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Oceanic Circuits in Portuguese America (between the Eighteenth and the Beginning of the Nineteenth Centuries): Mapping Political Communication through the Digital Humanities

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The aim of this article is to present and discuss the creation process of the Oceanic Circuits database, centred on the mapping and analysis of petitions sent from Portuguese America to the *Conselho Ultramarino* (Overseas Council) and the *Secretário de Estado da Marinha e do Ultramar* (Secretary of State of the Navy and Overseas Territories) between 1736 and 1808. It proposes a reflection on the theoretical and methodological possibilities resulting from interdisciplinary dialogue between the areas of History and Data Systems. Initially, we present the historical sources held in the *Arquivo Histórico Ultramarino* (Overseas Historical Archive) in Lisbon that were selected for the research with the purpose of evidencing some of the main questions covered in the study, both in historiographic terms and in relation to the quantity and complexity of the data involved. Following this, we discuss the database pilot project, which was developed using a *low code* tool, signalling the potentials and limits of the application used. Finally, we look at the database specifically developed for an interdisciplinary team, discussing relevant aspects, as well as some of its characteristics.

L'objectif de cet article est de présenter et de discuter le processus de création de la base de données Oceanic Circuits, centrée sur la cartographie et l'analyse des pétitions envoyées depuis l'Amérique portugaise au *Conselho Ultramarino* (Conseil d'Outre-Mer) et au *Secretário de Estado da Marinha e do Ultramar* (Secrétaire d'État de la Marine et des Territoires d'Outre-Mer) entre 1736 et 1808. Il propose une réflexion sur les possibilités théoriques et méthodologiques découlant du dialogue interdisciplinaire entre les domaines de l'Histoire et des Systèmes de données. Dans un premier temps, nous présentons les sources historiques conservées à l'*Arquivo Histórico Ultramarino* (Archives

Historiques d'Outre-Mer) à Lisbonne, sélectionnées pour la recherche, afin de mettre en évidence certaines des principales questions abordées dans l'étude, tant en termes historiographiques qu'en relation avec la quantité et la complexité des données impliquées. Ensuite, nous discutons le projet pilote de la base de données, développé à l'aide d'un outil low code, en signalant les potentialités et les limites de l'application utilisée. Enfin, nous abordons la base de données spécifiquement développée pour une équipe interdisciplinaire, en discutant les aspects pertinents ainsi que certaines de ses caractéristiques.

The *Oceanic Circuits* Project aims to map and analyze the petitions (demands, requests, solicitations, complaints, etc.) sent from Portuguese America to the *Conselho Ultramarino* (Overseas Council) and the *Secretário de Estado da Marinha e do Ultramar* (Secretary of State of the Navy and Overseas Territories) in Lisbon, between the middle of the eighteenth century and the beginning of the nineteenth. To the contrary of what may be imagined, there was frequent communication between the American colonies and the Iberian Peninsula, resulting in a sea of papers crossing the ocean on a daily basis. Even though the times were different, and the material sent and the responses to this took much longer than the current immediacy, petitions were always answered by royal agents or bodies. Determining to what extent the subjects of the Portuguese king, through their individual and collective demands, participated in the institutional paths for the construction of policies for their territories and how they participated, is one of the most important questions that the Project intends to discuss.

The unprecedented effort to map petitions and their responses jointly, with the purpose of problematizing imperial judicial and political communication, could only be conceived using a digital tool that can store the most relevant data. For decades the Human Sciences have taken advantage of digital tools, ranging from the use of textual sources (historic documents) to an enormous amplitude of historic research using other media, which definitively have altered the conditions of the production of knowledge in the Humanities (Sula and Hill 2019, 190–206). It is thus unsurprising that it is common nowadays to think of themes that make use of some type of digital tools, even without realizing it. In this sense, the amplitude of initiatives that can be covered by the expression Digital Humanities is enormous, ranging from data production, the sharing of this, artificial intelligence tools, as well as the possibility of collaborative research (the bibliography is enormous; at the very minimum, see Alves 2016; Svensson et al. 2016).

