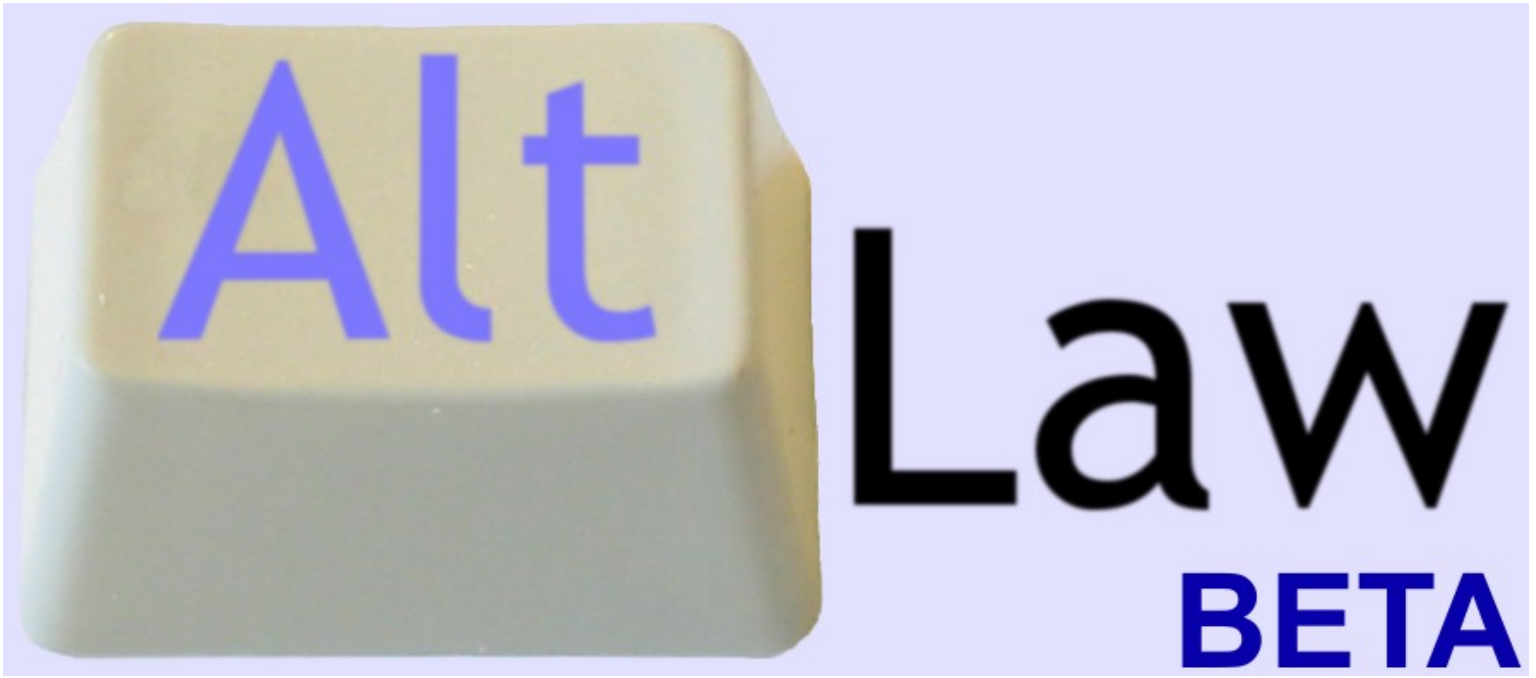
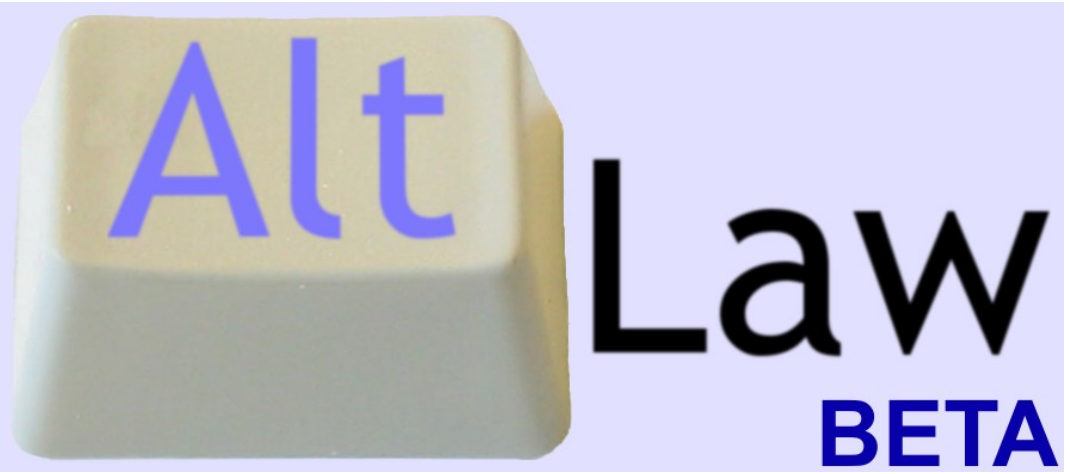


