

It has moving parts!

Interactive visualisations in digital publications

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Digital Scholarly Editions and Visualisations

- Digital Scholarly Editions sometimes include visualisations of the data they contain but more often than not this is limited to static visualisations
- Most commonly page images, basic charts, timelines, social networks, and extracted tables of information
- When they exist, they all use different technologies for processing and display
- Often these are fixed visualisations: readers are unable to truly change the parameters or interact with the data
- Usually these visualisations work only on the originating website, they can't easily be embedded in articles reviewing them
- Often the concentration is on the display/presentation of the editor's viewpoint and conclusions rather than exposing the data for further query or ongoing analysis by readers

Digital Data to be Extracted

- Purely digital editions sometimes present one or two visualisations to highlight the interests of those creating the editions;
- Many editors often think they have ‘only text’, not ‘data’; but the structures created by the edition contain more data than they think
- Where feasible all digital editions should at least freely expose:
 - Full copies of underlying data available at a stable URL in interchange formats like TEI XML easily addressable at word level
 - The project-specific schema, TEI ODD Customisation file, or other machine-processable schema as part of project metadata and documentation
 - Extracted data on any named entities (people, places, organizations, works, etc.)
 - Individual and combined witnesses (in multi-witness editions), and data necessary for generation of stemmata codicum
 - Wordlists of distinct (at least) orthographic words and references to them
 - Exported lists of distinct abbreviations and expansions, and references to them
 - Pre-calculated statistics on any significant markup structures
- Data such as these should be considered low-hanging fruit, easy to produce, freely available, and enable secondary studies, comparison of editions, re-use of data

The Wand'ring JEW's CHRONICLE.

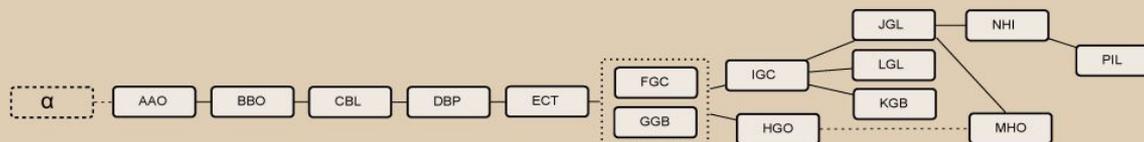
Browse

Compare

List

Thumb

Tree



Wandering Jew's Chronicle has 16 versions

[New Version](#) • [Bibliographic Info](#) • [Line Numbers:](#) • [Hide notes](#) • [Index of texts](#)

Bibliographic Information

Wandering Jew's Chronicle

Original Source

Witness List

- **Witness AAO:** The wandering Jews chronicle: OR, The old historian his brief Declaration Made in mad fashion Of each Coronation That past in this Nation Since William's Invasion For no great occasion But meer Recreation To put off vexation. To the tune of, Our Prince is welcome out of Spain. London: Printed for Francis Grove on Snow-Hill. London Francis Grove Bodleian Library, Oxford: Wood Ballads: 401 (121); ESTC: S119915
- **Witness BBO:** The Wandring Jew[s] Chronicle, Or, [The Old His]torian His brief Declaration Maid in a mad fashion of each Coronation That pass'd in this Nation Since William's Invasion For no great Occasion, But m[e]er Recreation To put off Vexation. To the Tune of, Our Prince is welcome out [...] Spain. Printed for F. Coles, T. Vere, and J. Wright. Bodleian Library, Oxford: Douce Ballads 2(240a) ESTC: R234033
- **Witness CBL:** The Wandring Jews Chronicle: OR, The Old Historian His Brief Declaration, Made in a mad fashion, of each Coronation, That pass'd in this Nation, Since William's Invasion, For no great Occasion, But meer Recreation, To put off Vexation. To the Tune of, Our Prince is welcome out of Spain. Printed for F. Coles, T. Vere, J. Wright. and J. Clark. British Library: Roxburghe Ballads Rox. III. 47 ESTC: R216016
- **Witness DBP:** The Wandring Jews Chronicle; OR, The Old Historian, His Brief Declaration, Made in a Mad Fashion, Of each Coronation, That pass'd in this Nation; Since William's Invasion, For no great occasion, But meer Recreation, To put off Vexation. Tune of, Our Prince is Welcome out of Spain. Printed for I. C[larke]. W. T[hackeray]. and T. P[assinger]. Pepys Library, Magdalene College, Cambridge: Pepys Ballads I. 482-3 ESTC: R234193.
- **Witness ECT:** The Wandring JEW's CHRONICLE: OR, A Brief History of the Remarkable Passages from William the Conqueror, to this present Reign. BEING, The old Historian, His brief Declaration, Made in a mad Fashion, Of each Coronation, That pass'd in this Nation, Since William's Invasion, For no great Occasion, But meer Recreation, To put off Vexation. To the Tune of, Our Prince is welcome out of Spain. London: Printed by and for C. Brown, and are to be sold by the Booksellers of Pye-corner and London-bridge. Harry Ransom Center, University of Texas at Austin: L.C. PR3291.A1 W364 1702 HZF.
- **Witness FGC:** The Wandring JEW's CHRONICLE: OR, A Brief History of the Remarkable Passages from William the Conqueror, to this present Reign. BEING, The old Historian, His brief Declaration, Made in a mad Fashion, Of each Coronation, That pass'd in this Nation, Since William's Invasion, For no great Occasion, But meer Recreation, To put off Vexation. To the Tune of, Our Prince is welcome out of Spain. London: Printed by and for [C. Brown?] and T. Norris and sold by [J. Walter?] at the Golden [Ball]. London Cambridge University Library: Madden Garlands vol. III ESTC: T206988.
- **Witness GGB:** The Wandring JEW's CHRONICLE: OR, A Brief History of the Remarkable Passages from William the Conqueror, to this present Reign: BEING, The old Historian, His brief Declaration, Made in a mad Fashion, Of each Coronation, That pass'd in this Nation, Since William's Invasion, For no great Occasion, But meer Recreation, To put off Vexation. To the Tune of, The Wandring Jew's Chronicle. London: Printed by T. Norris, at the Looking-glass on London-bridge. And sold by J. Walter. London T. Norris Brown University John Hay Library, Hay Broadshides 1-Size B1753 EN. Not in ESTC; variant issue of T206988

Witness 3: CBL

The Wandring Jews Chronicle:
OR, The Old Historian His Brief Declaration, Made in a mad fashion, of each
Coronation, That pass'd in this Nation, Since William's Invasion, For no great
Occasion, But meer Recreation, To put off Vexation.
To the Tune of, Our Prince is welcome out of Spain.

