06 10:57 AM	8	★★★★	Indie	9
13	Foot's Paradise	Allison, Mose	3:32	Mose Alive	1967	9/13/06 11:00 AM	9	★★★★	Jazz	7
14	We Better Talk This Over	Dylan, Bob	4:07	Street Legal	1978	9/13/06 11:04 AM	14	★★★★	Rock	2
15	Baba L'Rouami	Gnawa Night Sp...	3:07	Gnawa Music Of Marra...	1990	8/14/06 10:41 PM	12	★★★★	African	3
16	Jesus Wants Me For A Sunb...	Vaselines, The	3:31	The Way Of The Vase...	1992	5/26/06 8:04 AM	3	★★★★	Indie	4
17	Where I Lead Me	Van Zandt, Tow...	2:47	Delta Momma Blues	1971	8/14/06 9:30 AM	9	★★★★	Cosmic A...	11
18	I Ain't Got No Home (Live)	Band, The	3:46	A Musical History	1968	8/31/06 11:05 PM	4	★★★★	Rock	7
19	Sir Duke	Wonder, Stevie	3:54	Songs In The Key of Life	1976	8/3/06 10:26 AM	8	★★★★	R&B	6
20	Occhi Filloli (Junior's Eyes)	Rondellus	5:33	Sabbatum	2002	9/9/06 4:20 PM	16	★★★★	Classical	1

Below is the list of available variables for this template. You can use template variables within your subject or m. The following variables can also be used:

- %Date, %DateTime, %Time, %ServerTimeZone, %Email
- %NotificationCList, %NotificationCCLIST

Value	Description
%1	URL
%2	EMPLID
%3	EMPLNAME
%4	SUBMISSION_DATE
%5	SHEET_ID
%6	SHEET_NAME
%7	BUSINESS_PURPOSE
%8	TOTAL_AMOUNT
%9	TOTAL_REIMB_AMT
%10	CURRENCY_CD
%11	HI_THERE_J_SEE_YOU

```

SELECT A.EMPLID
, B.NAME EMPNAME
, %DateOut(A.SUBMISSION_DATE)
, A.SHEET_ID
, A.SHEET_NAME
, C.DESCR BUSINESS_PURPOSE
, A.TOTAL_AMT
, SUM(CASE WHEN E.REIMBURSEMENT_CD = 'R'
AND F.EXPEND_MTHD_EDIT = 'EMP' THEN E.NON
EMD) - A.ADVANCE_AMT
, A.CURRENCY_CD
, Z.HI_THERE_J_SEE_YOU
FROM PS_EX_SHEET_HDR A
, PS_PERSONAL_DATA B
, PS_EX_PURPOSE_TBL C
, PS_EX_SHEET_LINE E
, PS_EX_EXP_MTHD_TBL F
  
```










- ❖ This is where we get crazy. This is nuts. We actually—we don't have a database of our volunteers.... I shouldn't say that. We have probably seven databases for volunteers. All of them have different information. It took us three to four months to even figure out who had what databases.
 - ❖ - Volunteer Coordinator at a Human Services Nonprofit (P1)

Your Whirlwind Tour of Homebrew Databases

- ❖ Method
- ❖ Homebrew Databases: Example & Definition
- ❖ Homebrew Databases: Configurations & Challenges
 - ❖ Personal Office Applications as “Databases”
 - ❖ Paper-Based “Databases”
 - ❖ Enterprise & Custom Databases

