Working with Web Archives

DSAC Presentation, Thursday January 14th

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Overview

- 1. Overview of funded projects/overview/current research projects.
- 2. Shape of our data and munging
- 3. Workflow
- 4. What could we do with library data?

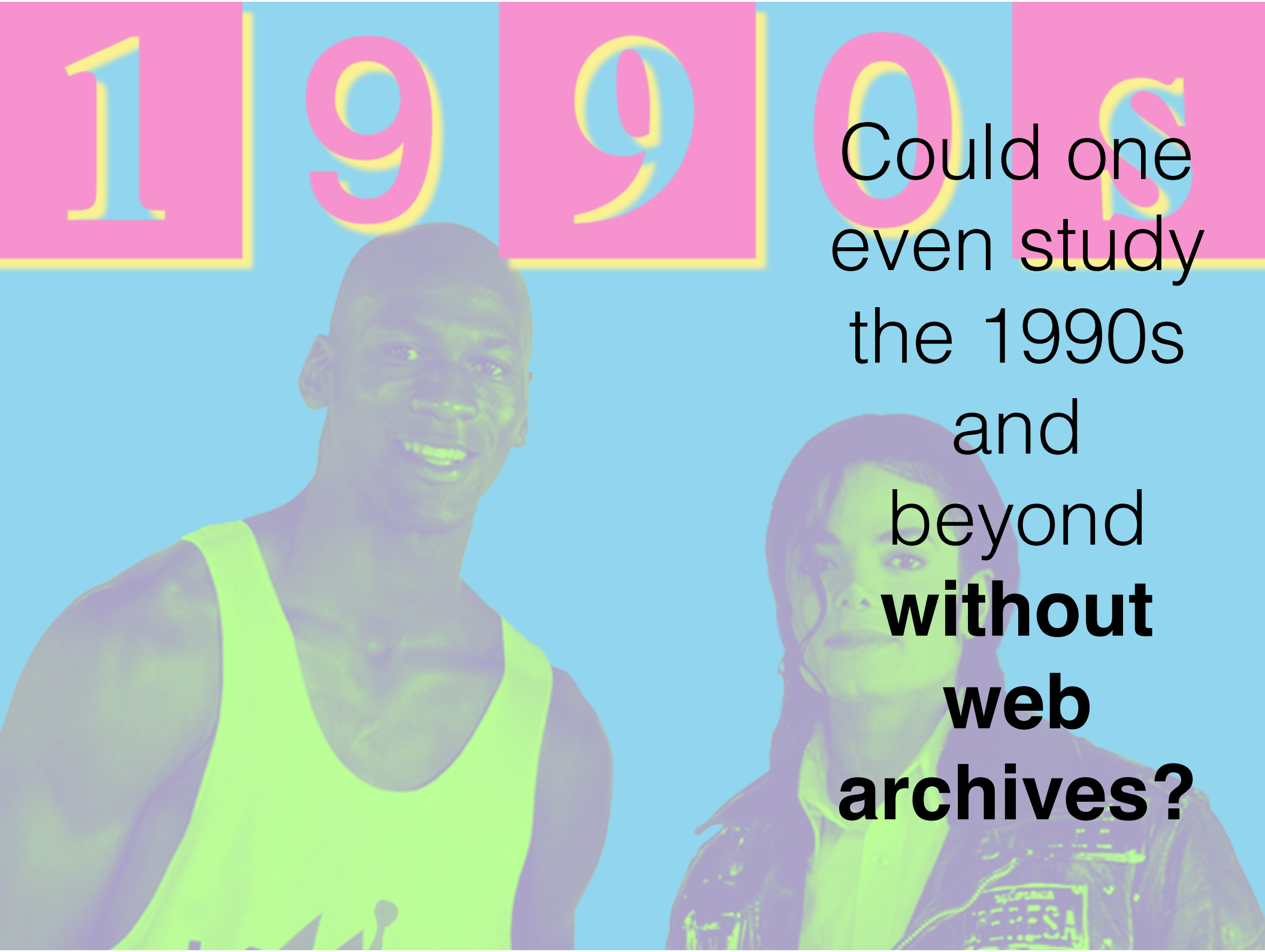
Funded Projects

- Three SSHRC Grants
  - **Insight** (2015 - 2020) [Ian Milligan, Nick Ruest & William Turkel]
  - **Insight Development Grant** (2013 - 2016) [Ian Milligan, William Turkel]
  - **Connection Grant** (2015 - 2016) [Ian Milligan, Jimmy Lin, Matthew Weber, Nathalie Casemajor]
- Ontario Ministry of Research and Innovation **Early Researcher Award** (2015 -2020) [Ian Milligan]
- Compute Canada **Research Portals and Platforms** (2016 - 2018) [Ian Milligan, Nick Ruest + University of Alberta]

Why?