1 WHen ^e William Duke ^b of Normandy ⁿ
2 With all his Normans gallantly
3 this Kingdome did subdue;
4 Full fifteen years of age I was,
5 And what e're since hath come to pass,
6 I can report for true.
7 I can remember since he went
8 From London for to Conquer Kent.
9 where with a walking Wood,
10 The men of Kent compassed him,
11 And he for aye confirm'd to them
12 King Edwards Laws for good.
13 Likewise, I William Rufus knew,
14 And saw the Arrow that him slew
15 hard by a Forrest side:
16 I well could tell if I list,
17 Or better tell you if I wist,
18 who next to him did ride.
19 First Henry I, and Stephen knew,
20 Who no man here but I did view,
21 I saw them Crown'd and dead;
22 I can remember well also,
23 The second Henry's Royal show,
24 that day that he was Wed.
25 I likewise was at Woodstock Bower,
26 And saw that sweet and famous flower,
27 Queen Elenor so did spight;
28 I found the clew of thread again,
29 After that worthe Knight was slain,
30 twas green, blew, red and white.
31 I saw King Richard in his shirt
32 Pull out a furious Lyons heart,

Witness 4: DBP

The Wandring Jews Chronicle;
OR, The Old Historian, His Brief a Declaration, Made in Mad Fashion, Of each
Coronation, That pass'd in the Nation, Since Williams Invasion, For no great
occasion, But meer Recreation, To put off Vexation.
Tune of, Our Prince is welcome out of Spain.

1 WHen ^e William Duke ^b of Normandy, ⁿ
2 With all his Normans gallantly,
3 This Kingdom did subdue:
4 Full fifteen years of age I was,
5 And what e're since hath come to pass,
6 I can report for true.
7 I can remember since he went
8 From London for to Conquer Kent,
9 where in a walking Wood,
10 The men of Kent Compassed him,
11 And he for aye confirm'd to them, [IS 'N' in 'AND' TURNED TYPE OR AN
'U'?]
12 King Edwards Laws for good.

13 Likewise, I William Rufus knew,
14 And saw the Arrow that him slew,
15 hard by a Forrest side:
16 I well could tell you if I list,
17 Or better tell you if I wist,
18 who next to him did ride.

19 First Henry I, and Stephen knew,
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21 I saw them Crown'd and dead:
22 I can remember well also,
23 The second Henry's Royal show,
24 that day that he was wed.

25 I likewise was at Woodstock-Bower,
26 And saw the sweet and famous flower,
27 Queen Elinor did so spight

AAO ▾ William Conq. ▾



AAO ▾ Henry ▾



AAO ▾ Henry ▾



BBO ▾ Henry ▾



University of Oxford: Interactive Data Network

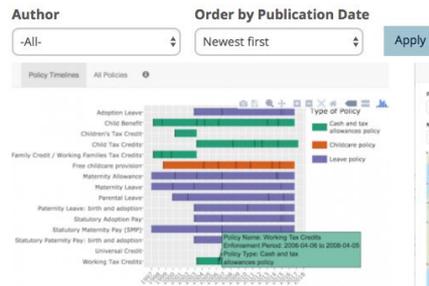
- A new service at the University of Oxford to provide support, training, and consultancy for interactive data visualisations
- visualisations built on with consistent set of standard technologies such as:
 - the R programming language
 - the Shiny web application framework
 - open source packages and plugins
 - javascript visualisation libraries
- All data and visualisation code is released openly
- visualisations hosted on shinyapps.io and hosting provided to University of Oxford members as part of the service
- Data able to be read from many different repositories (institutional, Figshare, Zenodo, Google, Zotero)
- Workshops, training materials, how-tos, reading lists, and fully working examples provided for many different forms of data as case studies
- Not really ‘digital editions’ as we usually perceive them but DSEs should embed visualisations like this

► [Visualisation Showcase](#)

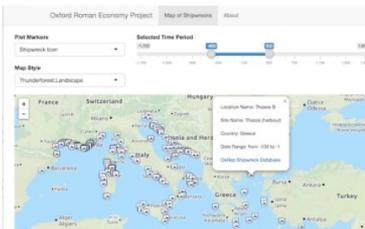
Visualisation Showcase

This is a showcase of the interactive data visualisations built by members of the IDN as case studies for the Live Data Project, mostly built through 2016. Almost all of the examples below were built using [R](#) and [Shiny](#). Details about the research behind the data, the [data repositories hosting the data](#), and the researchers themselves are available by clicking on a visualisation of choice.

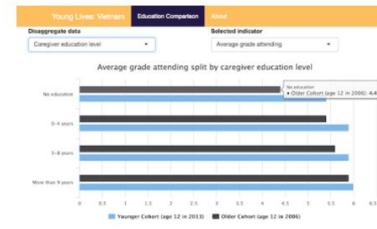
If you're interested in working with the IDN on a similar case study do [get in touch](#), have a look at [our templates and tutorials](#) and read about the [Oxford University funded shinyapps.io subscription](#).