Method

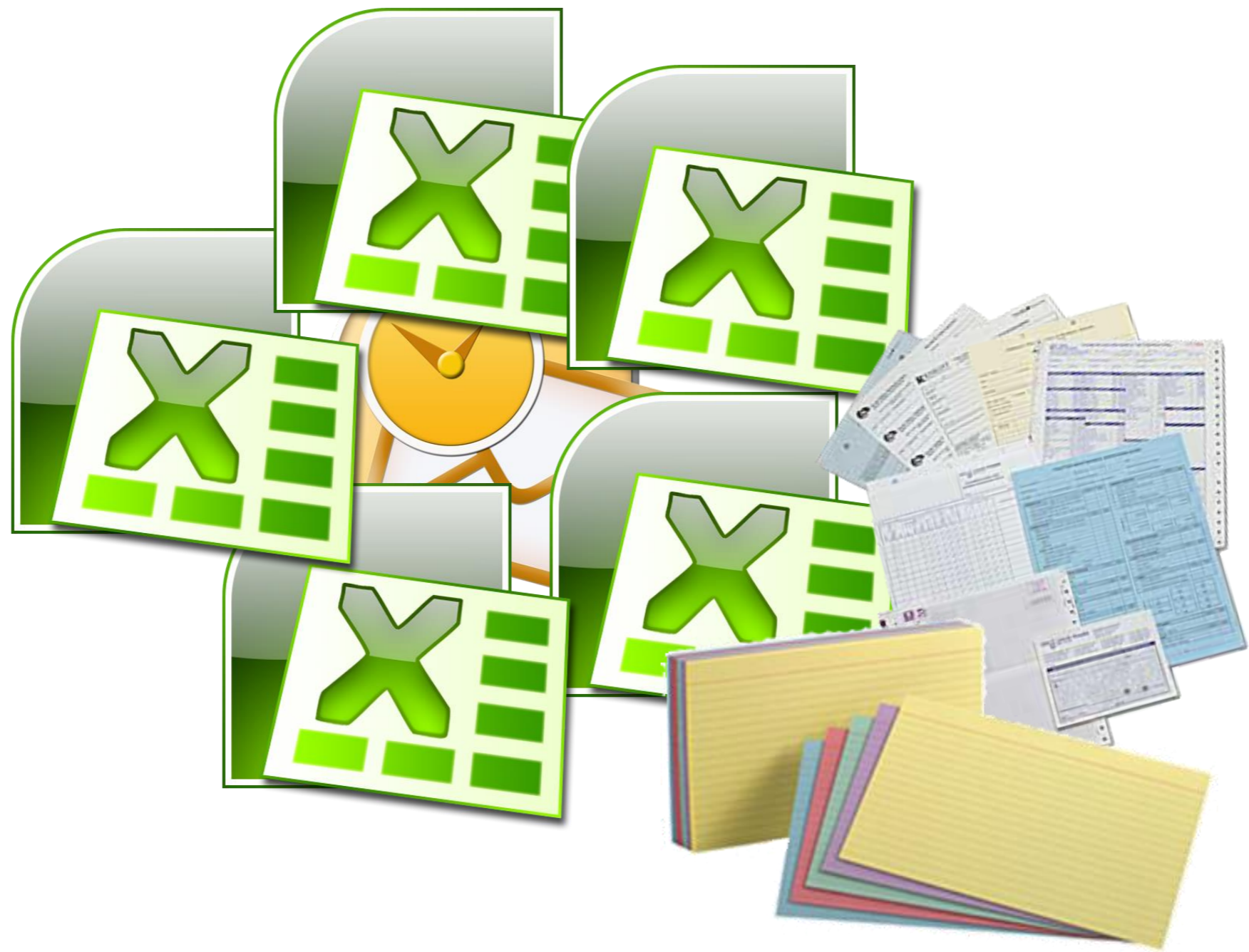
- ❖ Semi-structured Interviews
- ❖ 23 Volunteer Coordinators
 - ❖ Variety of Job Titles, Locations within the Organization
 - ❖ Variety of Sizes (& Maturity) of Volunteer Programs
 - ❖ Variety of Domains for Nonprofit Work
- ❖ Iterative, Inductive Data Analysis



















Challenges with a Multiplicity of Systems

- ❖ Redundant data entry... have to (manually) re-enter a different subset of the data in every system
- ❖ Version control issues... information falls out of sync across multiple “databases”
- ❖ Information management systems are abandoned

- ❖ ...and at the point when you have to do multiple entries is when you don't do entries. You know, it just is so time-consuming and redundant that you have so many other things to do, that you just don't have the time to enter it.
 - ❖ - Volunteer Coordinator at a Housing & Shelter Nonprofit (L2)

Homebrew Database

- ❖ An assemblage of information management resources that people have pieced together to satisfy their information management needs.
- ❖ Involved multiple systems
- ❖ Sometimes included actual database software but more typically consisted of other resources
- ❖ Participants referred to it as their “database” or “databases”

Types of Systems in the Homebrew Databases

- ❖ Personal office applications as “databases”
- ❖ Paper-based “databases”
- ❖ Enterprise or custom databases

Personal Office Applications as Databases

Personal Office Applications as Databases

- ❖ The allure...
- ❖ Readily available
- ❖ Already familiar
- ❖ Can be used flexibly

Personal Office Applications as Databases

The allure...

