



Help us  
build a bot



ArchiveBots, Ver 3.1

Thursday, September 20<sup>th</sup>, 2018

# **SOLM-2018 machine learning training data set**

# Our vision is a SOLM-2023 database with 1 million marks, initials & signatures from across Europe & North America from the C16th to C18th



## The maths

- 3 person/months to create 5,000 signoff SOLM-2018 database consisting of image snippets; boundary boxed snippets on full page images; 5,000 lines x 25 rows of metadata
- 6 person/months to create our targeted 10,000 SOLM-2018 training database
- 20,000 signoff processing per person year
- Target of 1 million signoffs in our database
- 100,000 signoffs per year with 5 people working full time

That's TEN YEARS to achieve our vision  
with 50 person years to do it!!!!

The **SOLM-2018 database** is a tool for historians and computer scientists to work with marks, initials and signatures. It has been designed to support the exploration of historical literacy and the development of tools for automatic metadata creation.

We are looking for UK and international archival partners interested in contributing content to the SOLM-2018 tool and in learning about AI based pattern recognition.

We are especially interested in manuscripts containing marks, initials and signatures by individuals engaged in marine and shore trade occupations from the following English towns and areas for the C16th, C17th and C18th:

Aldeburgh [Suffolk]  
Barnstaple [Devon]  
Bermondsey  
Bristol  
Colchester [Essex]  
Dartmouth [Devon]  
Deptford

Dover [Kent]  
Falmouth [Devon]  
Faversham [Kent]  
Foy [Cornwall]  
Greenwich  
Harwich [Essex]  
Hull

Isleworth [Middlesex]  
Newcastle  
Plymouth [Devon]  
Rochester [Kent]  
Rotherhithe  
Southampton  
Southwark



6000 signoffs  
and growing

For further information contact Colin Greenstreet, community organiser, Signs of Literacy initiative, or Dr Mark Hailwood (Bristol)  
GitHub: <https://github.com/Signsofliteracy>

**Our challenge to archivists, computer scientists and historians:** Help us develop the tools to create a SOLM-2023 database of 1 mill signoffs with a productivity rate of ten times today's best, at a resource cost of 5 person/years, not 50 person/years, and in half the time

More generally, we need to work together, if we are going to make sense of our digitised manuscript archives – **developing AI tools to process archival images and to identify, extract, read and record metadata**

For more information contact Colin Greenstreet, community organiser of the Signs of Literacy initiative, and Dr Mark Hailwood (Bristol)  
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We are looking for international partners – archives & archivists, digital publishers,  
image & text oriented computer scientists & machine learners,  
corpus & historical linguists, and historians.  
United Kingdom, Netherlands, Sweden, Poland,  
Germany, France, Spain & North America

Contact:

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or Dr Mark Hailwood (Bristol)

GitHub: <https://github.com/Signsofliteracy/>

Web: <http://signsofliteracy.org>

# **Proposed project & funding bid**

# Help us build a bot

Build a quick and dirty Archival Bot in 50 days for further development in 2019

Work has started

Establish a process for machine supported volunteer extraction & synthesis of metadata for the SOLM-2018 machine learning training data set of markes, initials and signatures

Share first results at the Transkribus users conference in Vienna, November 8<sup>th</sup>-9<sup>th</sup>, 2018



Identify manuscript page with signoff
Establish type of signoff [marke, initial(s), signature]
Establish linked front matter of deposition
Establish foliation & image record numbers of signoff & front matter
Establish name of deponent & age
Establish residence of deponent
Establish occupation of deponent from front matter
Establish further occupational data from full text of manuscript
Data mine full text for social & economic parameters

**We are looking for a small number of volunteers to work with us as a facilitated remote team – public historians, who can read cursive script, coders & NLP experts - to create a quick and dirty bot as a Proof of Concept to show at the Transkribus Users Conference**



We are interested in bidding for Nesta funds to develop our November POC – who is interested in bidding with us?


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Expressions of interest to be submitted by Friday, November 11<sup>th</sup>, 2018

Final proposals submitted, February 2019

Final selection of experiments, March 2019

Experiments to be completed in ten months

Source: ArchiveBots, Ver2.0, 18/09/2018;

[https://github.com/Signsofliteracy/ArchiveBots/blob/master/ArchiveBots\\_Discussion\\_Document\\_Ver2.0\\_18092018.pdf](https://github.com/Signsofliteracy/ArchiveBots/blob/master/ArchiveBots_Discussion_Document_Ver2.0_18092018.pdf)

# Call for ideas

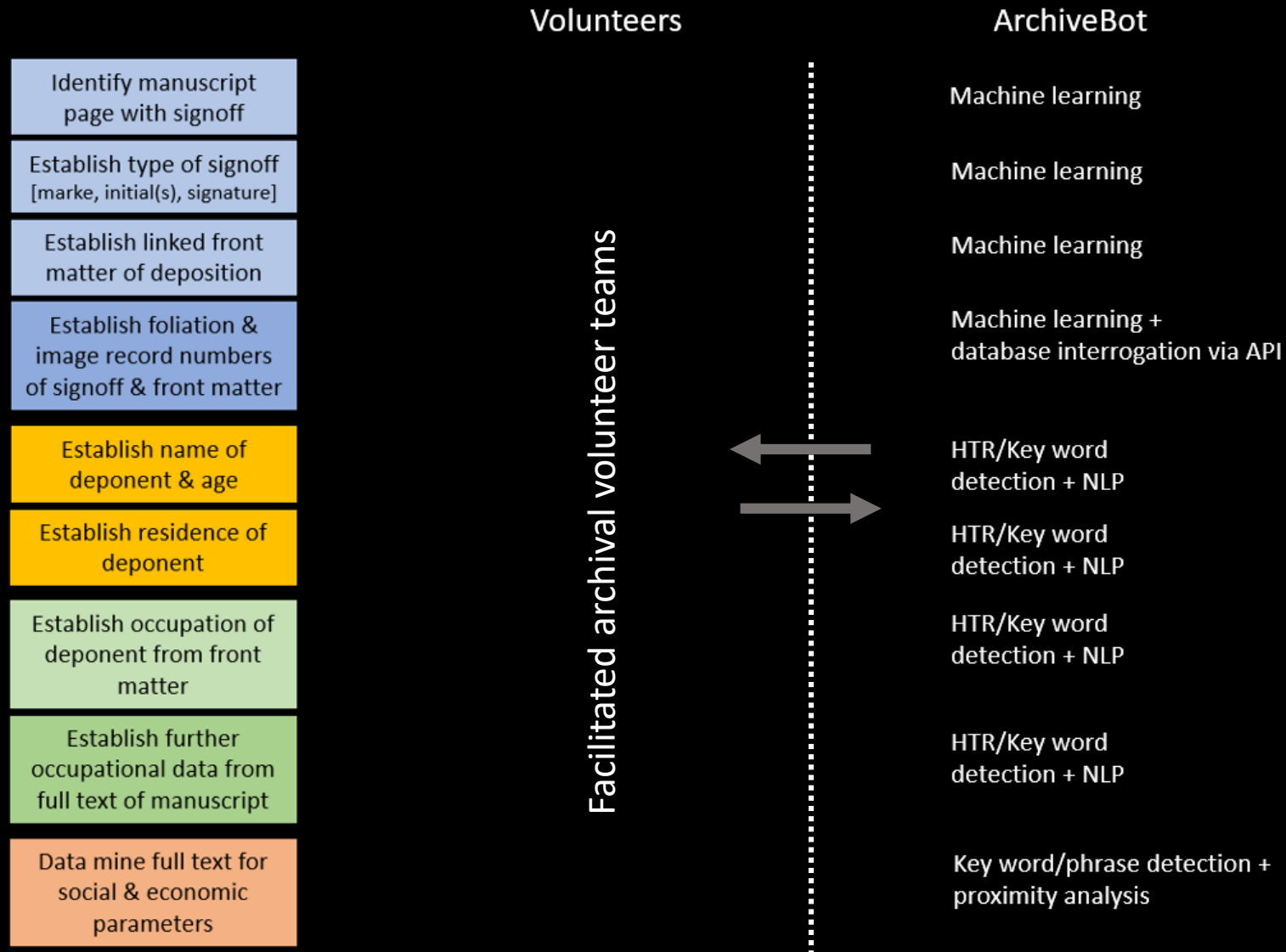
Nesta is offering grants of up to £20,000 for projects that generate new knowledge on how to advance collective intelligence (combining human and machine intelligence) to solve social problems.