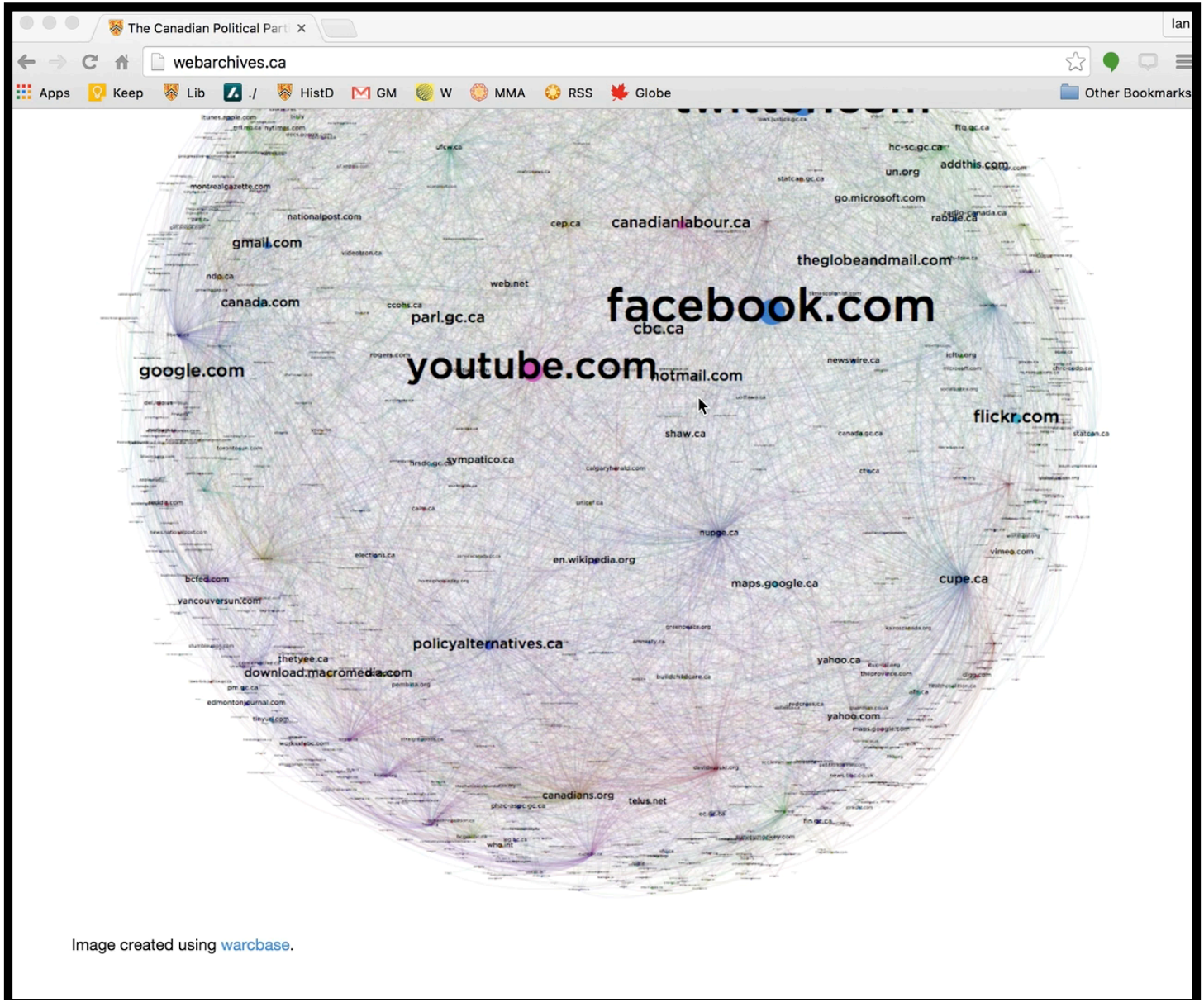
The Web as a Primary Source

- **Web archives will fundamentally affect the way historians write history**
  - We will have easier access to information on a previously-unknown scale, as well as improved capability to parse it;
  - Yet historians need to reflect on the shape that Web-based primary sources will take, and **how we will be able to access them**