Stuart Sierra
Program on Law & Technology
Columbia Law School

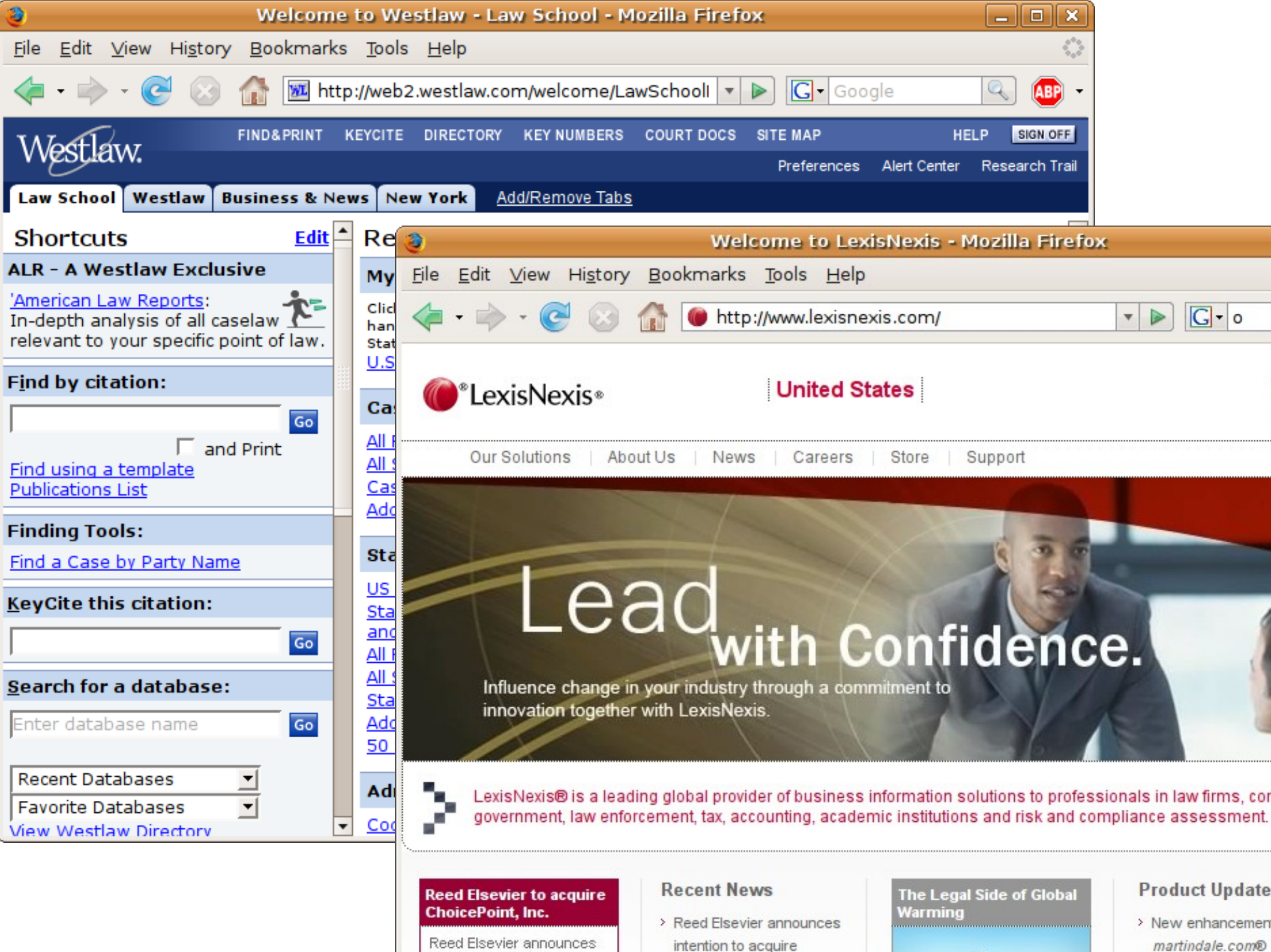
http://altlaw.org/ - the site
http://lawcommons.org/ - wiki & mailing list
http://columbialawtech.org/ - my employer