In this sense, it is important to highlight, from the point of view of historical investigation, that digital methods and tools are causing significant modifications in the way historians research, teach, and write history, whether in the stricter sense of the use of computer resources and cyberspace for historiographic production or the formulation of new research methodologies and problems with significant epistemological implications for disciplinary practices (cf. Lopes 2018; Bresciano and Gil 2015) under the auspices of what some authors have conceptualized as a "digital turn" in the historiography (Bresciano and Gil 2015, 7–14). Much research has been done in Portuguese America History based on new forms of communication and historical knowledge through the use of digital technologies (Bresciano and Gil 2015, 7–14; Alves 2016). This is the case of the incorporation of geographic information systems

in historical investigations. An example of this is the "Digital Atlas of Portuguese America," developed by the Laboratory of Social History of the University of Brasília, under the coordination of Tiago Luís Gil (University of Brasília) and Leonardo Brandão Barleta (University of Nebraska, Omaha). This is a collaborative digital cartography tool that uses I3GEO software (developed by the Ministry of the Environment) that produces maps with urban, population, and movement data from Brazil between 1500 and 1800 (the Project site can be consulted at Atlas Digital da América Lusa 2020; for a history/outline of the Project and possibilities of analyses derived from it, see Gil 2019).

Another significant area of activity of historians in the interface with the Digital Humanities consists of the construction and, eventually, the provision of historical databases. Questions associated with the forms of organization of historical information and the formulation of analytical categories can be found at the centre of theoretical and methodological reflections on the craft of the historian, equally constituting the "core of the creation process of the database" (Barleta 2015, 166). These consist of exemplary initiatives such as the FICHOZ project, prepared by a group of researchers working on the political structures of the eighteenth-century Spanish monarchy. From a prosopographical approach, this focuses on the treatment and analysis of the life trajectories of different historical actors and the mapping of existing social relations between them (in relation to the Project and its history, see Dedieu 2018). Another is the "Slave Voyages" database and website, resulting from an international research effort to unite in a single data set various historical sources, with varied origins and locations, related to the transatlantic slave trade (SlaveVoyages 2024).

For the Oceanic Circuits projects, we especially drew inspiration from database projects such as these, designed to share information on a broad scale and developed in collaborative forms, as well as dealing with sources of information of various nature and formats (Dedieu 2018; Borges 2017)—specifically, those which would allow reflections on methodological alternatives to make feasible the ordered reconstitution of documentary paths and in this way, especially for our case, the communication circuit, from the initial request, how it was processed, and the decisions made for the case; a significantly innovative proposal in the architecture of databases and the relationship of the historical information available for the theme.

Taking this into account, our objective in this article is to demonstrate how we conceived of a path to construct a digital tool able to map Portuguese imperial communication in the period studied. The text is divided into three parts. First, we present the historic sources used and their magnitude and complexity, highlighting two projects that deal with the theme in question, one of them in Digital Humanities. After this, we discuss how to prepare a pilot project for a database using a *low code*

tool, *Filemaker*, which showed significant limitations for our purposes. Finally, we look at Oceanic Circuits database, produced by an interdisciplinary team in which all the researchers whose names are on this document were involved.

1. Our historic sources

Studies on colonial empires form part of a broad historiographic tradition for the modern period. As it is a question that is well established in the Anglo-Saxon universe, as well as for the Spanish monarchy and the Dutch republics, there are significant works for the Portuguese case, more recently in perspectives integrating the Iberian space (Bouza, Cardim, and Feros 2020; Black 2015; Elliot 2006; Israel 1990; Boxer 1969). In relation to the analyses of demands coming from overseas, we synthesize the act of sending *petitions*—roughly speaking, any demand or complaint coming from some person or collective to authorities recognized as superior—as a primordial form of the political communication of subjects with monarchs (Slemian 2023). In relation to this, the profusion of studies in this area in the Anglo-Saxon world is incomparable, a historiography which has called attention to the specificity of petitions in the modern epoch, as well as the importance of analyzing the responses that these produce at this moment (Israeli 2023; Zaret 2019; Almbjär 2019). For the Iberian universe, there are very few analyses in this sense (Masters 2023). Our Project consists of the unprecedented proposal to create an instrument for its mapping in the Portuguese case as a central point of imperial political communication.

