Repopulating 1661 and 1864's Venice

Research Report

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Abstract

This project is part of the “Time Machine Venice” initiative, which aims to build a digital archive for the history-rich city of Venice, with the use of data manipulation libraries in Python and ML tools. The paper will analyse two historical documents: a population Census from 1661, and a Commercial Guide of Venice from 1864, with the objective of extracting key information on the demographics and the occupation of these periods. Once the documents are digitised, we will proceed to do both simple statistical and historical analysis, but also a more in-depth look into the economical, social and cultural variables.

Contents

1. Introduction

1.1 Historical Context

The city of Venice had once a central role in European history: it was the capital of thenVenetian Republic, which extends from the Italian Peninsula and the Adriatic Sea, to even some parts of Anatolia. Nevertheless, its fortune declined at the beginning of the mid-17th century [1], as it experienced a significant decline in both its population and economic prosperity.

This decline can be attributed to various factors, such as: the loss of trade dominance, competition from other emerging powers, and also political instability. The Republic in the end fell due to Napoleon in 1797, and was formally annexed as Lombardy-Venetia to the Austrian Empire in 1815. This is the context of this research, whose goal is to study demographic shifts and economic change in Venice during the 17th and 19th centuries.

In our study, we focus on two critical historical documents: a population Census from 1661, which offers demographic insights, and a Commercial Guide from 1864, which reveals the economic and occupational landscape of the city.

1.2 Motivation

The motivation for this study stems from a desire to better understand how historical events and contexts shape and explain our modern world; this is why the preservation and the digitalisation of historical documents is essential for deepening the understanding of the modern world, moreso in a historically important city such as Venice.

By examining these two documents, we can uncover how institutional changes influenced demographic shifts and economic opportunities, particularly for marginalised communities such as the Jewish population. The historical narrative often overlooks the voices of ordinary people and businessmen, and therefore, our analysis seeks to amplify these voices in a democratic way, by analysing data that highlights their lived experiences during periods of substantial transformation.

Furthermore, this research is driven by a commitment to harnessing modern methodologies to extract meaningful insights from historical texts. We will both analyse the limit of modern technology, by deciphering manually the first document, while utilising Optical Character Recognition (OCR) and active learning tools like INCEption in the second document.

1.3 Scope and Objectives

The final aim of bridging the gap between past and present, revealing how even the most mundane historical records can yield invaluable insights into the socio-economic fabric of Venice. This process, in conclusion, can be seen as a democratisation of both culture and historical knowledge, but also in the form of empowering the common people in the historical context.

2. Methodology

2.1 First document: CVAT

In the First Document from 1661 (F. 2.1), all the records were handwritten with cursive style, making the use of OCR (optical character recognition) impractical, since each person had a different writing style; furthermore, in this case, our object of interest was mostly the name of the streets, which was indistinguishable from other irrelevant data in the document. Manual job was, therefore, necessary for the digitalisation of the document.

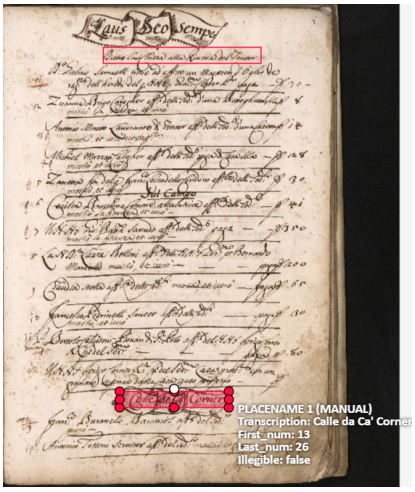
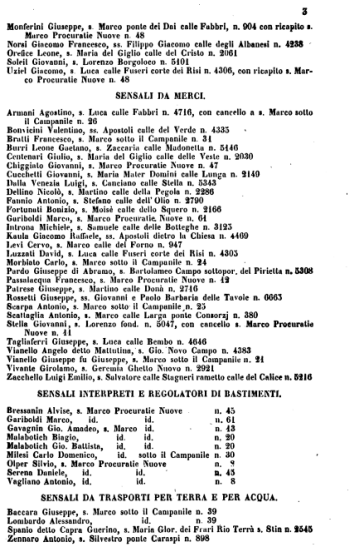


Figure 2.1: First historical document annotation with CVAT

2.2 Second document: OCR

For the Second Document from 1864 (F. 2.2), as it was used for commercial use, the print was employed, making the use of OCR possible. Furthermore, each entry in the document represented a business and its owner(s), making the use of this technology very practical.