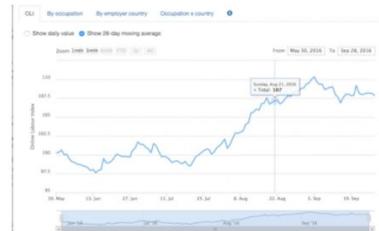
Family Policy Timelines Case Study
29 Sep 2016



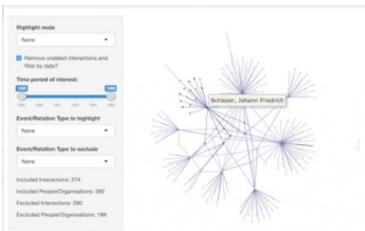
Oxford Roman Economy Project Case Study
29 Sep 2016



Young Lives Case Study
29 Sep 2016



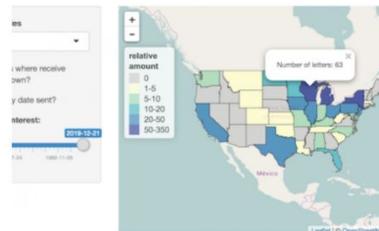
Online Labour Index Case Study
21 Sep 2016



Cultures of Knowledge Case Study
18 Sep 2016



Hepitopes Database Case Study
18 Sep 2016



German Migrant Letters
18 Feb 2016



Irish Surgeons in India
18 Feb 2016

IDN Modular Infrastructure

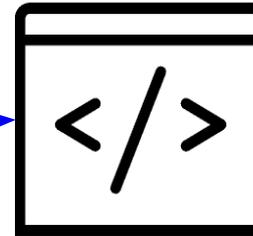


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Articles > Irish Surgeons in India

Irish Surgeons in India

18 February 2016 | Kieran Fitzpatrick (History of Medicine)

Kieran Fitzpatrick studies the lives of Irish medical practitioners in the British Empire from 1880-1920, particularly those who worked in India. Kieran approached the Live Data project team about creating an interactive map to visualise this data to accompany his publications and conference presentations, this case study demonstrated that the interactivity provided by Shiny is not necessary for some visualisations.

Irish enlistees to the Indian Medical Service: case study in "Processes of (Professional) Identification", visualised in an interactive map

Irish Surgeons in 19th Century India

R Pubs brought to you by | Dublin

Irish Surgeons

Irish Surgeons

This map contains the birth locations of several hundred Irish-born surgeons who later moved to India.

The interactivity provided is as follows:

- Pan and zoom with the cursor/trackpad
- Zoom with the +/- buttons
- Click points to get information on the number of births at the location

Irish Surgeons | by Martin Haidley | Last updated 8 months ago

Case Study Details

Department	History of Medicine
Academics	Kieran Fitzpatrick
Division	Humanities
Link(s) to visualisations	https://rpubs.com/martinhaidley/Irish-Surgeons
Where is visualisation used?	https://talks.ox.ac.uk/talks/gd/31094c6f-1019-453c-996c-989445fc3660/
Data Source	Figshare DOI
Link(s) to code	https://github.com/ox-ic/OxfordIDN_Case-Studies/tree/gf-pages/2016/IrishSurgeons-in-India
Developer	Martin Haidley

Case Study Overview

Kieran studies Irish surgeons in India and wanted a map. Built a demo in RMarkdown and this was sufficient, a future project to build an interactive shiny app is planned for the future.

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Cultures of Knowledge Case Study

- Cultures of Knowledge: Networking the Republic of Letters, 1550-1750
- CoK uses digital methods & interactive visualisations to reassemble & interpret the early modern correspondence networks
- Mellon-funded project running since 2009
- Created Early Modern Letters Online (EMLO) as a union catalogue of sixteenth-, seventeenth-, and eighteenth-century correspondence
- This case study visualised a subset of 1695 individuals correspondences from the EMLO dataset, stored in the FigShare repository
- Uses social network diagrams and datatables of extracted information
- This was used as part of an EU COST Network Workshop
- More: <http://idn.web.ox.ac.uk/article/cultures-knowledge-case-study>



Visualizations of the Prosopographical Network of Samuel Hartlib

The graph below shows the whole network and how it is interconnected. People are rendered in purple, organizations in green. The controls on the left allow you to search for a particular person or organization within the network and/or to select a date (range). The last name of a person is shown below their node; positioning the cursor over the node displays their full name. The thickness of an edge (i.e. the line between two nodes) represents the number of connections between two people or organisations. The controls on the left allow you to highlight and/or exclude a specific relationship type.

Clicking on a node highlights the individuals or organizations directly connected to the selected individual reveals a box showing the number and type of unique connections as well as a table with all events involving the selected individual. In the network graph, you can only select one individual at a time. You can deselect by clicking in the empty space between the nodes.

Hover your cursor over the controls for more information

Highlight node

None

Remove undated interactions and filter by date?

Event/Relation Type to highlight

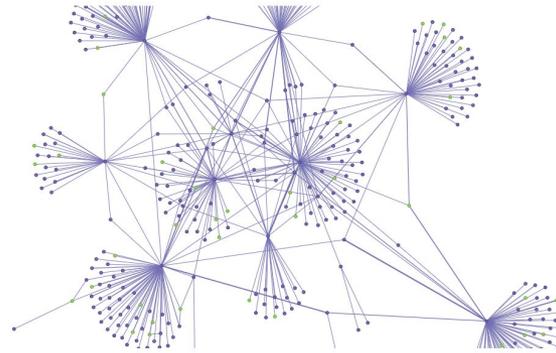
None

Event/Relation Type to exclude

None

Included Interactions: 554
 Included People/Organisations: 392
 Excluded Interactions: 0
 Excluded People/Organisations: 0

Selected Person/Organisation: [Haak, Theodor](#)
 Number of Unique Connections: 68
 Scroll down for more information about Haak, Theodor's connections



The default columns show the most basic information. Columns with additional information, including the source of the data, can be added to the list by selecting them from the list that appears when you click in the 'Columns to show' box. To remove a column, click on the name of the column and press the 'Delete' or 'Backspace' key. The free-text search box allows you to search for any information within the data concerning the selected individual. You can also search per column in the search boxes below the columns.

Columns to show:

Category Event.or.Relationship.Type Primary.Participant.Name Primary.Participant.Role Secondary.Participant.Name Secondary.Participant.Role DateOne.Year DateTwo.Year Date.Type Location.Type.Ahead

Show 25 entries

Search:

Category	Event or Relationship Type	Primary Participant Name	Primary Participant Role	Secondary Participant Name	Secondary Participant Role	DateOne Year	DateTwo Year	Date Type	Location Type Ahead
BasicData	FamilyRelationships	Haak, Theodor	Son	Haak, Theodor, father of Theodor Haak (1805-1890)	Father				-
BasicData	FamilyRelationships	Haak, Theodor	Son	Tossanus, Maria	Mother				-
Education	Study	Haak, Theodor	Student	Heidelberg University	AcademicInstitution	1625		Before	Heidelberg, Baden-Württemberg, (Electoral Rhenisch Imperial Circle) Germany, (Holy Roman Empire)
Education	Study	Haak, Theodor	Student	Gloucester Hall, Oxford	AcademicInstitution	1628	1631	Duration	Gloucester Hall, University of Oxford, Oxford, Oxfordshire, England
Education	Study	Haak, Theodor	Student	Allen, Thomas	Teacher	1628	1631	Between	Gloucester Hall, University of Oxford, Oxford, Oxfordshire, England
Education	UniversityMatriculation	Haak, Theodor	Matriculant	Leiden University	AcademicInstitution	1638			Leiden, South Holland, Netherlands
SocialContacts	FirstContact	Haak, Theodor	Acquaintance	Hartlib, Samuel	Acquaintance	1634		Before	-
SocialContacts	Correspondence	Haak, Theodor	Correspondent	Mersenne, Marin	Correspondent				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Pell, John	Acquaintance				-
SocialContacts	Travel	Haak, Theodor	TravelCompanion	Pell, John	TravelCompanion	1654	1656	Duration	-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Wallis, John (Dr)	Acquaintance				-
ProfessionalsActivity	Employment	Haak, Theodor	Secretary	Charles I Louis, Elector Palatine	Employer	1644	1649	Duration	-
BasicData	FamilyRelationships	Haak, Theodor	Husband	Genue, Elisabeth (d. 1669)	Wife	1656			-
LearnedActivity	MembershipOfALearnedOrganisation	Haak, Theodor	Member	The Royal Society	LearnedOrganisation	1663		After	-
LearnedActivity	CreationOfWorkActivity	Haak, Theodor	Translator	Milton, John	Author				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Milton, John	Acquaintance				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Hooke, Robert	Acquaintance				-
BasicData	FamilyRelationships	Haak, Theodor	Cousin	Spanheim, Friedrich	Cousin				-
LearnedActivity	CreationOfWorkActivity	Haak, Theodor	Translator	Dykes the Elder, Daniel	Author				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Weckherlin, Georg Rudolph	Acquaintance				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Komensk_, Jan Amos	Acquaintance				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Gronovius, Johann Frederick	Acquaintance				-
SocialContacts	Meeting	Haak, Theodor	Participant	Christian IV, King of Denmark and Norway	Participant				-
SocialContacts	Acquaintanceship	Haak, Theodor	Acquaintance	Boyle, Robert	Acquaintance				-
LearnedActivity	CreationOfWorkActivity	Haak, Theodor	Translator	Schloer, Friedrich	Author	1633			-

Showing 1 to 25 of 61 entries

German Migrant Letters Case Study

- Interactive visualisation of the correspondence network between German migrants in the 19th and 20th Century
- Tracking correspondence networks, specifically geolocation of the sender and recipient provides data for:
 - USA choropleth map
 - Letter routes (sender and destination addressee)
 - Migrant family locations in Germany
- Filter by date, toggle individual families
- Publication arising from and embedding the visualisation: “*Writing home: how German immigrants found their place in the US*”
 - Had thousands of tracked article reads in handful of months
 - Some readers citing the visualisations as what convinced them to contact the researcher to get the underlying data
 - Maps used as convincing aspects of a (now accepted) book proposal (and more visualisations will accompany the book)
- More: <http://idn.web.ox.ac.uk/article/german-migrant-letters>

German Migrant Letters

18 February 2016 *Felix Krawatzek (Politics and International Relations)*

This case study is an interactive visualisation of the correspondance network between German migrants in the 19th and 20th Century, primarily in the Americas. The case study comprises of three Shiny apps that provide an overview of how the migrant population dispersed over time using plotly cartograms.

Writing home: how German immigrants found their place in the US through the 19-20th Centuries, visualised with interactive maps

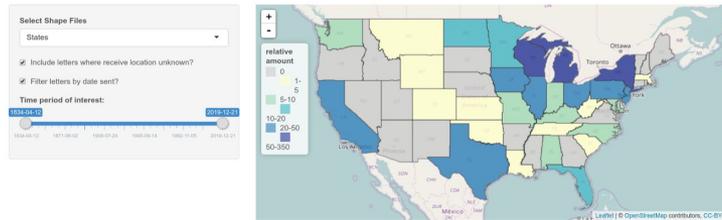
[USA choropleth](#) [Letter routes](#) [Migrant family locations in Europe](#)

Writing home: how German immigrants found their place in the US

This map displays the origins of a subsample of 1,000 letters used for the research project "Political Remittances: Understanding the Political Impacts of Migration". The project is funded through the Levenshaine Trust (Ref No: RPO-338) and based at the University of Oxford, Department of Politics and International Relations. The research conducted by Gwendolyn Sasse and Felix Krawatzek uses a total collection of 6,000 letters sent between the US and Germany between around 1830 and 1970. Permission to use the collection has been granted by Prof. Ursula Lehmann, University of Trier, and the Research Library Gotha.

The right-hand side column displays the different places from which letters of a particular series were sent. You can unselect any single or multiple series by clicking on the name of the series. You can also get an understanding of the frequency of letters over time by clicking the above "Filter letters by date sent". An article in [The Conversation](#) allows you to gain some insight into the research linked to this visualisation.

Note that this map is a first working version on ways to visualise the overall corpus. Any comments or suggestions you may have are very welcome. Please get in touch with felix.krawatzek(at)politics.ox.ac.uk.



Case Study Details

Department	Department of History
Academics	Felix Krawatzek (http://orcid.org/0000-0002-1108-6087)
Division	Humanities
Link(s) to visualisations	https://ivedataoxford.shinyapps.io/german-letters_Conversation_EuropeMap https://ivedataoxford.shinyapps.io/german-letters_Coveration_EmbedWorldMap https://ivedataoxford.shinyapps.io/german-letters_USA-Choropleth
Where is visualisation used?	The Conversation
Data Source	Figshare DOI
Link(s) to code	https://github.com/ox-it/OxfordIDN_Case-Studies/tree/gh-pages/2016/German-Migrant-Letters
Developer	Martin Hadley

Case Study Overview

Felix approached us about building this visualisation, he wanted to be able to show a number of things; Choropleth, USA/Europe locations and letter routes.