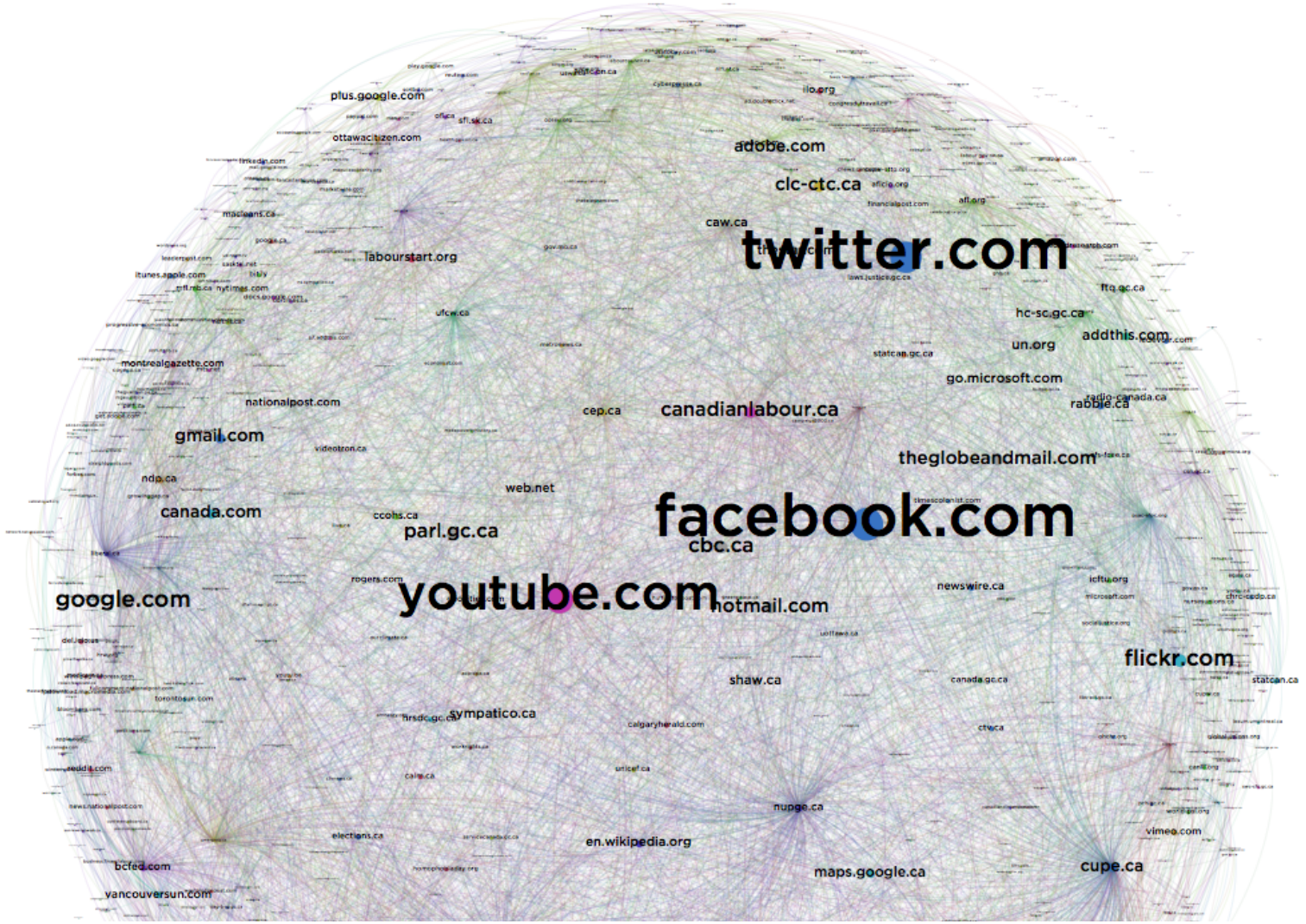

1990s
Could one even study the 1990s and beyond **without web archives?**

Early Outputs:

WebArchives.ca



Early Outputs:
warcbase/metadata analysis



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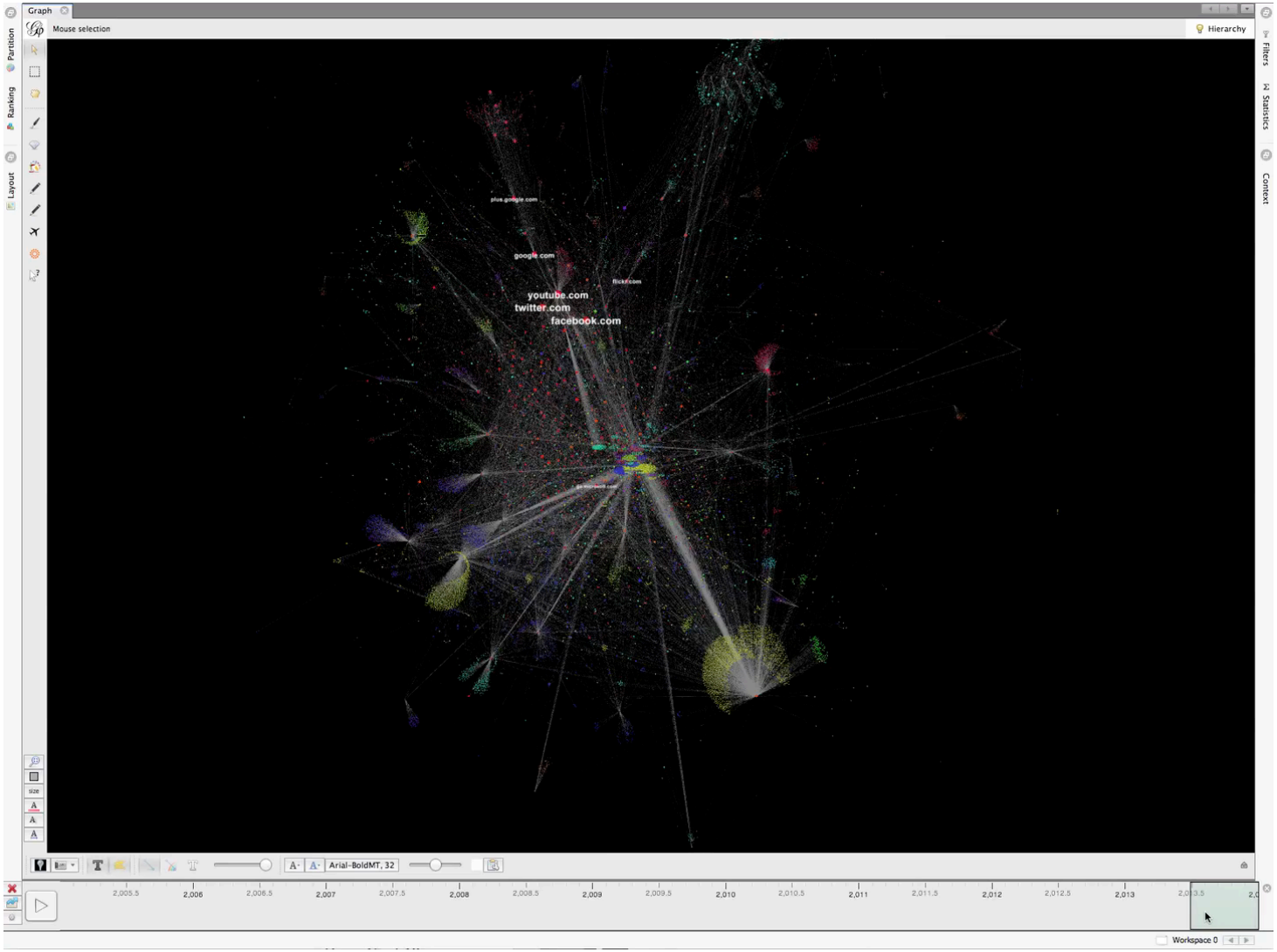
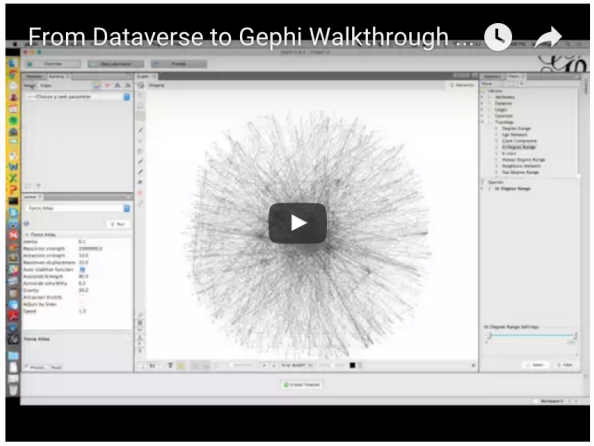


Early Outputs:
warcbase guide

Gephi: Converting Site Link

lintool.github.io/warcbase-docs/Gephi-Converting-Site-Link-Structure-into-Dynamic-Visualization/



Step One: Generate GDF Format Output

You can write directly to a Gephi-readable format by using our `WriteGDF` function. Here is an example script:

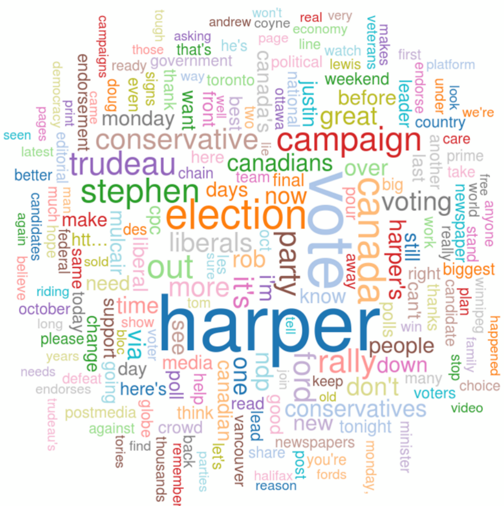
```
import org.warcbase.spark.matchbox.RecordTransformers._
import org.warcbase.spark.matchbox.{ExtractTopLevelDomain, ExtractLinks, RecordLoader, WriteGDF}
import org.warcbase.spark.rdd.RecordRDD._

val links = RecordLoader.loadArc("/collections/webarchives/CanadianPoliticalParties/arc/", sc)
  .keepValidPages()
  .map(r => (r.getCrawldate, ExtractLinks(r.getUrl, r.getContentString)))
  .flatMap(r => r._2.map(f => (r._1, ExtractTopLevelDomain(f._1).replaceAll("^\\s*www\\.", ""), ExtractTopLevelDomain(
  .filter(r => r._2 != "" && r._3 != "")
  .countItems()
  .filter(r => r._2 > 5)

WriteGDF(links, "all-links.gdf")
```