Talking Points

- AltLaw
  - History, motivation
  - Data sources
  - Back-end



- Semantic Web
  - What I've done
  - What I want
  - Problems I see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Front-end

Data Sources – Large Corpora

- Paul Ohm's corpus, http://bulk.altlaw.org/
  - 7 GB, 200,000+ files harvested from court web sites
- Cornell U.S. Code
  - 748 MB of XML
- http://bulk.resource.org/courts.gov/c/
  - 2 GB, 700,000+ federal cases, XHTML
- http://pacer.resource.org/
  - 736 GB, 2.7 million PDFs, 1.8 million HTML files

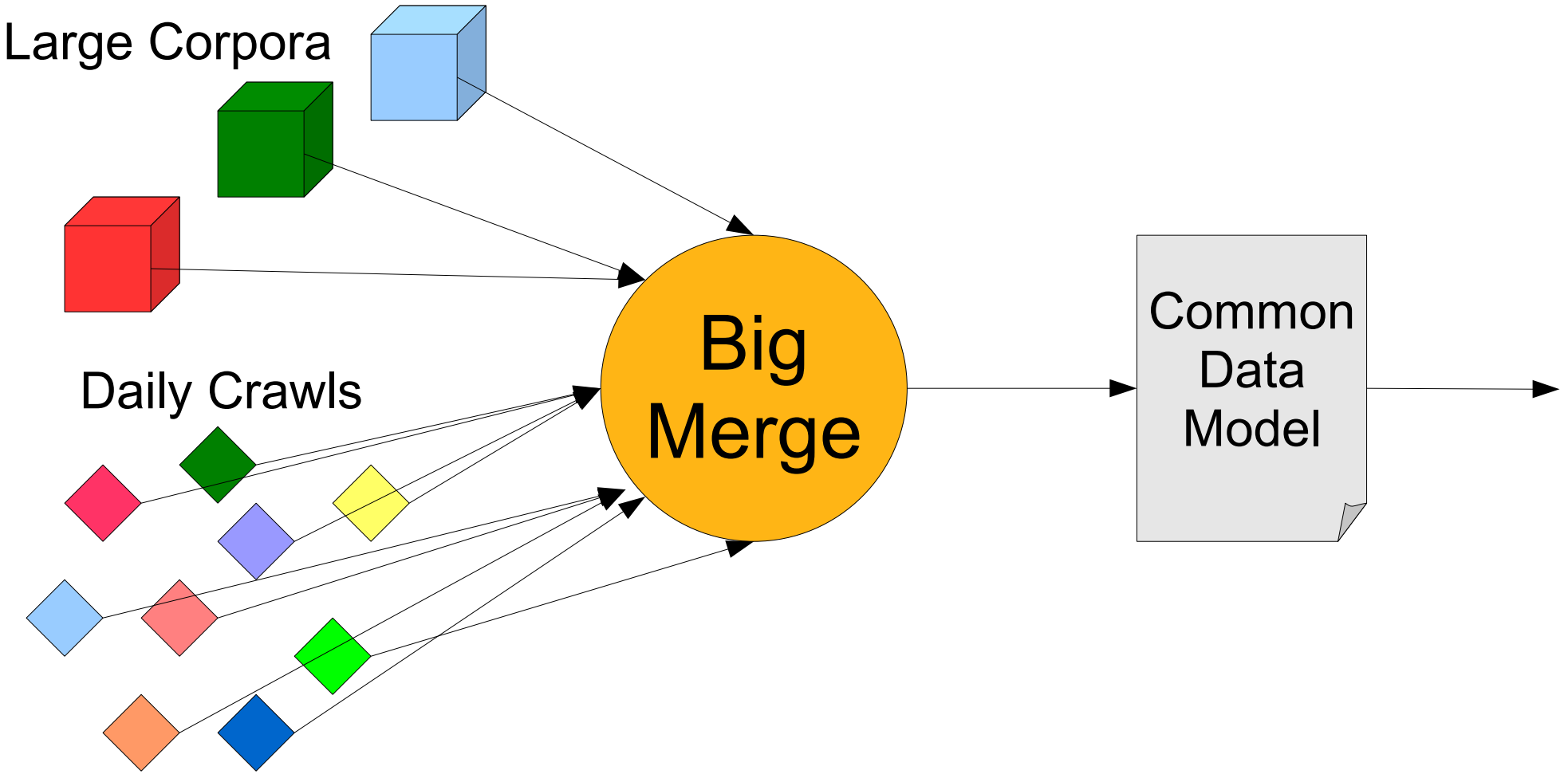
Data Sources – Court Web Sites

www.supremecourtus.gov
www.ca1.uscourts.gov
www.ca2.uscourts.gov
www.ca3.uscourts.gov
www.ca4.uscourts.gov
www.ca5.uscourts.gov
www.ca6.uscourts.gov
. . .

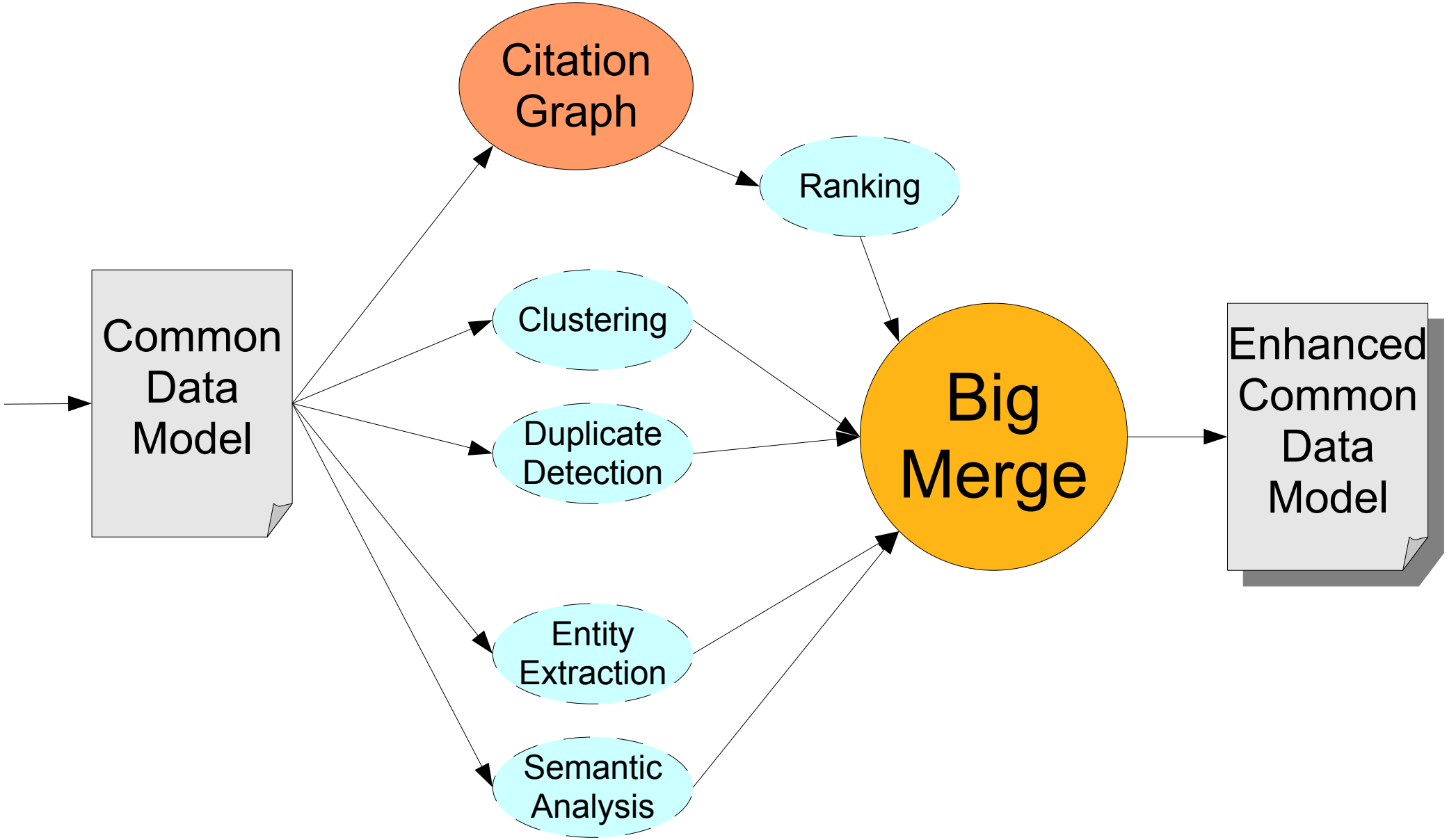
14 appeals courts total
94 district courts
?? state courts
?? local/other courts