- ❖ Readily available
- ❖ Already familiar
- ❖ Can be used flexibly

The problems that arise...

- ❖ Failure to scale
 - ❖ Number of users
 - ❖ Number of records
 - ❖ Dimensions of data
- ❖ Inaccessibility
 - ❖ Access and aggregation
 - ❖ From off-site locations

- ❖ We were crashing the system for a year and a half and no one told us. Our network would go down every time we sent an email out to all the volunteers, but there was never the connection made. And one day I was pulled over to the data room and, “Do you recognize these email addresses?” I’m like, “Yes, those are our volunteers!”
 - ❖ - Volunteer Coordinator at an Animal Welfare Nonprofit (D2)

Personal Office Applications as Databases

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- ❖ Readily available
- ❖ Already familiar

The problems that arise...

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 - ❖ Number of users
 - ❖ Number of records
 - ❖ Dimensions of data
- ❖ Inaccessibility
 - ❖ Access and aggregation
 - ❖ From off-site locations

Paper-Based Databases

Paper-Based Databases

The allure...

- ❖ Supports collaboration
- ❖ Tangible “master” copy doesn’t fall out of sync
- ❖ Serves as a lowest common denominator
- ❖ Provides a shared awareness of process

Paper-Based Databases

The allure...

- ❖ Supports collaboration
- ❖ Tangible “master” copy doesn’t fall out of sync
- ❖ Serves as a lowest common demoninator
- ❖ Provides a shared awareness of process

The problems that arise...

- ❖ Failure to scale
- ❖ Inaccessibility

...but magnified!

Enterprise or Custom Databases

Enterprise or Custom Databases

- ❖ The allure...
- ❖ Ability to handle scalability of data and users

Enterprise or Custom Databases

The allure...

- ❖ Ability to handle scalability of data and users

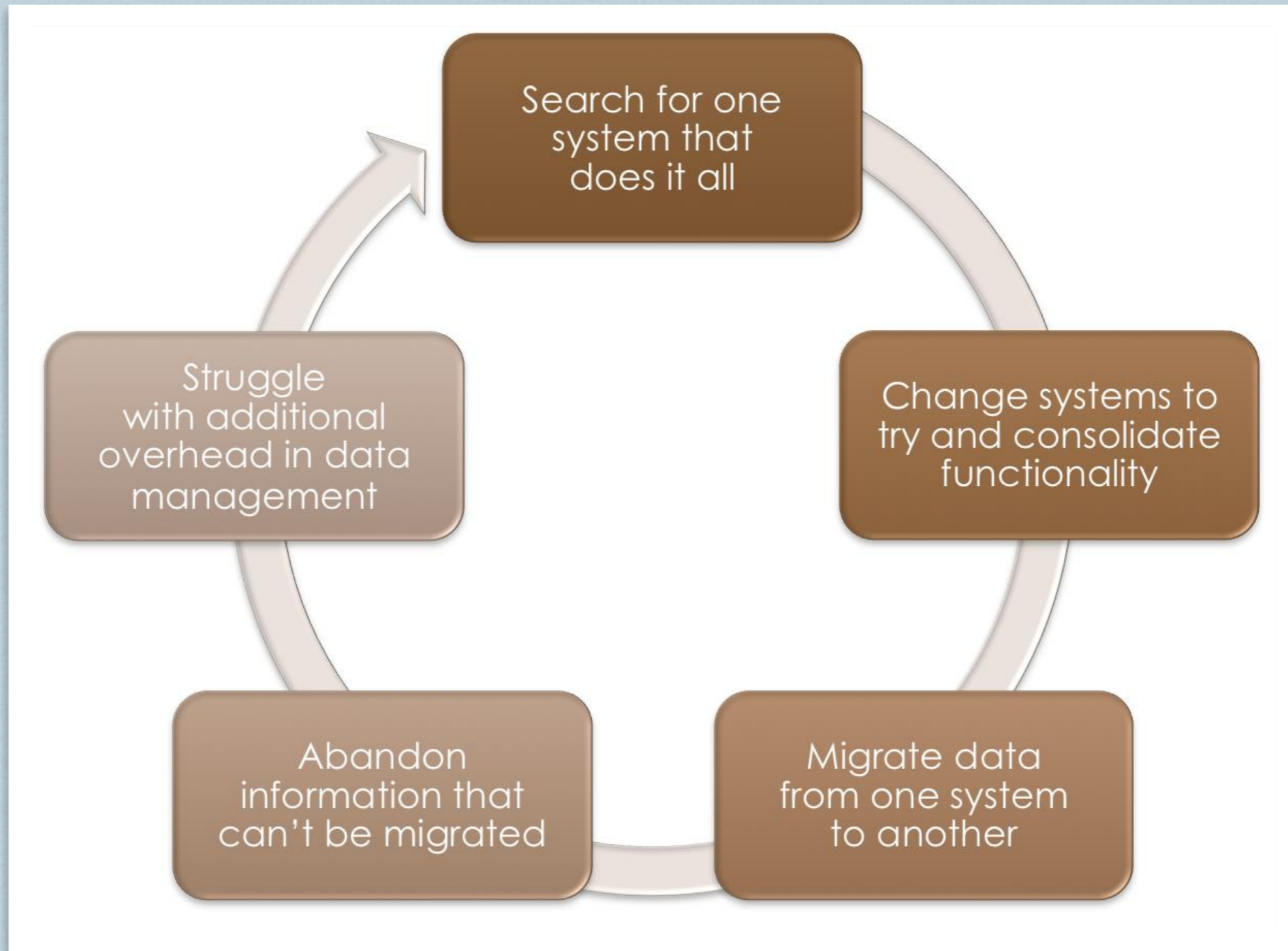
The problems that arise...