634 Articles

Reads

Type to filter results

more dangerous routes across the med

[Franck Düvell](#), March 29, 2016

2

#124 World's first three-parent baby raises questions about long-term health risks **4,876**

[Joanna Poulton](#), September 28, 2016

3

#125 Writing home: how German immigrants found their place in the US **4,800**

[Gwendolyn Sasse](#), [Félix Krawatzek](#), February 18, 2016

4

#126 The amazing camera that can see around corners **4,750**

[Claire Vallance](#), December 7, 2015

0

#127 How should we plan the cities of tomorrow? **4,506**

[Michael Keith](#), [Nicholas Simcik Arese](#), [Andreza de Souza Santos](#), October 18, 2016

0

#128 What makes us scratch an itch? **4,465**

Writing home: how German immigrants found their place in the US [Go to Article](#)

[Gwendolyn Sasse](#), [Félix Krawatzek](#), February 18, 2016



4,800 Reads



4 Comments



4 Publishers

READS OVER TIME

Scale:



1 Jan 2017 - :
13 Reads

PUBLISHERS

	Reads
View external	3,798
View external	18
View external	14
View external	1

READER LOCATION

United States	2,954
United Kingdom	590
Germany	209
Australia	187
Canada	140
France	57
India	46

Oxford Roman Economy Project Case Study

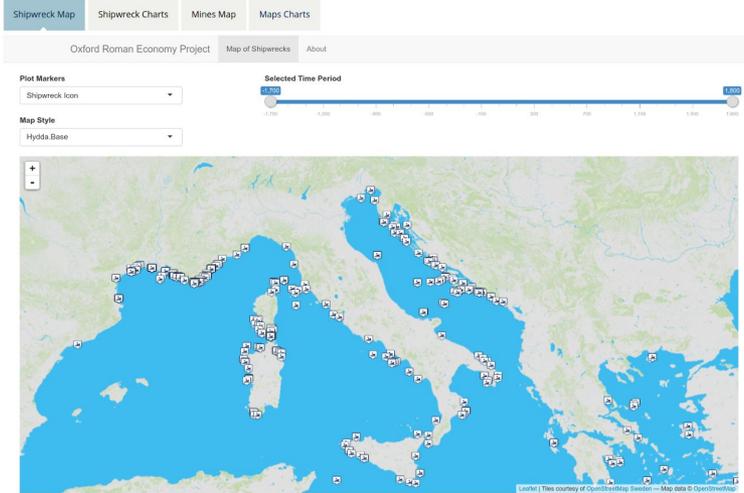
- The Oxford Roman Economy Project aims to study and curate the fundamentals of the Roman imperial project across all major economic activities.
- This case study sought to investigate the cartographic and comparative visualisation capabilities of Shiny as a tool for exploring two subsets of the OxRep database - shipwrecks and mines.
- You can filter maps and charts by date, on charts you can:
 - Group by country / province / mine name
 - Count by metals / mining techniques / number of mines
 - Stack by percent / number of mines
- Underlying OxREP databases are currently being reformulated but visualisations are planned on their databases of the Karanis Tax Rolls; Roman Mines; Olive Oil and Wine Presses; Shipwrecks; Stone Quarries; Water Technology, with more in the works.
- More: <http://idn.web.ox.ac.uk/article/oxford-roman-economy-project-case-study>

Oxford Roman Economy Project Case Study

29 September 2016 *Angela Trentacoste (Classics)* *Nicholas Ray (Classics)*

The Oxford Roman Economy Project is funded through the generosity of Baron Lorne Thyssen, previously the AHRC, to study and curate the fundamentals of the Roman imperial project across all major economic activities. This case study sought to investigate the cartographic and comparative visualisation capabilities of shiny as a tool for exploring two subsets of the OxRep database - shipwrecks and mines.

OxRep aims to make its vast database of Roman coins explorable through maps & charts. This case study looks at coins from shipwrecks & mines 95



Case Study Details

Department	Faculty of Classics
Academics	Angela Trentacoste Nicholas Ray
Division	Humanities
Link(s) to visualisations	https://ivedataoxford.shinyapps.io/OxRep_charts_mines/ https://ivedataoxford.shinyapps.io/OxRep_charts_shipwrecks/ https://ivedataoxford.shinyapps.io/OxRep_maps_mines/ https://ivedataoxford.shinyapps.io/OxRep_maps_shipwrecks/
Where is visualisation used?	Young Lives website
Data Source	OxRep Database
Link(s) to code	https://github.com/ox-it/OxfordIDN_Case-Studies/tree/gh-pages/2016/Oxford-Roman-Economy-Project
Developer	Martin Hadley

Case Study Overview

Young Lives wanted to add new interactive visualisations to their existent database, the interactive maps and charts provided a novel way for users to explore their data.

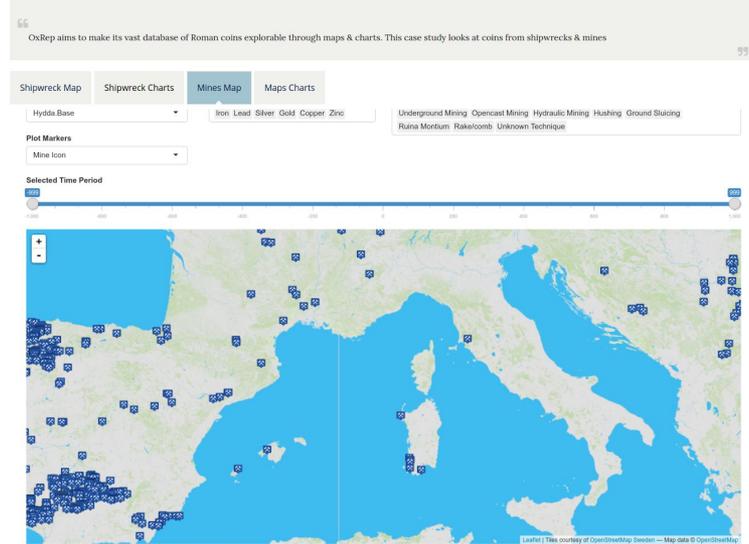


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Oxford Roman Economy Project Case Study

29 September 2016 *Angela Trentacoste (Classics)* *Nicholas Ray (Classics)*

The Oxford Roman Economy Project is funded through the generosity of Baron Lorne Thyssen, previously the AHRC, to study and curate the fundamentals of the Roman imperial project across all major economic activities. This case study sought to investigate the cartographic and comparative visualisation capabilities of shiny as a tool for exploring two subsets of the OxRep database - shipwrecks and mines.