Proposals should give an indication of the problem they are looking to solve and how this will be done. Below is a list of potential areas for experimentation. *Please note the examples are not exhaustive, so experiments looking at other areas are also welcome.*

- Increasing inclusion of citizens and public engagement in the participation of collective intelligence online platforms
- Translating data and insights generated through collective intelligence into action
- Harnessing collective intelligence to address the needs of underserved communities in cities or rural areas
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- Charities and public sector organisations piloting ways to increase their internal/organisational collective intelligence

# Collective intelligence

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# We are experimenting with key phrase and Boolean proximity search

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Identify manuscript page with signoff	Text mining using short phrases			
Establish type of signoff [marke, initial(s), signature]	Reading skills	Writing skills	Language skills	Experience of seafaring
Establish linked front matter of deposition	<p>"at his examination" [x10]                      "now shewed to him"                      "perused" [x350]                      "perused the schedule" [x14]                      "read or write"                      "read to him" [x22]                      "signed by this deponent"                      "the schedule"                      "write and read" [x18]                      "write nor read"                      "written hand" [x35]</p> <p>BUT: "the same being read to him now and hee this deponent haveing formerly read the same himself" [HCA 13/71 f.232v]</p>	<p>"a writing" "firme" [x163]                      "firmed" [x33]                      "handwriting" [x166]                      "his hand(e)"                      "his usuall manner" [x7]                      "in writ(e)ing"                      "letter of advise"                      "marke" [x1365]                      "owne handwriting" [x16]                      "proper handwriting" [x30]                      "proper hand writing" [x34]                      "signature" [x3515]                      "signed sealed and delivered"                      "subscribe his marke" [x1]                      "subscribe his name" [x18]                      "subscribed with" [x47]                      "subscription" [x80]</p> <p>"the firme" [x33]                      "the letter"                      "the signeing"                      "usuall manner of" [x5]                      "writeing" [x122]                      "writings" [x269]                      "writing his name" [x2]</p>	<p>"dutch tongue" [x21]                      "french tongue" [x8]                      "flemmish" [x29]                      "flemmish speech" [x1]                      "ffrench tongue" [x8]                      "spanish tongue" [x15]                      "spoken" [x216]                      "tongue" [x144]</p>	<p>"bin at sea" [x45]                      "by goeing to sea" [x10]                      "by profession"                      "by the space of" [x187]                      "from his youth" [x21]                      "goe to sea" [x79]                      "going to sea" [x10]                      "master of shippes" [x22]                      "navigation"                      "used seafaring" [x8]                      "used the sea" [x45]                      "used the seas" [x6]                      "used to goe to sea" [x12]</p>
Establish name of deponent & age	Birth place	Occupation (past & present)	Worth of estate	General
Establish residence of deponent	<p>"borne" [x923]                      "hath lived" [x535]                      "hee hath lived" [x134]                      "lifetime" [x3]                      "life tyme" [x63]                      "living all his life tyme"</p>	<p>"being one of the" [x255]                      "by profession" [x78]                      "he knoweth being" [x119]                      "hee knoweth being" [x630]                      "knoweth being" [x937]</p>	<p>"an estate" [x24]                      "debts paid" [x32]                      "estate" [x653]                      "his debts paid" [x11]                      "knoweth not" [x1,786]                      "owes but" [x3]                      "what he is worth" [x7]                      "worth but little" [x1]</p>	<p>"all which he knoweth" [x30]                      "all which hee knoweth" [x346]                      "the premisses hee knoweth" [x95]                      "the premisses hee knoweth for that" [x14]                      "well acquainted with"</p>
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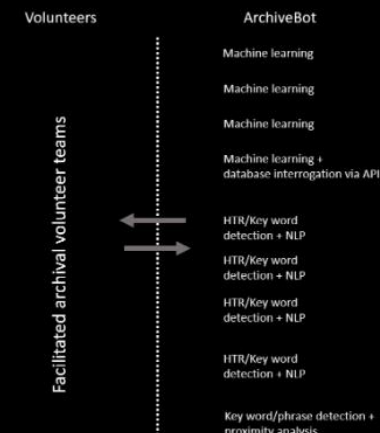


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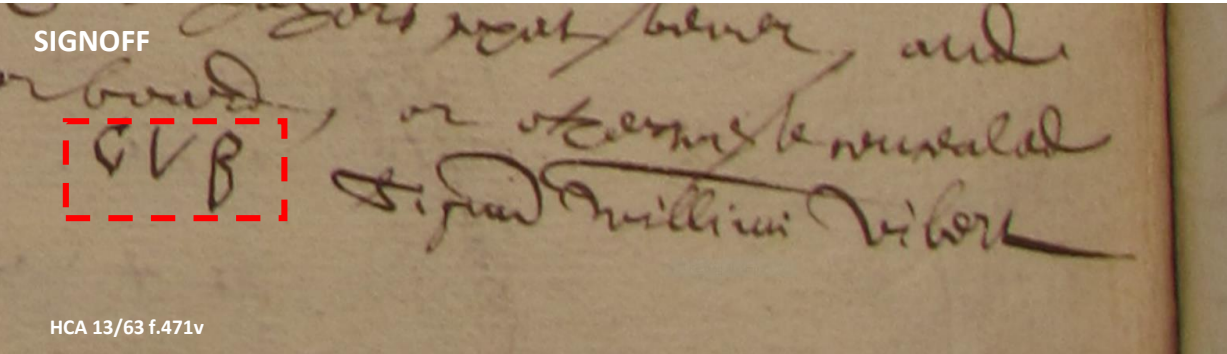
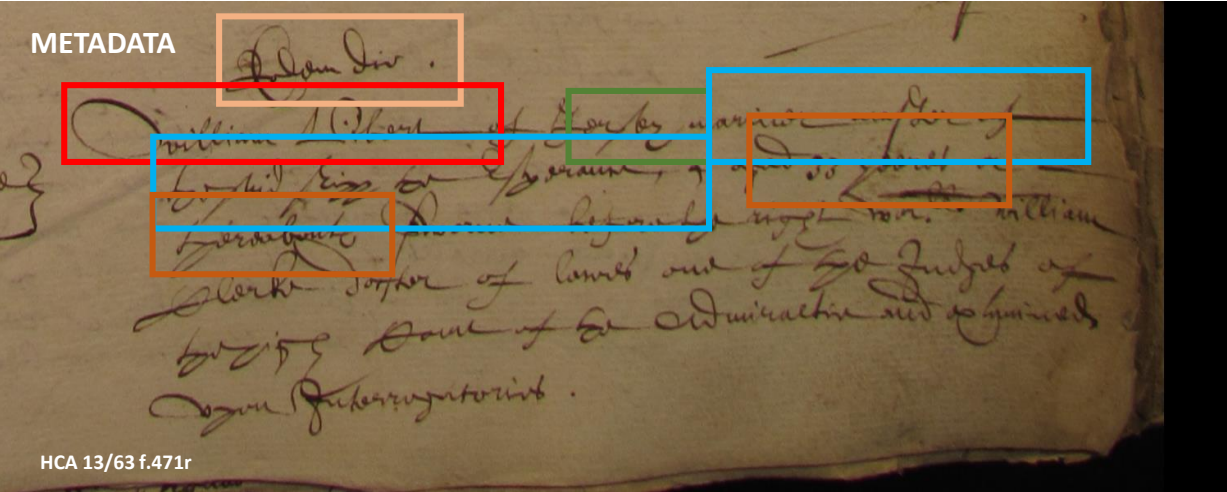
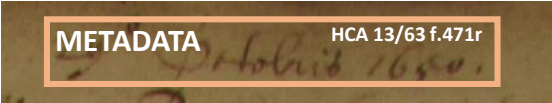
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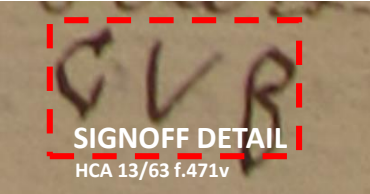
**Imagine an ArchiveBot**