- ❖ Overhead & setup cost
 - ❖ Developing the system
 - ❖ Training people to use the system
 - ❖ Initial data entry
- ❖ Inaccessibility of the data
- ❖ Ongoing overhead with data entry

❖ So, I guess that's part of the daily [work], too, is the input of the night before's volunteer hours, which is a little backed up right now... My volunteer who does that has been sick for a while.... We try to keep up with it and it just gets away from you. We could use extra hands, but that means extra computers and extra spots to sit.

❖ - Volunteer Coordinator at a Food & Nutrition Nonprofit (K1)

The Cycle of Reconfiguration





Improving the Human Factors Aspect of Database Interactions

BEN SHNEIDERMAN
University of Maryland

The widespread dissemination of computer and information systems to nontechnically trained individuals requires a new approach to the design and development of database interfaces. This paper provides the motivational background for controlled psychological experimentation in exploring the person/machine interface. Frameworks for the reductionist approach are given, research methods discussed, research issues presented, and a small experiment is offered as an example of what can be accomplished. This experiment is a comparison of natural and artificial language query facilities. Although subjects posed approximately equal numbers of valid queries with either facility, natural language users made significantly more invalid queries which could not be answered from the database that was described.

Key Words and Phrases: human factors, database systems, data models, query languages, natural language interfaces, psychology, experimentation
CR Categories: 4.33, 4.6, 3.72

1. INTRODUCTION

As questions of technical feasibility and performance of database systems are resolved, increased attention is being paid to human factors. There is widespread recognition that future systems will be commercially viable only if the user interface is in harmony with user skills and task requirements. Management increasingly focuses on human factors, but technical professionals have shown little predilection to go beyond introspection and their own experience. Unfortunately, the background of a systems or language designer may be profoundly different from the background of the intended users. Even if this were not the case, casual introspection hardly seems an adequate basis to develop costly and widely used computer and information systems.

The programming language community has begun to take a more psychologically oriented approach to studying programmer behavior and utilization of language facilities [1-6]. Research in this area is leading to improved guidelines

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This work was partially supported by the National Science Foundation under Grants MCS-76-03142 and MCS-77-18641.

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© 1978 ACM 0362-5915/78/1200-0417 \$00.75

ACM Transactions on Database Systems, Vol. 3, No. 4, December 1978, Pages 417-439.



Thanks!

This research was supported by:
Center for Organizational Research at UCI



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