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Monferini Giuseppe, s. Marco ponte dei Dai calle Fabbri, n. 904 con ricapito s. Marco Procuratie Nuove n. 48
Norsi Giacomo Francesco, ss. Filippo Giacomo calle degli Albanesi n. 4238
Orefice Leone, s. Maria del Giglio calle del Cristo n. 2061
Soleil Giovanni, s. Lorenzo Borgoloco n. 5101
Uziel Giacomo, s. Luca calle Fuseri corte dei Risi n. 4306, con ricapito s. Marco Procuratie Nuove n. 48

SENSALI DA MERCI.

Armani Agostino, s. Luca calle Fabbri n. 4710, con cancello a s. Marco sotto il Campanile n. 26
Bottvicini Valentino, ss. Apostoli calle del Verde n. 4335
Brulli Francesco, s. Marco sotto il Campanile n. 34
Burri Leone Gaetano, s. Zaccaria calle Madonetta n. 5146
Contemari Giulio, s. Maria del Giglio calle delle Veste n. 2030
Chiggiato Giovanni, s. Marco Procuratie Nuove n. 47
Cucchetti Giovanni, s. Maria Mater Domini calle Lunga n. 2140
Dalla Venezia Luigi, s. Canciano calle Stella n. 5343
Dellino Nicolò, s. Martino calle della Pegola n. 2286
Fannio Antonio, s. Stefano calle dell' Olio n. 2790
Fortunati Romano, s. Moisè calle dello Squero n. 2166
Garibaldi Marco, s. Marco Procuratie Nuove n. 61
Istrona Michiele, s. Samuele calle delle Botteghe n. 3125
Kaula Giacomo Raffaele, ss. Apostoli dietro la Chiesa n. 4409
Levi Cervo, s. Marco calle del Forno n. 947
Luzzatti David, s. Luca calle Fuseri corte dei Risi n. 4305
Morbiato Carlo, s. Marco sotto il Campanile n. 24
Pardo Giuseppe di Abramo, s. Bortolomeo Campo sottopor. del Piricita n. 5308
Passalacqua Francesco, s. Marco Procuratie Nuove n. 13
Pairese Giuseppe, s. Martino calle Donà n. 2746
Rossetti Giuseppe, ss. Giovanni e Paolo Barberia delle Tavole n. 6663
Scarpa Antonio, s. Marco sotto il Campanile n. 25
Scaltaglia Antonio, s. Marco calle Larga ponte Consorzj n. 380
Stella Giovanni, s. Lorenzo fond. n. 5047, con cancello s. Marco Procuratie Nuove n. 44
Tagliaferri Giuseppe, s. Luca calle Bembo n. 4646
Vianello Angelo detto Mattutina, s. Gio. Novo Campo n. 4383
Vianello Giuseppe fu Giuseppe, s. Marco sotto il Campanile n. 24
Vivante Girolamo, s. Geremia Ghetto Nuovo n. 2921
Zacchello Luigi Emilio, s. Salvatore calle Stagneri rametto calle del Calice n. 5216

SENSALI INTERPRETI E REGOLATORI DI BASTIMENTI.

Bressanin Alvise, s. Marco Procuratie Nuove n. 45
Garibaldi Marco, id. id. n. 61
Gavagnin Gio. Amadeo, s. Marco id. n. 43
Malabotich Biagio, id. id. n. 20
Malabotich Gio. Battista, id. id. n. 20
Milesi Carlo Domenico, id. sotto il Campanile n. 30
Olper Silvio, s. Marco Procuratie Nuove n. 4
Serena Daniele, id. id. n. 45
Vegliano Antonio, id. id. n. 8

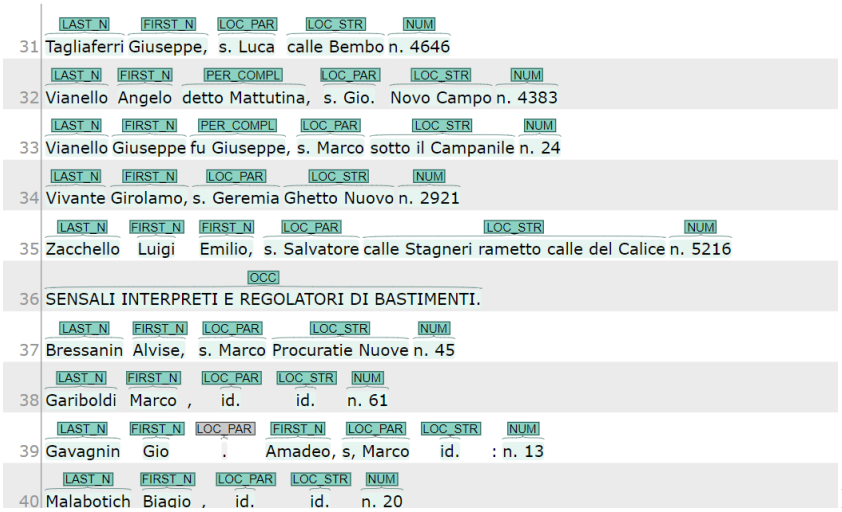
SENSALI DA TRASPORTI PER TERRA E PER ACQUA.