# Imagine an ArchiveBot extracting metadata automatically from handwritten manuscripts and working with volunteers to finalise



<div></div>	Date	<div></div>	Occupation
<div></div>	Name	<div></div>	Age
<div></div>	Residence	<div></div>	Signoff



William Vibert (Guillaume Vibert) was a thirty-three year old mariner from the isle of Jersey, who was master of the ship the *Esperansa*.

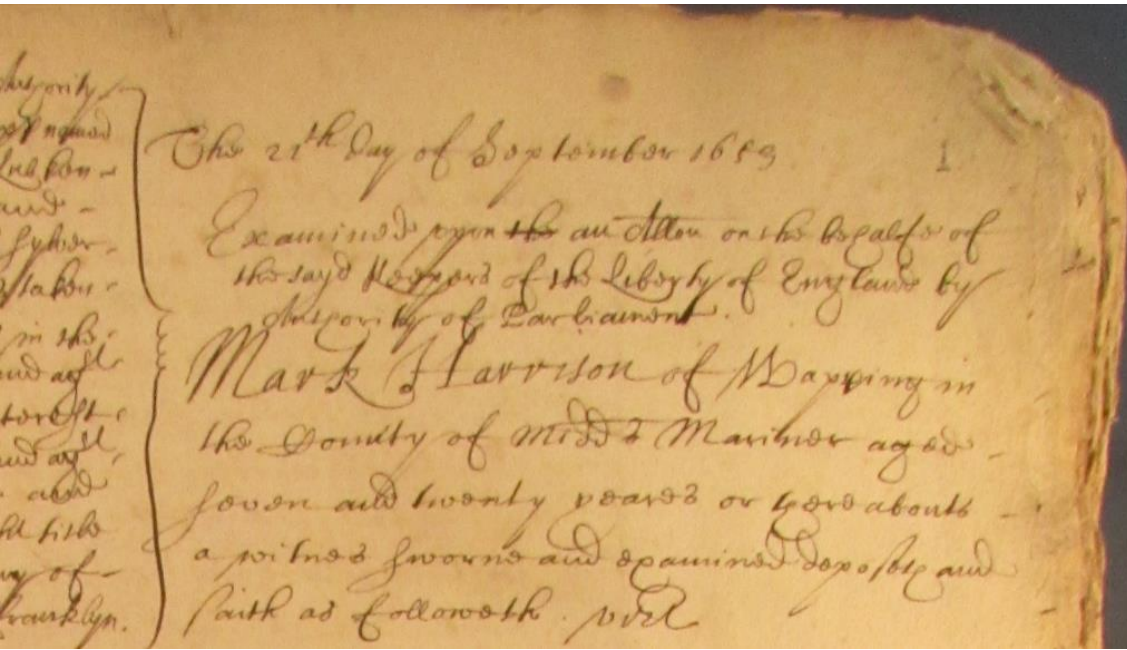
He signed his deposition in the English High Court of Admiralty on October 29<sup>th</sup> 1650, using three not two initials.

The choice of “G”, “V” and “B” for initials suggests he thought of himself and pronounced his name as “Guillaume Vee Bert” (though he could not write a full signature)

- Challenge for a Bot
- (1) Find the date of the deposition (it is at the top of the same manuscript page above the preceding deposition)
  - (2) Deal with the interlineation in the metadata
  - (3) On the next manuscript page, recognise “GVB” are initials not a marke. The “G” is quite tough (easy to mistake for “C”). Yes, they are recognisable letters, but the three don’t match the two names “William Vibert”. Need to know William – Guillaume in French, and that mariners in Jersey may be born in France and French speaking.

Source: [http://www.marinelives.org/wiki/HCA\\_13/63\\_f.471r\\_Annotate](http://www.marinelives.org/wiki/HCA_13/63_f.471r_Annotate);  
[http://www.marinelives.org/wiki/HCA\\_13/63\\_f.471v\\_Annotate](http://www.marinelives.org/wiki/HCA_13/63_f.471v_Annotate)

# Speech to text recognition



Watson [Speech to Text](#) / [Speech to Text Demo](#)

## Speech to Text

The IBM Watson Speech to Text service uses speech recognition capabilities to convert Arabic, English, Spanish, French, Brazilian Portuguese, Japanese, Korean, and Mandarin speech into text.

[Get Started](#) [API Reference](#) [Documentation](#) [Fork on GitHub](#) [Start for free in IBM Cloud](#)

Voice Model:

GB English broadband model (16KHz)

mark Harris<sup>2</sup> and of<sup>4</sup> what happened<sup>7</sup> in<sup>2</sup> the county of Middlesex mariner<sup>8</sup> aged seven and twenty years

mark Harrison<sup>3</sup> of<sup>2</sup> walking<sup>8</sup> in<sup>2</sup> the county of Middlesex mariner<sup>15</sup> aged seven and twenty years or<sup>2</sup> there<sup>4</sup> about

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# Can we use key word spotting to excavate raw metadata?

## LANGUAGE DENOTING OCCUPATION



A snippet of handwritten text in cursive script, likely from a 17th-century legal document.

"The premisses hee deposeth being one of the company of the *Bridgewater ffrygott*, and sawe the same soe done" [[HCA 13/72 f.90r](#)] [CONCLUSION: One of the company]

A snippet of handwritten text in cursive script, continuing the legal narrative.

"The premisses he deposeth for that he the deponent was not onely for the voyage arlate wherein she was stranded, but in two former voyages stiersman of the sayd ship" [[HCA 13/72 f.90v](#)] [CONCLUSION: Steersman]

A snippet of handwritten text in cursive script, mentioning the purchase of a ship.

"after such buying of the said shipp the *Santa Hellen* by the said da [*?Groots*] and company aforesaid, namely in or about the moneth of October 1643 (about three monethes after the adiudication aforesaid) being in possession of the said vessell, put and constituted this deponent master of her, and hee then entred master upon her at Port Lewes in Bretany" [[HCA 13/72 f.95r](#)] [CONCLUSION: Master]

A snippet of handwritten text in cursive script, mentioning the master's mate.

"all which hee knoweth being masters mate of the said shipp the said voyage" [[HCA 13/70 f.669v](#)] [CONCLUSION: Master's mate]

A snippet of handwritten text in cursive script, mentioning the boatswain's mate.

"hee knoweth the premisses because hee was boatswaines mate of the said shipp and went all the said voyage in her" [[HCA 13/70 f.671r](#)] [CONCLUSION: Boatswain's mate]



# Can we refine raw machine generated metadata using a combination of NPL, controlled vocabularies, and programmable decision rules?