The most significant documentary set for the area can be found in the *Arquivo Histórico Ultramarino* (AHU; Overseas Historical Archive), located in Lisbon—certainly one of the archival institutions best known to historians whose research is concerned with Portuguese colonial governance in the Early Modern period. The institution preserves the documentation associated with the two main agencies in the Portuguese Court charged with overseas subjects under the auspices of the Empire: namely, the *Conselho Ultramarino* (Overseas Council), created in 1642–1643, and the *Secretário de Estado da Marinha e do Ultramar* (Secretariat of State of the Navy and Overseas Dominions), created in 1736. Part of this is available *online* in the platform created by the *Resgate Barão do Rio Branco* Project (in relation to the Project, see Boschi 2018; the digitalized documentation can be found at Projeto Resgate Barão do Rio Branco 2024).

This involves an extensive and multifaceted documentary *corpus* whose complexity mirrors not only the broad temporal spectrum contemplated, or the at times tenuous distinctions between the documents produced under the auspices of the Council or the Secretariat, but above all, the many internal circuits and paths followed by each of these bodies to the colonies. Roughly speaking, we can speak of two sets of documents.

First, petitions, accounts, letters, and representations (originals or copies), which were addressed to the two institutions, as well as some procedural documents (such as consultations, provisions, etc.), which are available in the archives as the so-called *Avulsos* (or miscellaneous documents). In turn, these form a documentary series divided into various subseries, organized, above all, on geographic and chronological criteria (*Avulsos* from Minas Gerais, Bahia, Goiás, etc.) and characterized by a fragmentary nature in the sense that they include loose, segmented, and/or incomplete documents. Second, systematic information about how these were dealt with and resolved are contained in the numerous *Codices*: register books of the *Conselho Ultramarino* and the Secretariat organized in series, such as the Register Books for Consultations (Parties, Captaincies, Royal Service, Mercies), Register Books for Provisions (Writs), Register Books for Orders of Parties, Register Books for Royal Letters, provisions, and other orders, which indicate the internal routes of transmission (in relation to the history and archival organization of the Overseas Historical Archive and the Resgate Project, see Martins 2018; Boschi 2018; in relation to the means of transmission, Fernandes 2022).

Despite the enormous volume of documents and their typological diversity, there are still few studies concerned with the assessment and proposal of systematic relationships between these documentary sets. Although some important general surveys have been made, the majority of these were based on the *Avulsos* documentation of the *Arquivo Histórico Ultramarino*, the set explored in most detail in the historiography. Exemplary in this sense is the proposal for the formation of a database with around 27,000 records of correspondence between the *Conselho Ultramarino* and the *Secretário de Estado da Marinha e do Ultramar* and Luso-American and African territories in sampling periods between 1640 and 1807, created by teaching staff and students from various Brazilian and Portuguese universities. This resulted in the publication of *Um reino e suas repúblicas no Atlântico. Comunicações políticas entre Portugal, Brasil e Angola nos séculos XVII e XVIII* (*A Kingdom and Its Republics in the Atlantic: Political Communications between Portugal, Brazil, and Angola in the Seventeenth and Eighteenth Centuries*; Fragoso and Monteiro 2017). Centred especially on the documentation that circulated among municipal chambers (which also involved the Kingdom of Portugal and the Azores) and the central agencies of the monarchy, the results of this project have been highly inspiring for thinking about the connections and political communication between the monarchy and its subjects, as well as the criteria used in the database, even though readers of the book in question were not informed of this. Another project worth noting is *S.I.L.B.: Sesmarias of the Luso-Brazilian Empire Platform* (SILB 2024). This produced (and made available) a database of the documentation contained in *Arquivo Histórico*

Ultramarino, as well as other sources. Coordinated by Carmen Alveal, a researcher at the Federal University of Rio Grande do Norte, part of the project is a research partnership involving the construction of an information database of land donations in Portuguese America throughout the colonial period, with open access to anyone.