The ensuing `all-links.gdf` can be natively imported into Gephi.

Step Two: Import into Gephi

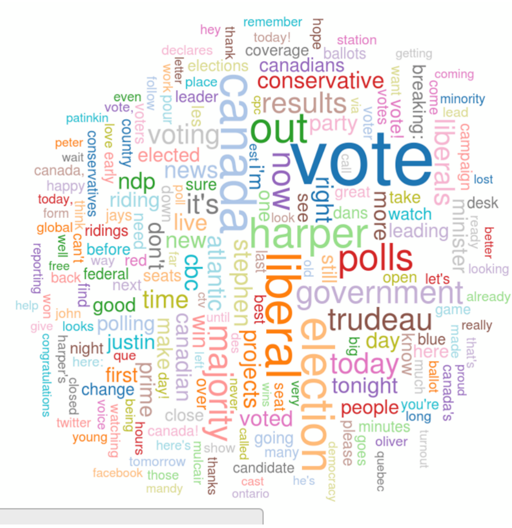
Early Outputs:
#elxn42 analysis & comprehensive check

October 17, 2015



October 18, 2015

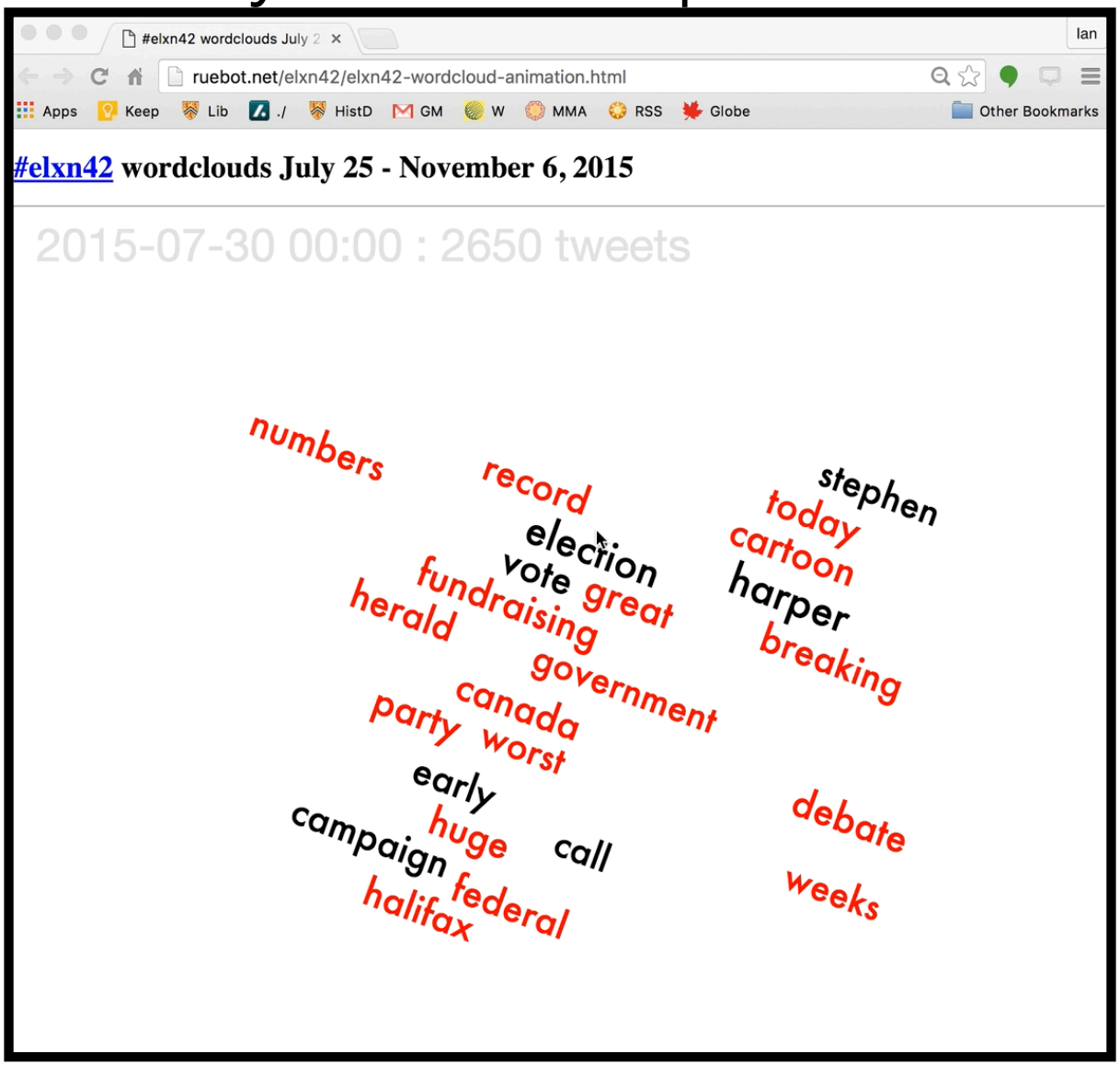
October 19, 2015



October 20, 2015

Early Outputs:

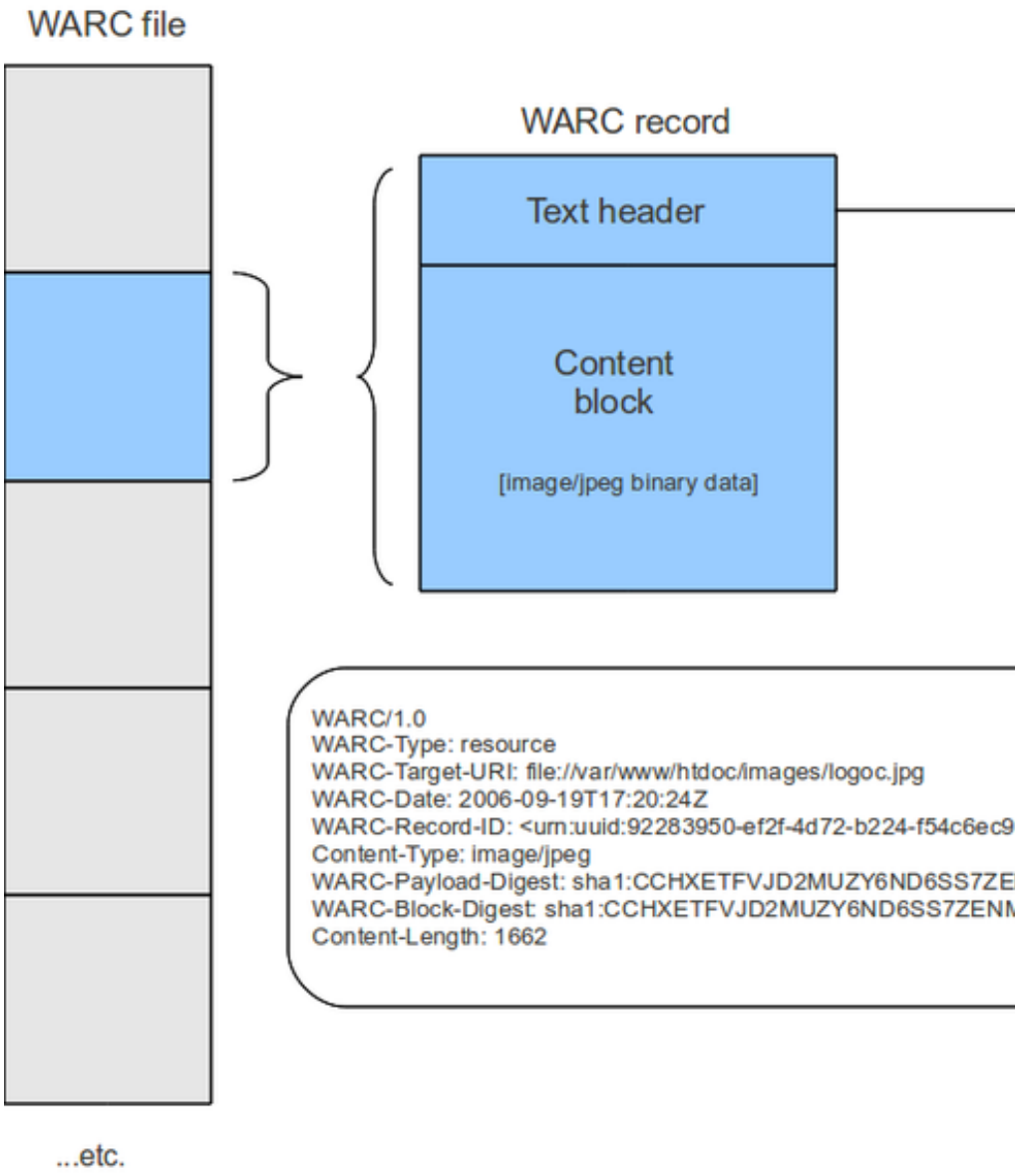
#elxn42 analysis & comprehensive check



Shape of our data?