## LANGUAGE DENOTING OCCUPATION

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KaggleTestSnippet_HCA_1370_f.546r.PNG	HCA 13/70	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1370_f.571v.PNG	HCA 13/70	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1370_f.596v_One.PNG	HCA 13/70	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1370_f.636r.PNG	HCA 13/70	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1370_f.671v.PNG	HCA 13/70	Marke	Mariner; Boatswain's mate	
KaggleTestSnippet_HCA_1368_f.631v.PNG	HCA 13/68	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1371_f.27r.PNG	HCA 13/71	Initials	Mariner; Boatswain	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain	
KaggleTestSnippet_HCA_1371_f.27v_Two.PNG	HCA 13/71	Initials	Mariner; Boatswain	
KaggleTestSnippet_HCA_1368_f.640r.PNG	HCA 13/68	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1368_f.667r.PNG - CREATE	HCA 13/68	Signature	Mariner; Boatswain [of the Civill Society]	
KaggleTestSnippet_HCA_1371_f.77v.PNG	HCA 13/71	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1370_f.378r.PNG	HCA 13/70	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1371_f.99r.PNG	HCA 13/71	Signature and	Mariner; Boatswain [of man of war]	
KaggleTestSnippet_HCA_1370_f.484v.PNG	HCA 13/70	Signature	Mariner; Quartermaster; Boatswain	
KaggleTestSnippet_HCA_1371_f.199v.PNG	HCA 13/71	Signature	Mariner; Boatswain	
KaggleTestSnippet_HCA_1371_f.167r.PNG	HCA 13/71	Signature	Mariner; Boatswain [of the John and Mary]	
KaggleTestSnippet_HCA_1371_f.279r.PNG	HCA 13/71	Signature	Mariner; Boatswain	

File name-HC	Volume	Type	Occupation	Month Signed	Year of Signature	Country of Signature	Street/Parish	Parish	Town	County	Age	Year of Signature	Estimated Age of Person at Time of Signature	Initials	Last name
KaggleTestSnippet_HCA_1370_f.120r.PNG	HCA 13/70	Signature	Mariner; Boatswain	April	1643	United Provinces (Dutch)			Flushing		47	1644	1647 John	Boater	
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KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain			England			Ratcliff	Stoney	26	1655	1628 Christopher	Daimes	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain			England			Ratcliff	Stoney	26	1655	1628 Joseph	Capewell	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain's One of the company			England			Wapping		22	1655	1625 Robert	Sherring	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain			England			London	Stoney	33	1655	1622 Edward	King	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain			England			Connaught		22	1655	1625 William	Colquhoun	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain			England			London	Stoney	33	1655	1622 John	Johnson	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain			England			London	Stoney	41	1655	1621 Hendrick	Peterson	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Principal boatswain			London			Stoney		34	1655	1621 Hendrick	Melton	
KaggleTestSnippet_HCA_1370_f.120v.PNG	HCA 13/70	Signature	Mariner; Boatswain's mate			London			Stoney		24	1655	1621 William	Allen	
KaggleTestSnippet_HCA_1368_f.631v.PNG	HCA 13/68	Signature	Mariner; Boatswain			England			Stoney		30	1654	1624 Thomas	Barnes	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
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KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain			England			Stoney		33	1654	1621 Thomas	Serpent	
KaggleTestSnippet_HCA_1371_f.27v_One.PNG	HCA 13/71	Initials	Mariner; Boatswain	</											

# An ArchiveBot would need to be able to read manuscript text from the main body of legal depositions, not just the front matter at the start of a deposition

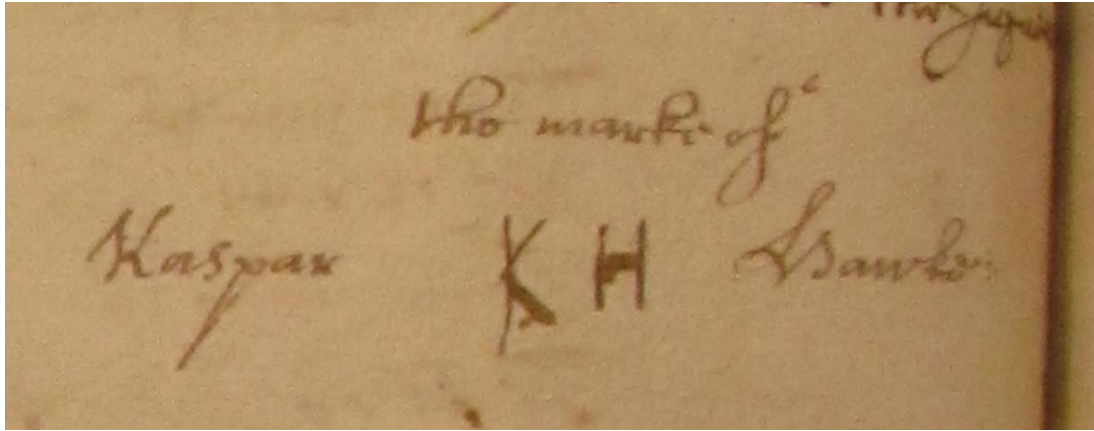


Table 21.1: Extract from occupational data sub-set in SOLM-2018 data set			
Data as of 11/09/2018			
Occupations [Synthesised]	Occupations stated in main metadata	Additional occupations & titles in body of deposition	Stated activities in body of text
<b>BOATSWAINS</b>			
Seaman; Commonman [outwards]; Boatswain [return]	Seaman	Commonman [outwards]; Boatswain [return]	
Nauta [mariner]; Coxwain [outwards] [on Thomas and John]; Boatswain [return] [on Thomas and John]	Nauta [mariner]	Coxwain [outwards] [on Thomas and John]; Boatswain [return] [on Thomas and John]	
Nauta [mariner]; Boatswain's mate [of Thomas and John]; [?Part-owner of ship Thomas and John]	Nauta [mariner]; Boatswain's mate [of Thomas and John]	[?Part-owner of ship Thomas and John]	
Nauta [mariner]; Boatswain [of the Samuel and Mary]	Nauta [mariner]; Boatswain [of the Samuel and Mary]		
Nauta [mariner]; Boatswain [of the Mathewe]	Nauta [mariner]; Boatswain [of the Mathewe]		
Mariner; Boatswain [of the Hopewell]; One of the company [of the Hopewell]	Mariner; Boatswain [of the Hopewell]	One of the company [of the Hopewell]	
Mariner; Boatswain [of the Hawke of Stockholm]	Mariner	Boatswain [of the Hawke]	
Mariner; Boatswain [of the herring busse the Liesda]	Mariner; Boatswain [of the herring busse the Liesda]		
Mariner; Boatswain [of the Pearce]	Mariner; Boatswain [of the Pearce]		
Mariner; Boatswain [of the Saint John]	Mariner; Boatswain [of the Saint John]		
Mariner; Boatswain [of the Liesde]; One of the company [of the Liesde]	Mariner	Boatswain [of the Liesde]; One of the company [of the Liesde]	
Mariner; Boatswain [of the Recovery]	Mariner; Boatswain [of the Recovery]		
Boatswain [of the Arke]	Boatswain [of the Noahs Arke or Arke]		
<b>RANDOM SELECTION OF OCCUPATIONS</b>			
Waterman	Waterman		Being aboard the Saint Christofer
?	?		Bound in a bond
Mariner; Sopra cargo; Steward [of unnamed ship]	Mariner	Sopra cargo; Steward [of unnamed ship]	Has used the Virginia trade for 16 years
Haberdasher; Citizen	Haberdasher; Citizen		Involved in arbitration
Merchant	Merchant		Kept accounts for Mr William Bewly, merchant of London
Merchant; Servant [to William Brugg]	Merchant	Servant	Kept his bookes [of William Brugg]
Merchant cashier [to merchant]	Merchant cashier		Made entries in books of accounts
Mariner; Master's mate [of the Advantage frigot]	Mariner; Master's mate [of the Advantage frigot]		Present at taking of the Golden Starr
Sailor	Sailor		Put on board captured ship
Cooper [on shore]	Cooper [on shore]		Taking up oiles
Sailor; Worked on building of ship [the Great Christofer]	Sailor		Worked on building of ship [the Great Christofer]