Baccara Giuseppe, s. Marco sotto il Campanile n. 39
Lombardo Alessandro, id. n. 39
Spanio detto Capra Guerino, s. Maria Glor. dei Frari Rio Terrà s. Stin n. 2545
Zennaro Antonio, s. Silvestro ponte Carraspi n. 898

Figure 2.2: Second historical document

2.2 Second document: INCEpTION

In this part, we employ the use of“Named Entity Recognition” (NER): we use a token-based tool to tag each word in a specific category (Last Name, First Name, Parish, Street, …), so that later we can easily construct and analyse data. (F. 2.3)



	LAST_N	FIRST_N	LOC_PAR	LOC_STR	NUM
31	Tagliaferri	Giuseppe,	s. Luca	calle Bembo	n. 4646

	LAST_N	FIRST_N	PER_COMPL	LOC_PAR	LOC_STR	NUM
32	Vianello	Angelo	detto Mattutina,	s. Gio.	Novo Campo	n. 4383

	LAST_N	FIRST_N	PER_COMPL	LOC_PAR	LOC_STR	NUM
33	Vianello	Giuseppe	fu Giuseppe,	s. Marco	sotto il Campanile	n. 24

	LAST_N	FIRST_N	LOC_PAR	LOC_STR	NUM
34	Vivante	Girolamo,	s. Geremia	Ghetto Nuovo	n. 2921

	LAST_N	FIRST_N	FIRST_N	LOC_PAR	LOC_STR	NUM
35	Zacchello	Luigi	Emilio,	s. Salvatore	calle Stagneri rametto calle del Calice	n. 5216

	OCC
36	SENSALI INTERPRETI E REGOLATORI DI BASTIMENTI.

	LAST_N	FIRST_N	LOC_PAR	LOC_STR	NUM
37	Bressanin	Alvise,	s. Marco	Procuratie Nuove	n. 45

	LAST_N	FIRST_N	LOC_PAR	LOC_STR	NUM
38	Gariboldi	Marco ,	id.	id.	n. 61

	LAST_N	FIRST_N	LOC_PAR	FIRST_N	LOC_PAR	LOC_STR	NUM
39	Gavagnin	Gio	.	Amadeo,	s, Marco	id.	: n. 13

	LAST_N	FIRST_N	LOC_PAR	LOC_STR	NUM
40	Malabotich	Biagio ,	id.	id.	n. 20

Figure 2.3: INCEpTION

2.2 Second document: Data Manipulation

The Python library “pandas” and other libraries are to be used for information processing:

- **Normalisation**: normalise and find the correct name, surname, name of the parish, and name of the street across all the data. In our case, we used a modified Levenshtein distance, aimed at the Italian language: for example, the Italian surnames “Vianello” and “Vianelli” are nearly identical, and differ only by the last vocal. Therefore, a normalisation of surnames without regard to the last vocal would increase accuracy.
- **Identity detection**: the symbol “i.d.” (idem) found in the document indicates that the data being referenced is a repetition of the previously mentioned information (same as above).
- **Exception handling**: in some cases, the same business may have more owners, the name of the street may not be specified, or there might be legal constraints (e.g. the owner may still be a minor).

We now can put them in a final Excel file.

3. Result

3.1 Geocoding

To visualise the result on a map, we can use OpenStreetMap and Google Maps’ API to pinpoint to the modern version of the street, provided the name did not undergo a dramatic change. Therefore we create an interactive map displaying all the information. (F. 3.1)

Figure 3.1: Geocoding for the parishes of S. Polo, S. Maria ai frari, S. Cassiano, S. Silvestro, S. Giacomo dall’Orio

3.2 Demographic graphs

We now use MATLAB and other tools to create simple graphs, such as the top most common occupations and surnames. (F. 3.2, 3.3)

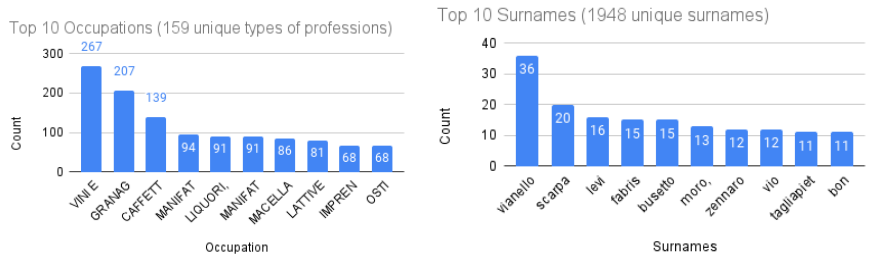


Figure 3.2, 3.3

3.3 Ethnicity analysis

Through automatic pattern recognition, web scraping with Selenium and BeautifulSoup libraries in Python, we can estimate the ethnic composition of Venice in 1864 based on the origin of surnames of the businesses. The data may contain biases in terms of overrepresentation of certain groups (e.g. the Jewish community may be more involved in certain professions), or the misclassification of surnames (e.g. Germanic instead of Jewish).