A more portentous attempt at making an interface between the methodological and analytical possibilities of the documentation held in the *Arquivo Histórico Ultramarino* and the Digital Humanities is the project recently developed by Agata Bloch, Demival Vasques Filho, and Michal Bojanowski (Bloch, Vasques Filho, and Bojanowski 2022). Considering the problem of how to process the broad and non-structured documentary *corpus* (manuscript sources which include various papers of different natures due to the processes used at the time), techniques were created for processing the original language based on the archival cataloguing available, seeking to reconstruct networks of power that connect political agents based in Lisbon and the different actors scattered among the colonial territories. Its documentary base consisted of the administrative correspondence catalogued in the *Arquivo Histórico Ultramarino* (around 170,000 records) and preserved in the *Avulsos* documents for the 1610–1833 period. It is worth noting that the latter is the only documentary set in the Project *Resgate* site that allows searches with an OCR tool based on archival information in the corresponding records. This project, essentially aimed at social history, took great care in this *decoupage*, achieving very suggestive results.

Our Project takes into account both of these experiences of processing data related to Portuguese political communication in the Early Modern period. However, it is also concerned with another historical problem: how the demands and requests coming from Portuguese overseas territories—in other words, its colonies—were received, processed, accepted, or rejected by the central agencies of the monarchy in Lisbon. For this, it is fundamental to look for the institutional paths and the decisions made in response to petitions submitted by subjects, whether individually or collectively, which we call *commencement*. As well as the documentation appearing in the *Avulsos* collection, it is also necessary to delve into the processing of information in the various books produced by the *Conselho Ultramarino* and the *Secretário do Ultramar*, which registered the processing of requests/petitions and the decisions related to these, in other words, the Codices. Since there is no online search instrument for these, as they are manuscript books, reading and registering them has to be done manually.

Due to the meticulous work required in the processing of these different types of data, we chose to restrict our analysis to the captaincies of Minas Gerais, São Paulo, Mato Grosso, and Goiás, as a result of the regional dynamic established between them, and to restrict the temporal focus to 1736 to 1807. The initial date is justified by the

creation of the *Secretário de Estado da Marinha e do Ultramar*, mentioned above, and more especially because it allows an answer to the question of whether its operations altered the order of decision making in relation to queries arising overseas and raised in the *Conselho Ultramarino*, a body which had existed since the seventeenth century. As has been shown, this is one of the main topics that the Project proposes to discuss and has demanded an unprecedented effort in the processing of the documentation appearing in the Codices. The choice of the final date is explained by the arrival of the Court and the prince regent D. João in Rio de Janeiro, which meant that from that date a large part of petitions from the Americas were now sent to the latter city rather than Lisbon.

The magnitude of the proposal allows for collaboration between the Project's four main researchers, one connected to the systems area, a master's student in *Universidade Autónoma de Lisboa* (Paulo Ricardo Rodrigues Bastos), and another six grant holders (Isabelly Takamatsu Nuno Diamante, Izabella Thomaz Lopes, Luiz Eduardo de Mello Gonçalves, Maísa Santos de Oliveira, Rayssa Dias da Silva Santiago, and Theo Marques de Paula) who are working in the systematization of the documentation. Furthermore, the team is responsible for entering data into the database, linked to research centred on the documentation produced by the *Conselho Ultramarino*. Moreover, there are plans to make it available to the community, something which did not occur with the projects mentioned previously. The preparation and potential of the database will be described next.

2. Potential and challenges of using a pre-designed tool: The example of FileMaker

FileMaker is a management system for a relational database developed by Claris whose main idea is to permit those interested in developing software to create their own applications, even those without experience in programming or information technology. It is a multi-platform system (running on Windows and Mac) that allows the rapid creation, without much effort, of a database integrated in a web application, which can be accepted by various users.

FileMaker was used in the construction of a pilot database in the scope of the project *Extrajudicial Petitions and the Guarantee of Rights in Overseas Territories (1750–1808)*, developed in the Federal University of São Paulo, between 2018 and 2020, by two researchers connected to the *Oceanic Circuits* (project funded by FAPESP, Process no. 2019/00456-0). At the time, it was an investigation centred on petitions and/or acts criticizing public authorities and how these demands were dealt with by the royal authorities and their representatives, through the *Conselho Ultramarino*. One of the purposes of the latter is to inventory, quantify, and categorize the forms of appeals that the petitions were part of, the "redress" demanded, and how these were dealt with and dispatched. Based on contact with the documentation held by the *Arquivo Histórico Ultramarino*, we have found the complexity of institutional circuits within the Council,

embodied in a multiplicity of documentary fonds of various types. In these terms, to reconstitute the circuits of petitions, we believe that it is essential to use tools that allow not only the ordered organization and registration of large volumes of sparse documents deployed in different fonds, series, and subseries, but also permit the establishment of relations between these different documents.