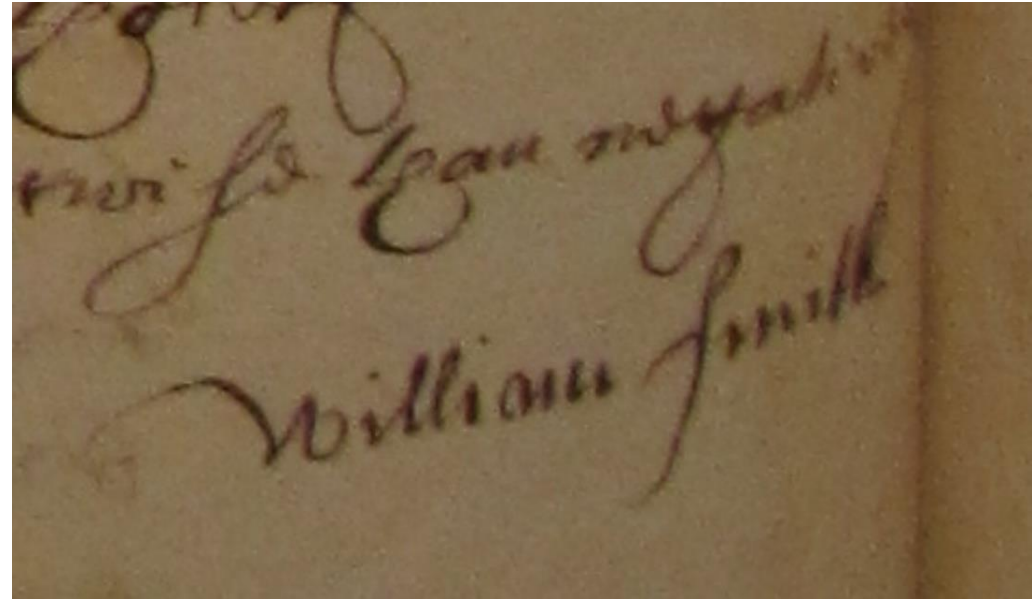
Note four out of thirteen boatswains identified here are described simply as seaman, nauta or mariner in the legal front matter

Note information on activities of deponents in main body of text helps clarify and refine the main occupational descriptions

# Mismatch between English rendition of names in front matter and initials and signatures made by non-native English speakers at end of deposition

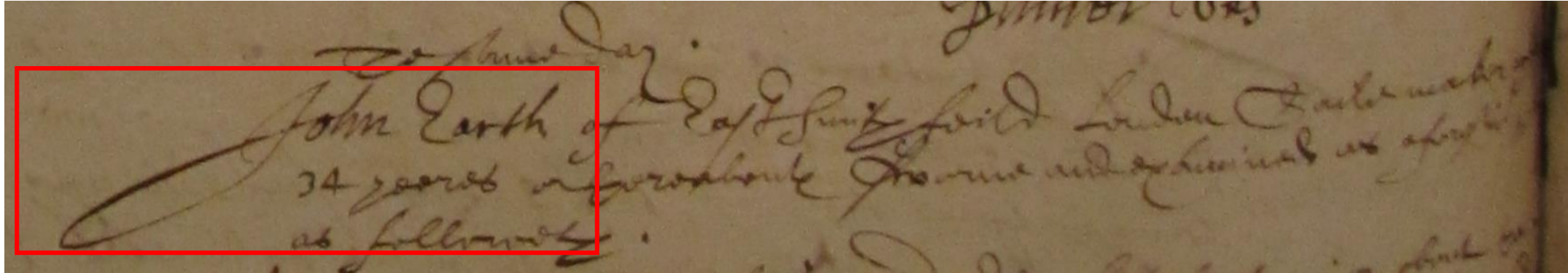


Front matter: Gaspar Hawke  
Initials: KH [Kaspar Hawke]

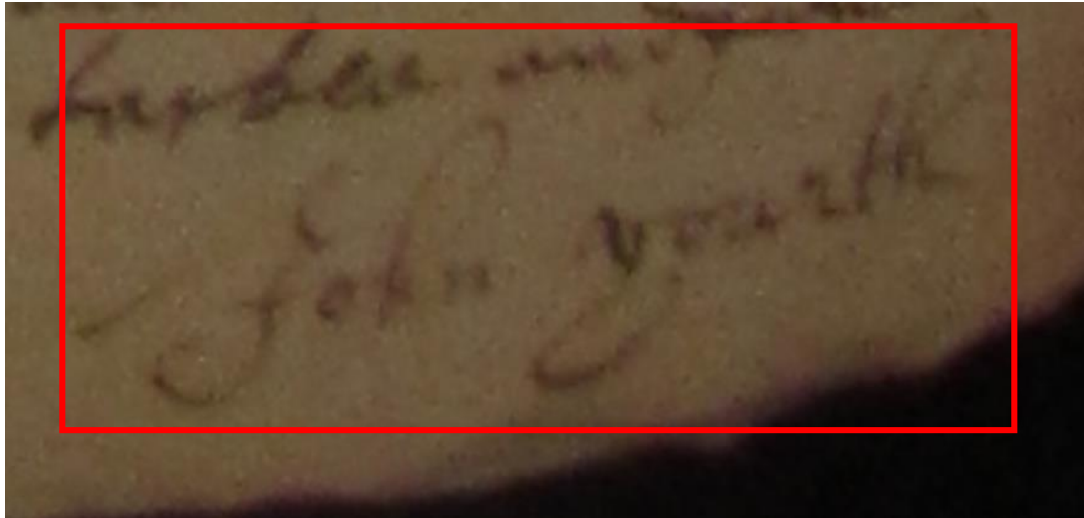


Front matter: William de Smitt  
Signature: William Smith

# Phonetic difference between versions of signatures in legal documents



John Earth of East London Charter master  
34 years of age and a bachelor as appears  
as follows.



John Yearth

Front matter: "John Earth"  
Signature: "[?John Yearth]"