Case Study Details

Department	Faculty of Classics
Academics	Angela Trentacoste Nicholas Ray
Division	Humanities
Link(s) to visualisations	https://livedataoxford.shinyapps.io/OxRep_charts_mines/ https://livedataoxford.shinyapps.io/OxRep_charts_shipwrecks/ https://livedataoxford.shinyapps.io/OxRep_maps_mines/ https://livedataoxford.shinyapps.io/OxRep_maps_shipwrecks/
Where is visualisation used?	Young Lives website
Data Source	OxRep Database
Link(s) to code	https://github.com/ox-ci/OxfordIDN_Case-Studies/tree/gh-pages/2016/Oxford-Roman-Economy-Project
Developer	Martin Hadley

Case Study Overview

Young Lives wanted to add new interactive visualisations to their existant database, the interactive maps and charts provided a novel way for users to explore their data.

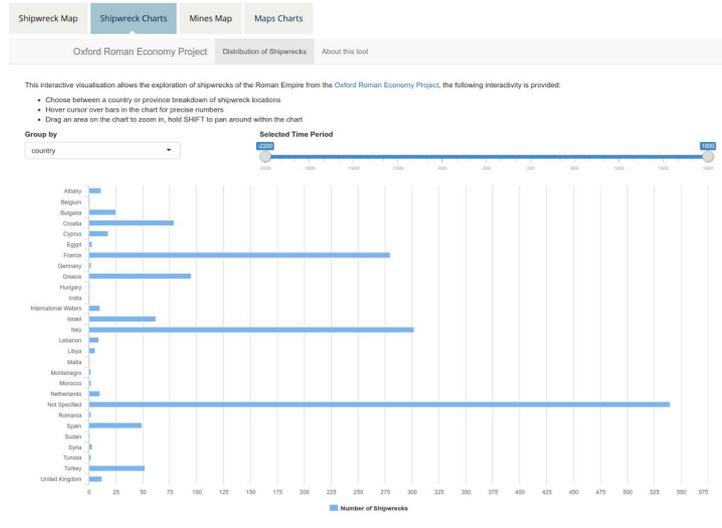


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OxRep aims to make its vast database of Roman coins explorable through maps & charts. This case study looks at coins from shipwrecks & mines



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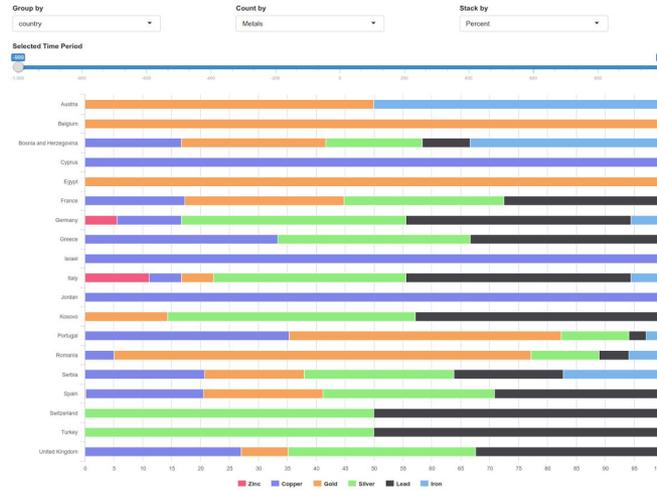
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Shipwreck Map Shipwreck Charts Mines Map **Maps Charts**

This interactive visualisation explores the Oxford Roman Economy Project's Mines Database. The following interactivity is provided:

- Choose between a country or provincial breakdown of mine locations
- Hover cursor over bars in the chart for precise numbers



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Online Labour Index Case Study

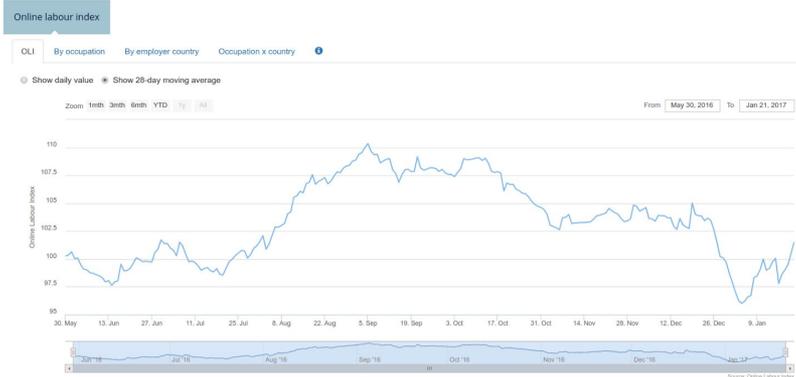
- The Online Labour Index (OLI) is the first economic indicator that provides an online gig economy equivalent of conventional labour market statistics
- It measures the utilization of online labour across countries and occupations by tracking the number of projects and tasks in real time
- This case study sought to provide an interactive dashboard for tracking the change in the OLI overtime and broken down by occupation and worker location
- It provides timeline graphs filterable by date, occupation, country, and a stacked chart able to be grouped by top 5 or 25 countries and occupation
- As a result the data was used in a Guardian Newspaper article
- More: <http://idn.web.ox.ac.uk/article/online-labour-index-case-study>

Online Labour Index Case Study

21 September 2016 *Vili Lehdonvirta (Oxford Internet Institute)* *Otto Kässi (Oxford Internet Institute)*

The Online Labour Index (OLI) is the first economic indicator that provides an online gig economy equivalent of conventional labour market statistics. It measures the utilization of online labour across countries and occupations by tracking the number of projects and tasks in real time. This case study sought to provide an interactive dashboard for tracking the change in the OLI overtime and broken down by occupation and worker location.

“Online jobs in gig economy growing fast, finds the new Online Labour Index - visualised interactively over time, gig sector and worker location.”



Case Study Details

Department	Department of History
Academics	Vili Lehdonvirta (http://orcid.org/0000-0002-6509-1703) Otto Kässi
Division	Humanities
Link(s) to visualisations	https://livedataoxford.shinyapps.io/OnlineLabourIndex/
Where is visualisation used?	ILabour Project Guardian Article
Data Source	Figshare DOI
Link(s) to code	https://github.com/ox-it/OxfordIDN_Case-Studies/tree/gh-pages/2016/OnlineLabourIndex
Developer	Martin Hadley (http://orcid.org/0000-0002-3039-6849)

Case Study Overview

ILabour dashboard under heavy usage.