With this in mind, we decided to create a relational database in *FileMaker*. The modelling was based on specific tables to take account of the paths that the petition, request, or complaint would follow after reaching the *Conselho Ultramarino* or the *Secretário de Estado da Marinha e do Ultramar* in Portugal. Different stages in this processing can be distinguished. We call these *commencement–consultation–response*. They are contained in a relational table that we call *Relationships*. This can be seen in the fragment of the original relational database (**Figure 1**) and in the original relationship table from the first project (**Figure 2**).

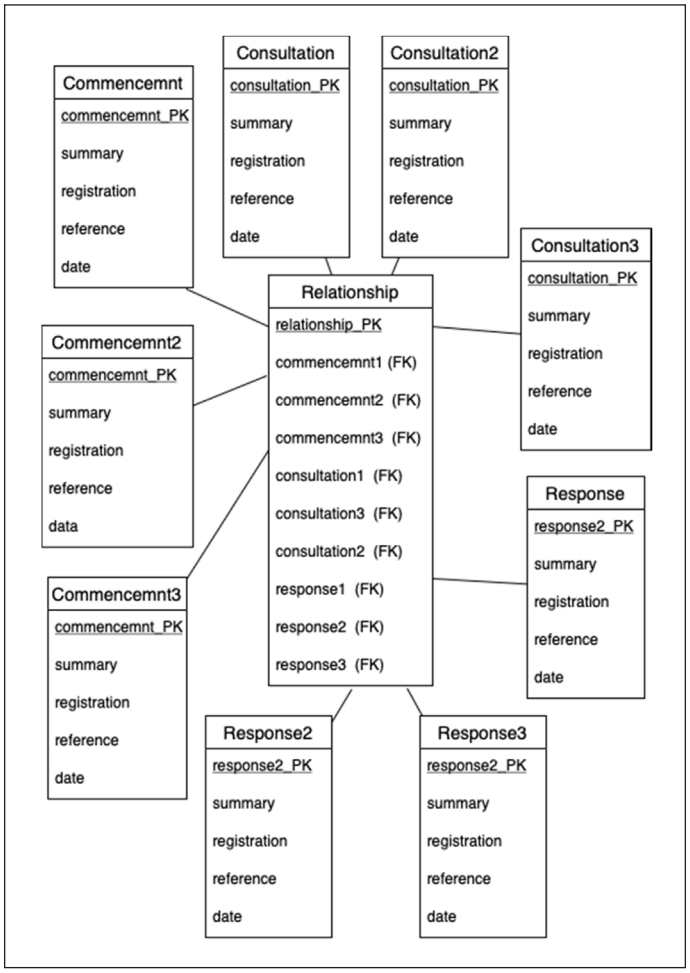

Figure 1: Fragment of the original relational database. Prepared by Valéria Pequeno.