# Occupations in front matter associated with “One of the company” in body of text



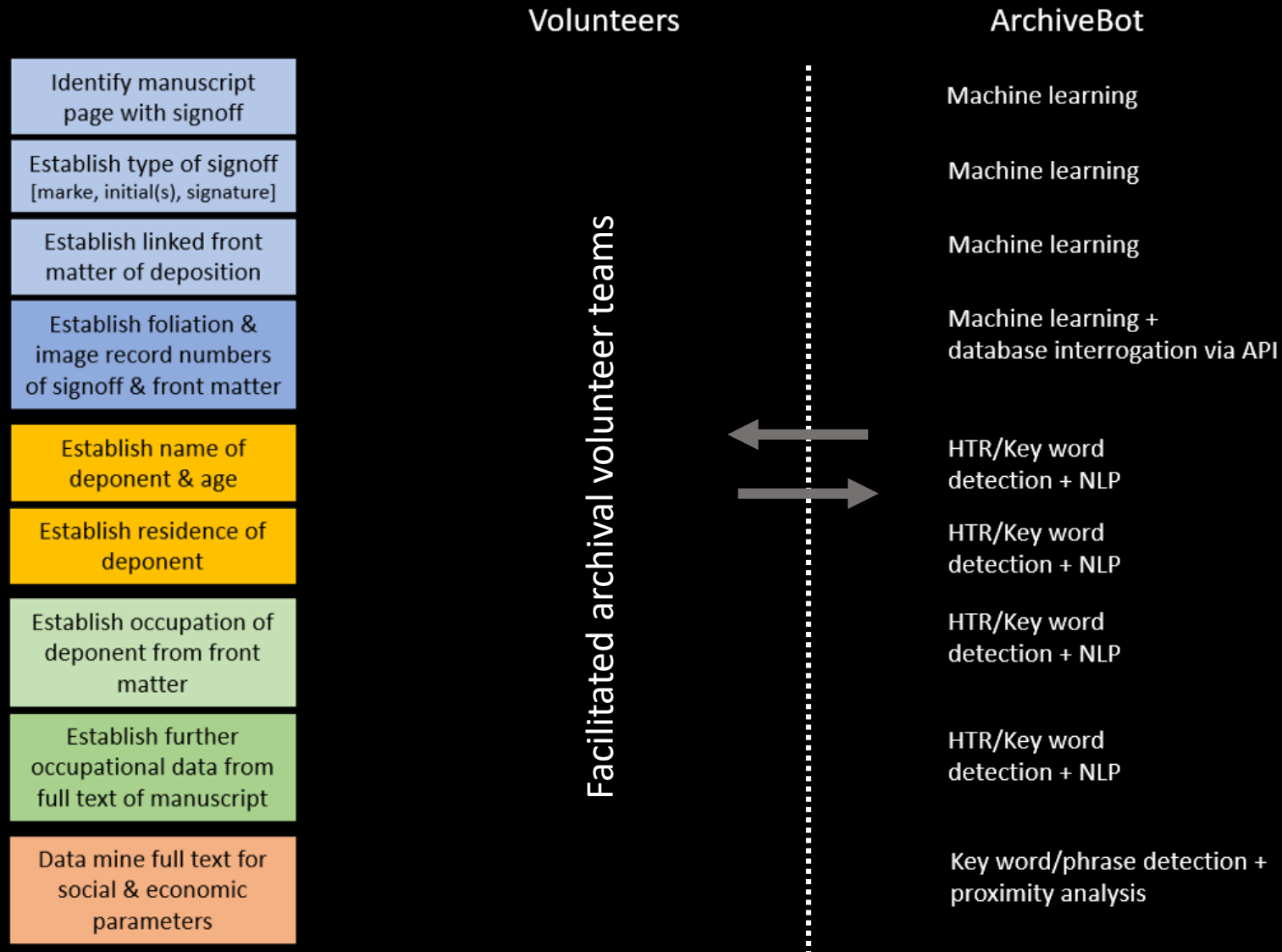
Table 21.2: Extract from occupational data sub-set in SOLM-2018 data set	
Occupations in front matter associated with “One of the company” in body of text	
Data as of 12/09/2018	
Occupations stated in main metadata	Additional occupations & titles in body of deposition
Carpenter [on ship] [of the Great Christopher]	One of the company [of the Great Christofer]
Mariner	Boatswain [of the Liesde]; One of the company [of the Liesde]
Mariner	Foremastman; One of the company
Mariner	One of the company
Mariner	One of the company [of the Peter and Jane, burthen = 250 tons]; Prisoner [in Lisbon]
Mariner	One of the company [of the ffreetrade]
Mariner	One of the company
Mariner	One of the company; Cooke [cook]
Mariner	One of the company; Common man of the company
Mariner	One of the company [of the Olive Branch]; Master [of the Olive Branch, on death of its master during voyage]
Mariner	One of the company [of the John]; Steersman [of a Spanish man of war, the Angell, under a Claes Johnson]; Appointed acting master [of the Angell, by Claes Johnson, while he went overland to Saint Domingo]
Mariner	Coxen [of the ffrancis and John]; One of the company [of the ffrancis and John]
Mariner; Boatswain [of the Hopewell]	One of the company
Mariner; Boatswain [of the Seven Sisters, a ship granted a Commission]	One of the company [of the Seven Sisters, a ship granted a Commission]
Sailor	One of the company
Sailor	Cook [of the Saint Peter]; One of the company [of the Saint Peter]
Sailor	One of the company [of the Endeavour of Arundell]
Sailor	One of the company [of the Maidstone frigot in the immediate service of the English Commonwealth]

# **Processes for automation**



# Collective intelligence

Help us  
build a bot



# We are experimenting with key phrase and Boolean proximity search

Help us  
build a bot

Identify manuscript page with signoff	Text mining using short phrases			
Establish type of signoff [marke, initial(s), signature]				
Establish linked front matter of deposition				
Establish foliation & image record numbers of signoff & front matter				
Establish name of deponent & age				
Establish residence of deponent				
Establish occupation of deponent from front matter				
Establish further occupational data from full text of manuscript				
Data mine full text for social & economic parameters				
	Reading skills	Writing skills	Language skills	Experience of seafaring
	"at his examination" [x10] "now shewed to him" "perused" [x350] "perused the schedule" [x14] "read or write" "read to him" [x22] "signed by this deponent" "the schedule" "write and read" [x18] "write nor read" "written hand" [x35]	"a writing" "firme" [x163] "firmed" [x33] "handwriting" [x166] "his hand(e)" "his usuall manner" [x7] "in writ(e)ing" "letter of advise" "marke" [x1365] "owne handwriting" [x16] "proper handwriting" [x30] "proper hand writing" [x34] "signature" [x3515] "signed sealed and delivered" "subscribe his marke" [x1] "subscribe his name" [x18] "subscribed with" [x47] "subscription" [x80]	"dutch tongue" [x21] "french tongue" [x8] "flemmish" [x29] "flemmish speech" [x1] "ffrench tongue" [x8] "spanish tongue" [x15] "spoken" [x216] "tongue" [x144]	"bin at sea" [x45] "by goeing to sea" [x10] "by profession" "by the space of" [x187] "from his youth" [x21] "goe to sea" [x79] "going to sea" [x10] "master of shippes" [x22] "navigation" "used seafaring" [x8] "used the sea" [x45] "used the seas" [x6] "used to goe to sea" [x12]
	Birth place	Occupation (past & present)	Worth of estate	General
	"borne" [x923] "hath lived" [x535] "hee hath lived" [x134] "lifetime" [x3] "life tyme" [x63] "living all his life tyme"	"being one of the" [x255] "by profession" [x78] "he knoweth being" [x119] "hee knoweth being" [x630] "knoweth being" [x937]	"an estate" [x24] "debts paid" [x32] "estate" [x653] "his debts paid" [x11] "knoweth not" [x1,786] "owes but" [x3] "what he is worth" [x7] "worth but little" [x1]	"all which he knoweth" [x30] "all which hee knoweth" [x346] "the premisses hee knoweth" [x95] "the premisses hee knoweth for that" [x14] "well acquainted with"

## Text mining using short phrases

### Reading skills

"at his examination" [x10]  
 "now shewed to him"  
 "perused" [x350]  
 "perused the schedule" [x14]  
 "read or write"  
 "read to him" [x22]  
 "signed by this deponent"  
 "the schedule"  
 "write and read" [x18]  
 "write nor read"  
 "written hand" [x35]

BUT: "the same being read to him now and hee  
 this deponent haveing formerly read the same  
 himself" [HCA 13/71 f.232v]

### Writing skills

"a writing" "firme" [x163]  
 "firmed" [x33]  
 "handwriting" [x166]  
 "his hand(e)"  
 "his usuall manner" [x7]  
 "in writ(e)ing"  
 "letter of advise"  
 "marke" [x1365]  
 "owne handwriting" [x16]  
 "proper handwriting" [x30]  
 "proper hand writing" [x34]  
 "signature" [x3515]  
 "signed sealed and  
 delivered"  
 "subscribe his marke" [x1]  
 "subscribe his name" [x18]  
 "subscribed with" [x47]  
 "subscription" [x80]