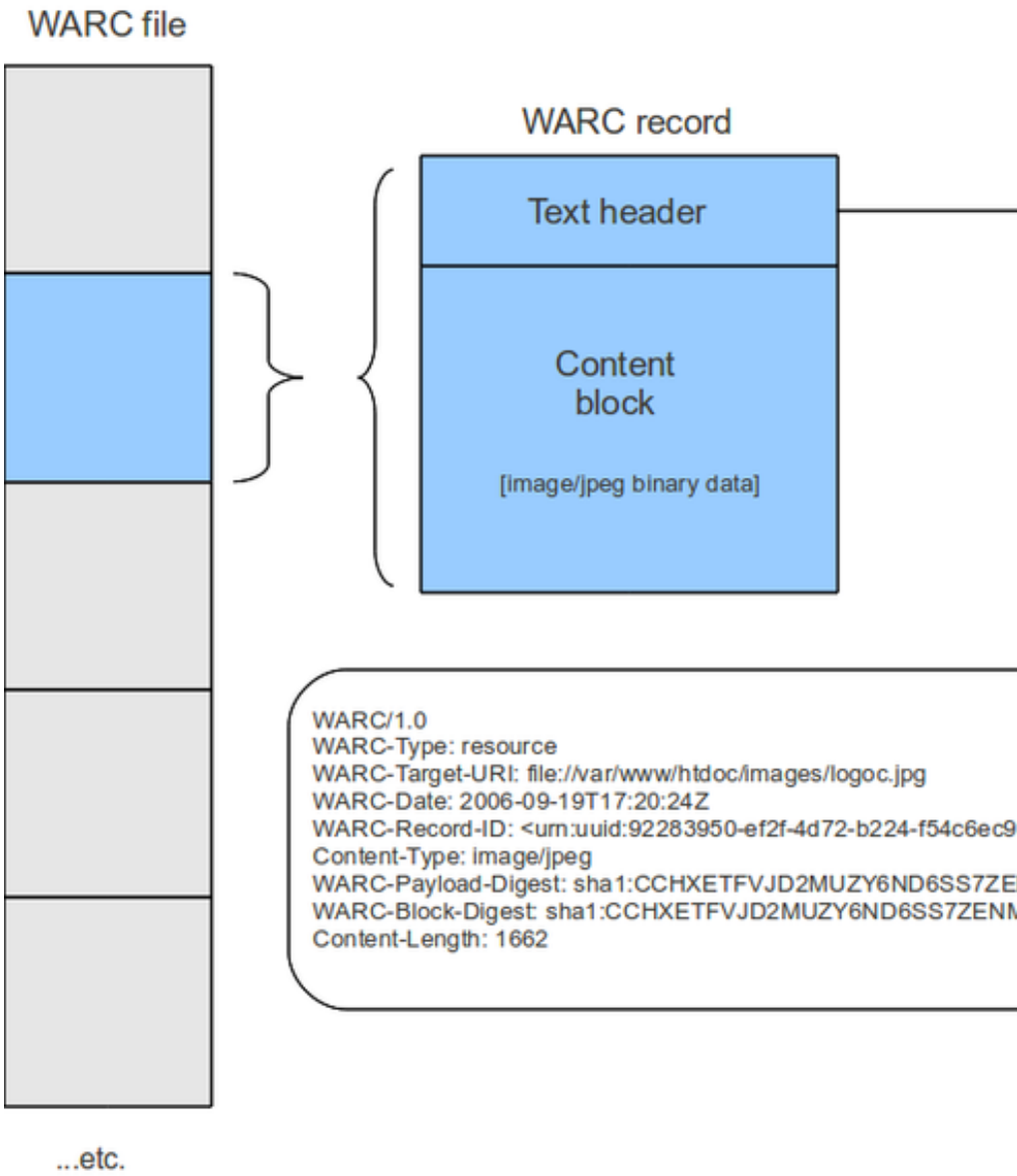
WARC File

- WebARChive Container Files (WARC), 28500:2009
- Concatenated web objects



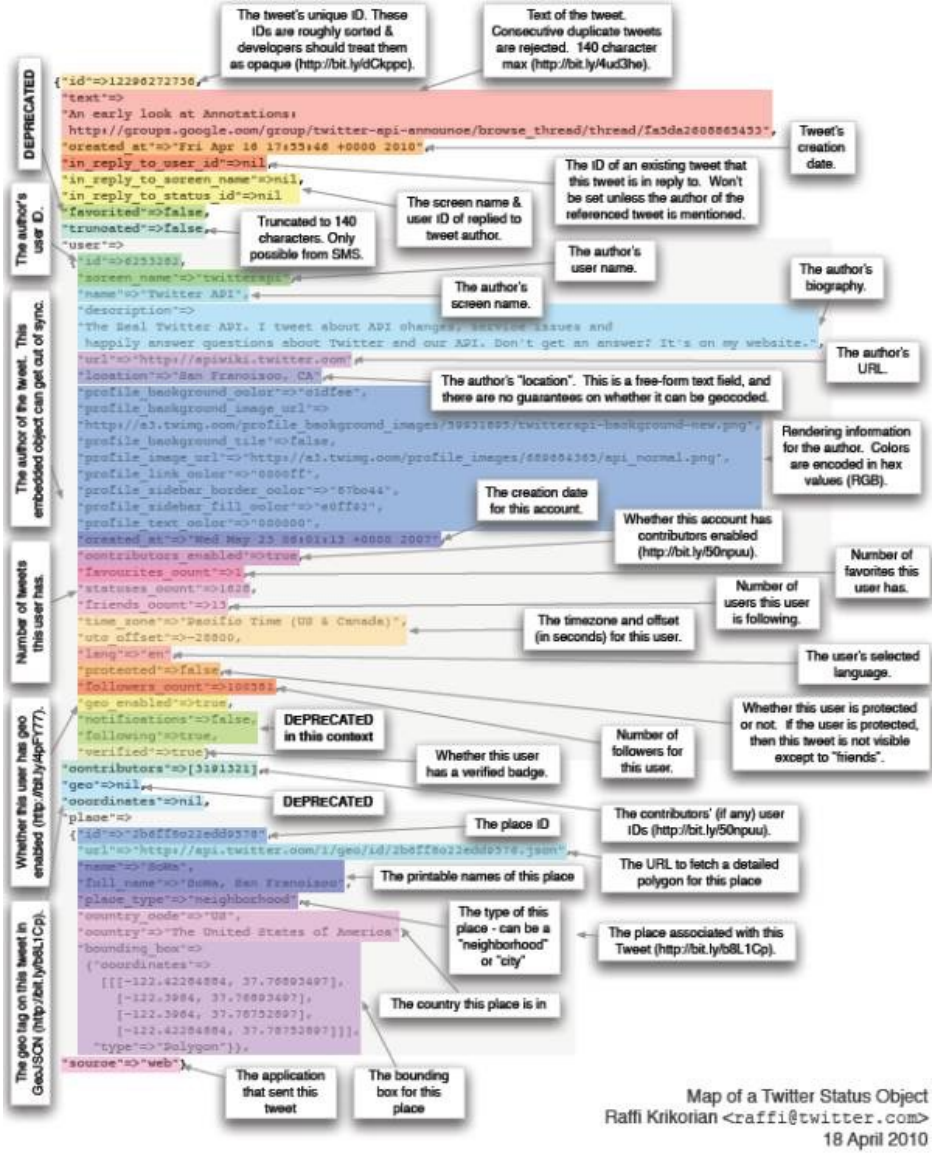
WAT File

- WARC minus content



Twitter Data

- JSON
- Collected using Twitter's Streaming API (or Search API)
- Generated ourselves or with fellow travellers like Library and Archives Canada



Data Munging

- WARC Files
  - Warcbase – from ingest, indexing, text analysis, entity extraction, etc. Based on the Spark platform.
- Twitter JSON
  - twarc (https://github.com/edsu/twarc)
  - bash scripting
  - jq (`cat elxn42-tweets.json | jq -c '.text' | cat > elxn42-tweets-text.txt`)
  - Mathematica

Workflow

- **Computing provided by York University Libraries**
- 1. Downloading or scraping data (Internet Archive via wget or sneakernet or begging)
- 2. Ingesting or indexing into visualization platform
- 3. Analytics run
- 4. Exporting in various datasets (GEXF for Gephi, TXT or CSV for textual analysis, other formats for various visualizations - i.e. NER)

Library-Provided Data?

- Internet Archive Data
- **Archive-It Data from OCUL Partners** - we would love to use this to expand our coverage in http://webarchives.ca
- **Other contemporary data** - would be interesting to link up with our web archives, find connections between web archive corpora and other datasets

Propose one or two ways that library-provided data (including Internet Archive data) could advance your work if you had a different kind of access to it or could use it with different tools than ones currently available?

One Way

- More **WARCs** from the Internet Archive
  - GeoCities
  - .ca Top-Level Domain (moon shot)
- More **WARCs** from Archive-It Partners
  - Canadian-based collections
  - Even a comprehensive list of what other non-University of Toronto partners have would be useful, currently no good search engine!

Another Way

- **Support in making datasets interoperable**
  - Could we get the index that powers webarchives.ca to speak to other databases that the library might have to offer?

Social Sciences and Humanities Research Council of Canada

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Thanks for listening!

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