Releasing Code and Data Openly

- Where possible everything is released openly with CC (or similar) license:
 - R code for the Shiny app
 - Data underlying the visualisation
 - Templates for how to create this visualisation for yourself
- Who can display the visualisation is not controlled, this means that:
 - The academic can display it in their project's webpages
 - And their department/college website (with no extra effort)
 - Reviewers can embed it in the review
 - National press can embed it in online articles
- Interactive visualisations help to bridge the data gap by giving human understandable views on the data that are able to be manipulated but also linking back to that data to enable those interested to find it
- Increasingly funding bodies are insisting the publications from their funded research publish the data that leads to the conclusion (and thus data journals are appearing and can be the data source for visualisations)

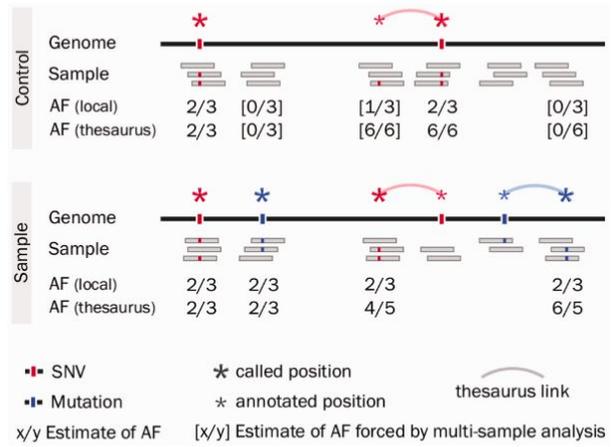
Oxford University Press: DataViz Project

- Joint project between Interactive Data Network and OUP
- Aim is to enable publication of interactive visualisations in OUP journal articles in a sustainable manner
- Paper as case study:
 - **Paper Title:** [Comparison of genetic variants in matched samples using thesaurus annotation](#)
 - **Authors:** [Tomasz Konopka](#), [Sebastian M.B. Nijman](#)
 - **DOI:** doi.org/10.1093/bioinformatics/btv654
 - **Data Deposit:** <https://dx.doi.org/10.6084/m9.figshare.4555441.v1> (all data within these visualisations is made available here)
 - **Visualisation Developer:** [Martin John Hadley](#)
 - **Motivation:** Calling changes in DNA, e.g. as a result of somatic events in cancer, requires analysis of multiple matched sequenced samples. Events in low-mappability regions of the human genome are difficult to encode in variant call files and have been under-reported as a result. However, they can be described accurately through thesaurus annotation—a technique that links multiple genomic loci together to explicate a single variant.
- Creating policies for issues such as how best to embed the visualisation, ongoing maintenance for these, and whether it should be permanently interactive (or only for a set number of years, replaced with static image later)

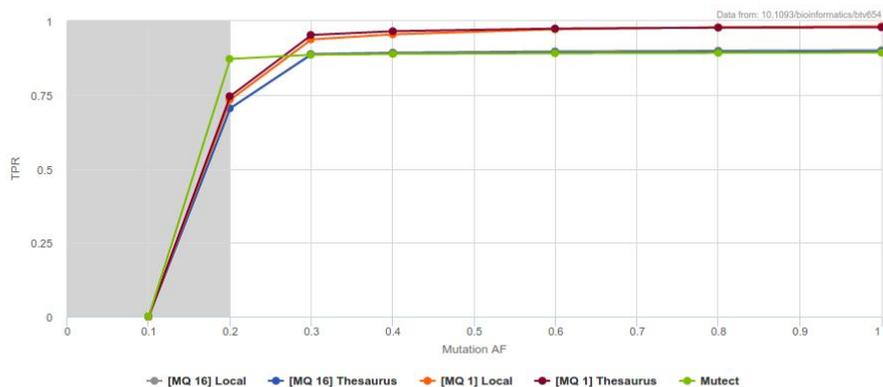
Where Does the Data Live?

For the Interactive Data Network we are exploring a wide variety of data sources:

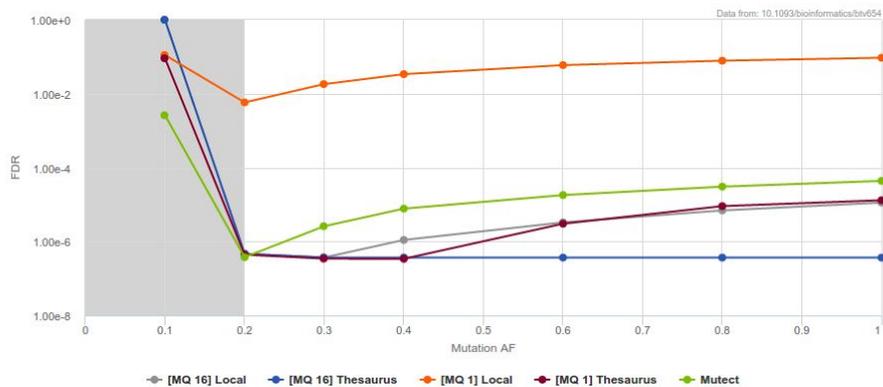
- **Data Repositories**
 - DOI-providing data preservation archives; Rich metadata containers; APIs
 - ORA Data (UOxford Institutional Data Repository), Centre for Open Science, FigShare, Zenodo, etc.
 - Potential for embargoes where required
- **Hosted Databases**
 - Provide hosted databases with SQL-based query access over ODBC or similar
 - Institutional databases, cloud-hosted services such as Microsoft Azure, Amazon Web Services, Google Cloud and others
 - Full access control lists by various criteria (for those with access to write, or grab the raw data)
- **File Hosting Services**
 - Flat file hosting services ranging from sync-and-share services to static file repositories
 - Services such Dropbox, Google Drive, etc.
 - Potential limitation on size of dataset
 - Potentially controlled access depending on service



Performance for calling somatic mutations from synthetic normal tumor sample pairs.