### Language skills

"dutch tongue" [x21]  
 "french tongue" [x8]  
 "flemmish" [x29]  
 "flemmish speech" [x1]  
 "ffrench tongue" [x8]  
 "spanish tongue" [x15]  
 "spoken" [x216]  
 "tongue" [x144]

### Experience of seafaring

"bin at sea" [x45]  
 "by goeing to sea" [x10]  
 "by profession"  
 "by the space of" [x187]  
 "from his youth" [x21]  
 "goe to sea" [x79]  
 "going to sea" [x10]  
 "master of shippes" [x22]  
 "navigation"  
 "used seafaring" [x8]  
 "used the sea" [x45]  
 "used the seas" [x6]  
 "used to goe to sea" [x12]

### Birth place

"borne" [x923]  
 "hath lived" [x535]  
 "hee hath lived" [x134]  
 "lifetime" [x3]  
 "life tyme" [x63]  
 "living all his life tyme"

### Occupation (past & present)

"being one of the" [x255]  
 "by profession" [x78]  
 "he knoweth being" [x119]  
 "hee knoweth being" [x630]  
 "knoweth being" [x937]

### Worth of estate

"an estate" [x24]  
 "debts paid" [x32]  
 "estate" [x653]  
 "his debts paid" [x11]  
 "knoweth not" [x1,786]  
 "owes but" [x3]  
 "what he is worth" [x7]  
 "worth but little" [x1]

### General

"all which he knoweth" [x30]  
 "all which hee knoweth" [x346]  
 "the premisses hee knoweth" [x95]  
 "the premisses hee knoweth for that" [x14]  
 "well acquainted with"

# Full text mining

# Text mining using short phrases

Reading skills	Writing skills	Language skills	Experience of seafaring
<p>“at his examination” [x10]  “now shewed to him”  “perused” [x350]  “perused the schedule” [x14]  “read or write”  “read to him” [x22]  “signed by this deponent”  “the schedule”  “write and read” [x18]  “write nor read”  “written hand” [x35]</p> <p>BUT: “the same being read to him now and hee this deponent haveing formerly read the same himself” [HCA 13/71 f.232v]</p>	<p>“a writing” “firme” [x163]  “firmed” [x33]  “handwriting” [x166]  “his hand(e)”  “his usuall manner” [x7]  “in writ(e)ing”  “letter of advise”  “marke” [x1365]  “owne handwriting” [x16]  “proper handwriting” [x30]  “proper hand writing” [x34]  “signature” [x3515]  “signed sealed and delivered”  “subscribe his marke” [x1]  “subscribe his name” [x18]  “subscribed with” [x47]  “subscription” [x80]</p> <p>“the firme” [x33]  “the letter”  “the signeing”  “usuall manner of” [x5]  “writeing” [x122]  “writings” [x269]  “writing his name” [x2]</p>	<p>“dutch tongue” [x21]  “french tongue” [x8]  “flemmish” [x29]  “flemmish speech” [x1]  “ffrench tongue” [x8]  “spanish tongue” [x15]  “spoken” [x216]  “tongue” [x144]</p>	<p>“bin at sea” [x45]  “by goeing to sea” [x10]  “by profession”  “by the space of” [x187]  “from his youth” [x21]  “goe to sea” [x79]  “going to sea” [x10]  “master of shippes” [x22]  “navigation”  “used seafaring” [x8]  “used the sea” [x45]  “used the seas” [x6]  “used to goe to sea” [x12]</p>
Birth place	Occupation (past & present)	Worth of estate	General
<p>“borne” [x923]  “hath lived” [x535]  “hee hath lived” [x134]  “lifetime” [x3]  “life tyme” [x63]  “living all his life tyme”</p>	<p>“being one of the” [x255]  “by profession” [x78]  “he knoweth being” [x119]  “hee knoweth being” [x630]  “knoweth being” [x937]</p>	<p>“an estate” [x24]  “debts paid” [x32]  “estate” [x653]  “his debts paid” [x11]  “knoweth not” [x1,786]  “owes but” [x3]  “what he is worth” [x7]  “worth but little” [x1]</p>	<p>“all which he knoweth” [x30]  “all which hee knoweth” [x346]  “the premisses hee knoweth” [x95]  “the premisses hee knoweth for that” [x14]  “well acquainted with”</p>

# Text mining using short phrases

## Indirect hints as to occupation

“his booke not being nowe in his custodie” [x1] [hints at boatswain]

“his ship” [x151] [weakly hints at master]

“his ship” [x450] [weakly hints at master]

# **Visualising metadata created with aid of ArchiveBots**



# We need visual metadata, which can be machine processed



**Table 1.2a EXPANDED: HCA 13/53 [f.1r-340v] - Signoff frequency per manuscript page, data from 1637**

	1		2		3		4		5		6		7		8		9		10		Subtotal
	r	v	r	v	r	v	r	v	r	v	r	v	r	v	r	v	r	v	r	v	
1-10	1	2	3	1	0	1	1	0	2	2				1		1			1		16
11-20	2	2	1		1		1		1		1	1		1		1			1		13
21-30	2	1		1		3	1	1		1		2		1			2			1	16
31-40		1	1	1			1	1	1	2			1	2		1		1			13
41-50		1		1						1		1		1					1		6
51-60			1		1		2	1		2		2		2		2					11
61-70	2			1	1		2	2	1	1	1	1		1	2	2	1	1	1		18
71-80	1		2	1			1	2	1	2		1	1	1	1	3			2		19
81-90	2	1	1	1	1	1	1	2	1	2	2	4	1	1			1		1		23
91-100	1	2			1			2	2	2	3	3	1	3			1	1	3	1	26
101-110	2	1	2	2	1	1	1	2	2	1	1	1	1		2	1	2				23
111-120	1			1				1	1	2		1		2	1	2	2	1	1		16
121-130			1				2				1	1	2			3	1		1		12
131-140	2	3	2	1	1	2				1		1	1	1	2	2	1	2		1	23
141-150	1	1	2	1	2	2	1	2		1	2	1	1	1	1		2		1		22
151-160		1					2		1	1	2	1	2	2	1	1	2		1	1	18
161-170		1		2	2	1				1	2	1	1	1	2	1	1		2		17
171-180	1	2			2	1	1		1	1		1							1		11
181-190					2						3	1	2	1	4	4	2	1	1		21
191-200		1		1		1	1	1	1		1	1		1	1	2	1	2	2		17
201-210	2	2				1	1			2	4	3		1		2	1	2	1	2	24
211-220	1			2	1			1		1		1	4	1	2	3	4	2	2		25
221-230	2	2	1		3		1	2		1	1	1	1	2	2	2	2			2	25
231-240		1	1		1		2	1	1			3		2	2	2				1	15
241-250	2									2	1	1	1	1	2	2	1		2		15
251-260	2		2	2	1		1	1		1	1	1			1		1			1	15
261-270		1	1		1		1	1			1	1			1		1			2	11
271-280	2			1			1		1	1	1			1		2	1		1		12
281-290	1			1		2	1		1	1	1		1	1	1	2			1		14
291-300		1		1	1	1	1	2		1		1	1	1	1		1	1		1	15
301-310		1		2						2	1		2	1	1		1			1	12
311-320			1					1						1	2	1					6
321-330				1					1				1					1	3		7
331-340	1	2	2	2			2		1	1	1	1	1	1	1	1	1		1		18
Total	31	30	24	27	23	17	23	30	19	31	31	39	31	33	30	42	33	16	29	16	555

# Archivists, computer scientists and users of all sorts need to work together



Table 1.2a: HCA 13/53 [f.1r-100v] - Signoff frequency per manuscript page, data from 1637