- 20-40 new cases daily
- PDF, WordPerfect, HTML, plain text

Back-end (1)

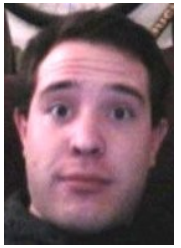


Back-end (2)


Citation Graph
Ranking
Common Data Model
Clustering
Duplicate Detection
Big Merge
Enhanced Common Data Model
Entity Extraction
Semantic Analysis

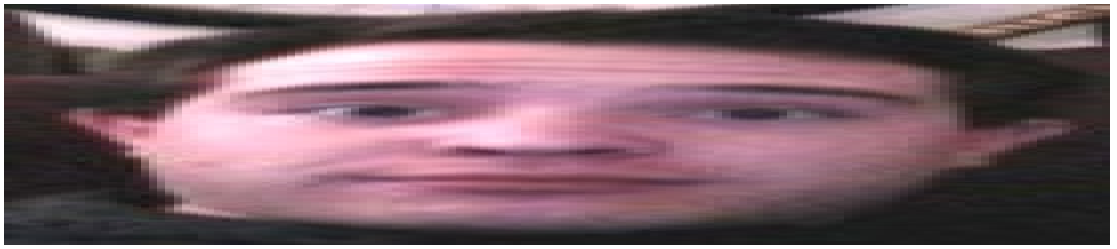
Scaling Stuart

- Java



-
- Ruby

-
- Clojure



The Grand Unified Data Model

- Key-value pairs? (files, Berkeley DB)
- Documents? (Solr/Lucene, CouchDB)
- Trees? (XML, JSON, Objects)
- Graphs? (RDF)
- Tables? (SQL)

- “Disk is the new tape.”
  - NO random access
  - NO disk seeks
  - Run at full disk transfer rate, not seek rate
- Data must be splittable
- Process each record in isolation

Secret Weapons

- Hadoop – open-source MapReduce
- Amazon EC2 – cluster by the hour
- Clojure – Lisp on the JVM
- Solr – full-text search +
  document storage;
  no SQL database!
- Ruby on Rails

The Grand Unified Data Model

- Key-value pairs? (files, Berkeley DB)
- Documents? (Solr/Lucene, CouchDB)
- Trees? (XML, JSON, Objects)
- Graphs? (RDF)
- Tables? (SQL)

Mismatch

- Hadoop
  - Disk is the new tape
  - Flat key/value files
  - Isolated records
- Solr / Lucene
  - Denormalized
  - Flat documents

- RDF
  - Normalized
  - Random access
  - Graph structure
  - Linked records

Semantic Web – What I Want

- Publish linked data for others
- Accept new data without writing new parsers/scrapers
- Richer internal data model
- Inference over multiple data sources

AltLaw on the Semantic Web

- Persistent URIs for federal courts
  - e.g. http://id.altlaw.org/courts/us/fed/app/3
  - 303 redirects to HTML/RDF
- Beginnings of an ontology
  - http://github.com/lawcommons/altlaw-vocab
  - Extension of Dublin Core & Bibliontology
- Semantic web crawler
  - Output uses “HTTP Vocabulary in RDF”

Questions

- What's in it for you?
  - How do you want my data?
    - Bulk RDF/XML downloads
    - RDFa embedded in HTML
    - SPARQL endpoint
  - What would you do with it?
- What's in it for me?
  - Universal data model
  - Less data transformation