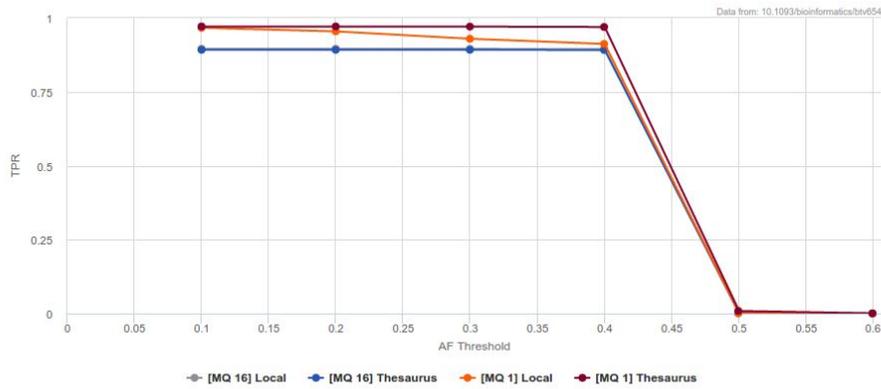


True positive rate (TPR) of various mutation detection approaches (note vertical axis does not start at 0 to emphasize the practically relevant TPR range). Dots represent synthetic tumor samples with different mutation allelic frequencies (AF). The approaches are Mutect, a local mutation calling at two mapping quality (MQ) thresholds, and thesaurus-assisted mutation calling at two mappability thresholds. Other methods are discussed in the Supplementary Text.

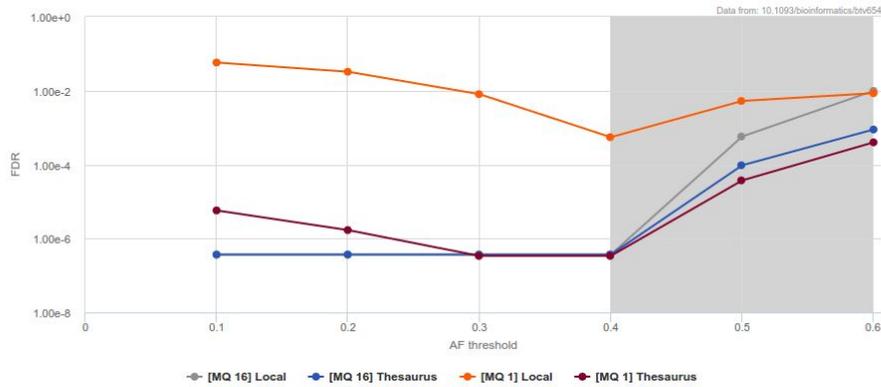


False discovery rates (FDR) for the same methods. The gray band indicates results with zero false positives and a small number of true positives, a performance regime that produces spuriously high FDRs based on Eq. (4).

Performance for calling de novo mutations in a synthetic family trio.

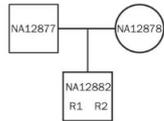


True positive rates (TPR) of various calling approaches. Dots represent actual calls at various thresholds for observed allelic frequency (AF); lines are simple interpolations. The approaches used to select candidates are local mutation calling at two mapping quality (MQ) thresholds, and the thesaurus assisted equivalents.

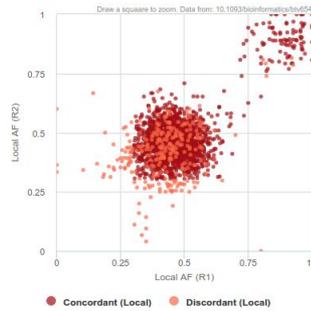


False discovery rates (FDR) for the same methods. The gray band indicates experiments with a small number of true positives and no false positives at all, for which Eq. (4) gives spuriously high FDR values.

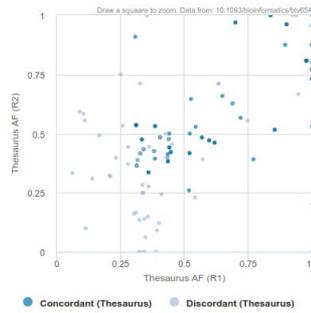
Results on de novo mutation calling from a family trio from the Platinum dataset.



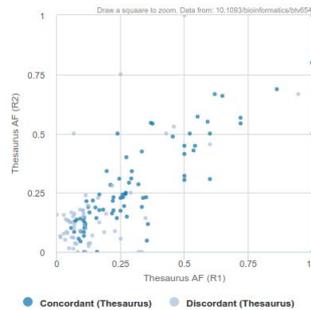
Family pedigree for sample NA12882. R1 and R2 denote two replicates of the child's genome.



Concordance of de novo mutation calls in two replicates of sample NA12882 obtained using a high (MQ 16) mapping quality threshold. Axes display the allelic frequencies (AF) of candidate sites in the two replicates.



Concordance of de novo mutation calls identified through thesaurus analysis of low mappability genomic regions (MQ 0) and not in the previous analysis. Allelic frequencies on the axes are informed by all thesaurus-linked genomic sites. (Thesaurus-adjusted AF > 1 are plotted at unity.)



Analogous to panel the panel above, but with allelic frequencies on the axes computed using data from only one genomic locus per mutation candidate

Long-term Preservation and Interactive Visualisations

- One of the problems with interactive visualisations is that they require infrastructure that needs to be maintained
 - The site hosting the project/edition needs to continue to be able to embed the visualisation
 - The visualisation engine still needs to be running
 - The data source still needs to be available
 - The various javascript and other libraries need to be updated (in cases of security updates)
- Most of these are slightly mitigated by institutional adoption but this is not a guarantee
- While the service runs it provides an unlimited account on ShinyApps.io
- Data should be deposited in well-known repositories for long-term preservation (we recommend our own institutional repository, FigShare, and Zenodo)
- For some publications:
 - Static image links to interactive visualization
 - Interactive visualization eventually replaced with static figure

Digital Scholarly Editions and Data

- We need to admit that our digital scholarly editions contain a lot of useful data other than the edited text
- We need not only to expose the underlying data of our editions, but also adjunct derivable resources, and present these all in a visually communicative but interactive manner
- We need to plan for obsolescence of all our digital tools and outputs in such a manner that the intellectual endeavour does not need to be repeated
- We need to work collaboratively to meet these and similar challenges

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