	1	2	3	4	5	6	7	8	9	10	Total
1-10	1	2	3	1	0	1	1	0	2	2	16
11-20	2	2	1	1	1	1	1	1	1	1	13
21-30	2	1	1	1	3	1	1	1	1	2	18
31-40	1	1	1	1	1	1	1	2	1	1	13
41-50	1	1	1	1	1	1	1	1	1	1	10
51-60	1	1	1	1	2	1	2	1	2	2	16
61-70	2	2	1	1	1	2	1	1	1	1	20
71-80	1	2	1	1	1	2	1	2	1	1	19
81-90	2	1	1	1	1	1	2	1	2	2	23
91-100	1	2	1	1	1	2	2	2	3	3	26
Total	1	2	1	1	2	2	2	3	3	1	165

1637

Table 1.3a: HCA 13/58 [f.1r-100v] - Signoff frequency per manuscript page, data from 1642

	1	2	3	4	5	6	7	8	9	10	Total
1-10	1	1	1	1	1	1	1	2	2	1	16
11-20	1	1	1	2	1	1	2	1	1	1	13
21-30	1	1	1	1	1	1	1	1	1	1	10
31-40	2	1	1	1	1	1	1	1	1	1	13
41-50	2	1	2	1	1	1	1	1	1	1	13
51-60	1	1	1	1	1	2	2	1	2	1	16
61-70	1	1	2	1	1	1	1	1	1	1	11
71-80	1	1	1	1	2	1	1	1	2	1	14
81-90	1	1	2	1	1	2	1	1	1	1	19
91-100	1	1	2	1	2	1	2	1	1	1	15
Total	1	1	2	1	2	1	2	1	1	1	144

1642

Table 1.4a: HCA 13/70 [f.401r-500v] - Signoff frequency per manuscript page, data from 1655

	1	2	3	4	5	6	7	8	9	10	Total
401-410	1	1	1	1	1	1	1	1	2	1	13
411-420	1	1	1	1	1	1	1	1	1	1	10
421-430	1	1	1	1	1	1	1	2	1	1	13
431-440	1	1	1	1	1	1	1	1	1	1	10
441-450	2	2	1	1	1	1	1	1	1	1	13
451-460	1	2	1	1	1	1	1	1	1	1	13
461-470	1	1	2	2	1	2	1	1	1	1	16
471-480	1	1	1	1	1	1	1	1	1	1	10
481-490	1	1	1	1	1	1	1	1	1	1	10
491-500	1	1	1	1	1	1	1	1	1	1	10
Total	1	1	1	1	1	1	1	1	1	1	113

1655

Table 1.5a: HCA 13/71 [f.1r-100v] - Signoff frequency per manuscript page, data from 1656

	1	2	3	4	5	6	7	8	9	10	Total
1-10	2	2	1	1	1	1	1	1	1	1	10
11-20	2	2	1	1	1	1	1	2	2	1	21
21-30	1	1	1	1	1	2	2	1	1	2	16
31-40	1	1	1	1	1	1	1	1	1	2	13
41-50	1	1	1	1	1	1	1	1	1	1	10
51-60	1	1	1	1	1	1	1	2	1	1	11
61-70	1	1	1	1	1	2	1	1	1	1	11
71-80	1	1	1	1	1	1	1	1	1	1	10
81-90	1	1	1	1	1	1	1	1	1	1	10
91-100	1	1	2	1	1	1	1	1	1	1	10
Total	1	1	2	1	1	1	1	1	1	1	98

1656

Table 1.1a: HCA 13/53 [f.1r-100v] - Signoff frequency per manuscript page, data from 1637

	1	2	3	4	5	6	7	8	9	10	Total
1-10	1	2	3	1	0	1	1	0	2	2	16
11-20	2	2	1	1	1	1	1	1	1	1	13
21-30	2	1	1	1	3	1	1	1	1	2	18
31-40	1	1	1	1	1	1	1	2	1	1	13
41-50	1	1	1	1	1	1	1	1	1	1	10
51-60	1	1	1	1	2	1	2	1	2	2	16
61-70	2	2	1	1	1	2	1	1	1	1	20
71-80	1	2	1	1	1	2	1	2	1	1	19
81-90	2	1	1	1	1	1	2	1	2	2	23
91-100	1	2	1	1	1	2	2	2	3	3	26
Total	1	2	1	1	2	2	2	3	3	1	165

Location of signoffs

1637

Table 1.1b: HCA 13/53 [f.1r-100v] - Signoff frequency per manuscript page & location of signatures, marks & initials, data from 1637

	1	2	3	4	5	6	7	8	9	10	Total
1-10	1	2	3	1	0	1	1	0	2	2	16
11-20	2	2	1	1	1	1	1	1	1	1	13
21-30	2	1	1	1	3	1	1	1	1	2	18
31-40	1	1	1	1	1	1	1	2	1	1	13
41-50	1	1	1	1	1	1	1	1	1	1	10
51-60	1	1	1	1	1	2	1	2	1	2	16
61-70	2	2	1	1	1	2	1	1	1	1	20
71-80	1	2	1	1	1	2	1	2	1	1	19
81-90	2	1	1	1	1	1	2	1	2	2	23
91-100	1	2	1	1	1	2	2	2	3	3	26
Total	1	2	1	1	2	2	2	3	3	1	165

1ar2ar3 - Signature 1ar2ar3 - Mark 1ar2ar3 - Initial 2ar3 - Signature and mark 2ar3 - Signature and initial 2ar3 - Mark and initial

Table 1.1c: HCA 13/53 [f.1r-100v] - Signoff frequency per manuscript page & location of mariners, data from 1637

	1	2	3	4	5	6	7	8	9	10	Total
1-10	1	2	3	1	0	1	1	0	2	2	16
11-20	2	2	1	1	1	1	1	1	1	1	13
21-30	2	1	1	1	3	1	1	1	1	2	18
31-40	1	1	1	1	1	1	1	2	1	1	13
41-50	1	1	1	1	1	1	1	1	1	1	10
51-60	1	1	1	1	1	2	1	2	1	2	16
61-70	2	2	1	1	1	2	1	1	1	1	20
71-80	1	2	1	1	1	2	1	2	1	1	19
81-90	2	1	1	1	1	1	2	1	2	4	23
91-100	1	2	1	1	1	2	2	2	3	3	26
Total	1	2	1	1	2	2	2	3	3	1	165

1ar2ar3 - Non-merchant 1ar2ar3 - Merchant (1signaff) 1ar2ar3 - Merchant (2signaff) 1,2,3ar4 - Number of signaffs on page, both non-merchant and merchant  
Maritime - Maritime (officers and non-officers), seamen, chiroquians (anchors), carpenters (anchors), coaks (anchors), pursers (anchors)

Table 1.1d: HCA 13/53 [f.1r-100v] - Signoff frequency per manuscript page & location of merchants, data from 1637

	1	2	3	4	5	6	7	8	9	10	Total
1-10	1	2	3	1	0	1	1	0	2	2	16
11-20	2	2	1	1	1	1	1	1	1	1	13
21-30	2	1	1	1	3	1	1	1	1	2	18
31-40	1	1	1	1	1	1	1	2	1	1	13
41-50	1	1	1	1	1	1	1	1	1	1	10
51-60	1	1	1	1	1	2	1	2	1	2	16
61-70	2	2	1	1	1	2	1	1	1	1	20
71-80	1	2	1	1	1	2	1	2	1	1	19
81-90	2	1	1	1	1	1	2	1	2	4	23
91-100	1	2	1	1	1	2	2	2	3	3	26
Total	1	2	1	1	2	2	2	3	3	1	165

1ar2ar3 - Non-merchant 1ar2ar3 - Merchant (1signaff) 1ar2ar3 - Merchant (2signaff) 1,2,3ar4 - Number of signaffs on page, both non-merchant and merchant