Please note that the classification is made for the sake of simplicity, and is not representative. For instance, the term “Germanic” was used to encompass not only Austrian rulers but also people from Prussia, the Netherlands, and other related regions. Similarly, “Slavic" was used to group individuals mostly from the Balkans, areas where Venice once held territories, as well as other territories of the Austrian Empire. Finally, “Others” includes surnames with unknown origin or were difficult to classify.

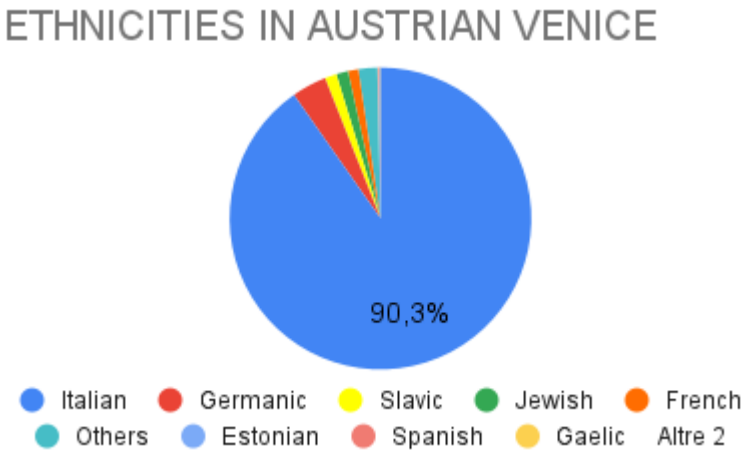


Figure 3.4: Estimated ethnic composition of 1864 based on businesses

3.4 The Jewish community

To study the Jewish community more carefully, we can notice how after the arrival of Napoleon, most of the restriction against the people of Jewish origin were lifted [2]: the location of the Jewish businesses were originally limited only to the “Cannaregio sestiere”, but after 1797 they could expand their businesses on the whole island [3]; and the result is visible in 1864 is the diffusion of the businesses of Jewish origin in more parts of Venice [4]. (F. 3.5)

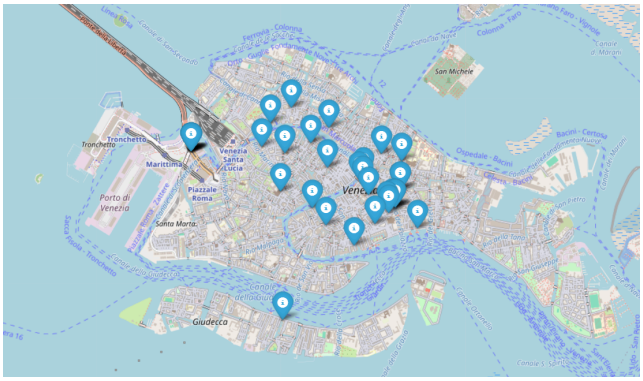


Figure 3.5: Some businesses of the Jewish community

4. Conclusion

In conclusion, this study has demonstrated how a combination of historical document analysis, modern digital tools, and careful data processing can reveal new insights into the socio-economic landscape of Venice in the 17th and 19th centuries. By bridging the past with present technologies like OCR, geocoding, and pattern recognition, we have uncovered key demographic trends and the influence of historical changes, especially the marginalised groups such as the Jewish community. This project highlights the value of preserving and digitising historical records to enhance our understanding of Venice's rich history.

5. Acknowledgment

I would like to extend my deepest gratitude to my supervisor Isabella di Lenardo through her invaluable support and insight during the project, and I would also like to thank the DHLAB for accommodating me this summer for such an incredible opportunity.
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6. References

[1]*Crisis and change in the Venetian economy in the sixteenth and seventeenth centuries*. (n.d.). Google Books. https://books.google.ch/books?hl=en&lr=&id=wTr-AQAAQBAJ&oi=fnd&pg=PP1&dq=venetian+decline&ots=34PKXZea8h&sig=peCAUKxaQHzUBl2kT8RvniThACg&redir_esc=y#v=onepage&q=venetian%20decline

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Python library (outdated), possible extension for surname’s origin guesser
https://github.com/Kyubyong/name2nat