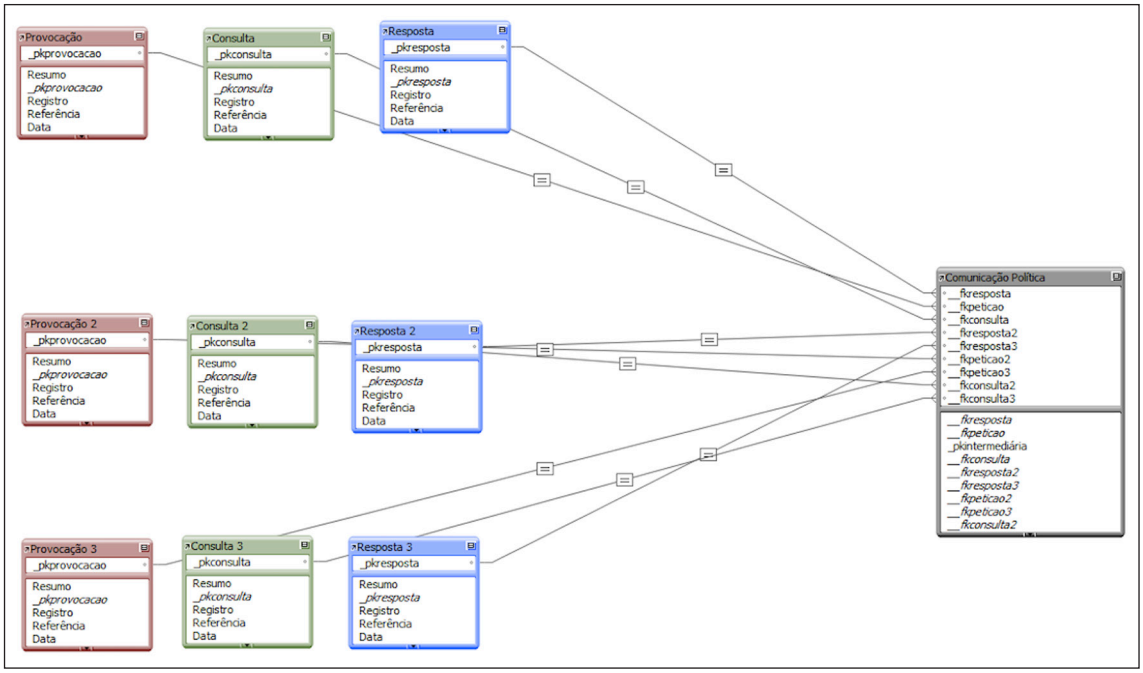

Figure 2: Relationship table from the project *Extrajudicial Petitions and the Guarantee of Rights in the Overseas Territories (1750–1808)*. Screenshot of the application developed by Renata Fernandes (copied from the original application, hence it is in Portuguese).

In the *commencement* table (*provocação* in the original), fields were created to record information about the petitioners, such as name, place of origin, data, typology of petitioner (parties, municipal councils, brotherhoods, etc.), socio-professional identification, and summary (in order to facilitate reading, **Figure 2** only shows the relation schemata with some of their attributes). The *consultation* table (*consulta*)—the moment when the demand was assessed—contains fields for the registration of data such as summary (synthetic description of the consultation), abstract, name of councillors (who participated in the consultation), royal attorneys, royal opinion, date, and type of consultation (if it "reached" the royal presence or "was sent" to the Council). In the *response* (*resposta*) table, we included a summary, information about the type of document in the source (order, provision, writs, charter, etc.), about the decision-making process (consultations, notification, etc.), typology (request for information, resolution, etc.), the authority/authorities receiving the response and their location, other tribunals or agents who participated in the decision-making circuit, as well as complementary information about the transmission routes and the legal documents created based on petitions. Moreover, this table also contains some information about *commencement* with the purpose of facilitating the crosschecking of the information in the relationship table. In each of the tables (*commencement*, *consultation*, and *response*), we also created a specific field for the documentary reference (archival notation) of the source of information, as well as the *category* field, in which we included a proposed thematic/typological

classification for each document consulted. Finally, we created in all the tables a field containing automatic sequential numbers to serve as primary keys and thus to identify each record on the table individually (a *consultation*, a *commencement*, etc.)

The relationship table was designed to provide the circuit of information for each record, using the data entered as *commencement*, *consultation*, and *response*. In a database, this is done by inserting the primary keys of other tables as external keys. Thus, the primary keys of *commencement*, *consultation*, and *response* were included in the relationship table as external keys (often called Foreign Keys by database designers). Based on these directives, the so-called "many-to-many relationships" were established, necessary to take into account the complexity of the transmission circuits of documents in the *Conselho Ultramarino*: this is because a single *commencement* could have resulted in more than one consultation and/or more than one response, or a single response can even have been related to more than one *commencement* and/or *consultation*.

To enter data in the database, we used fields with various styles of control, as can be seen in **Figure 3**: "text boxes" for the most unrepeatable fields (petitioners, summaries, documentary references, etc.); "drop-down lists" for controlled fields, but with a range of alternatives (such as recipient authorities and councillors); and a "combo box" for information with a high degree of repetition and incidence (royal attorneys, for example, with the option of selecting Crown Attorney, Treasury Attorney, or both).

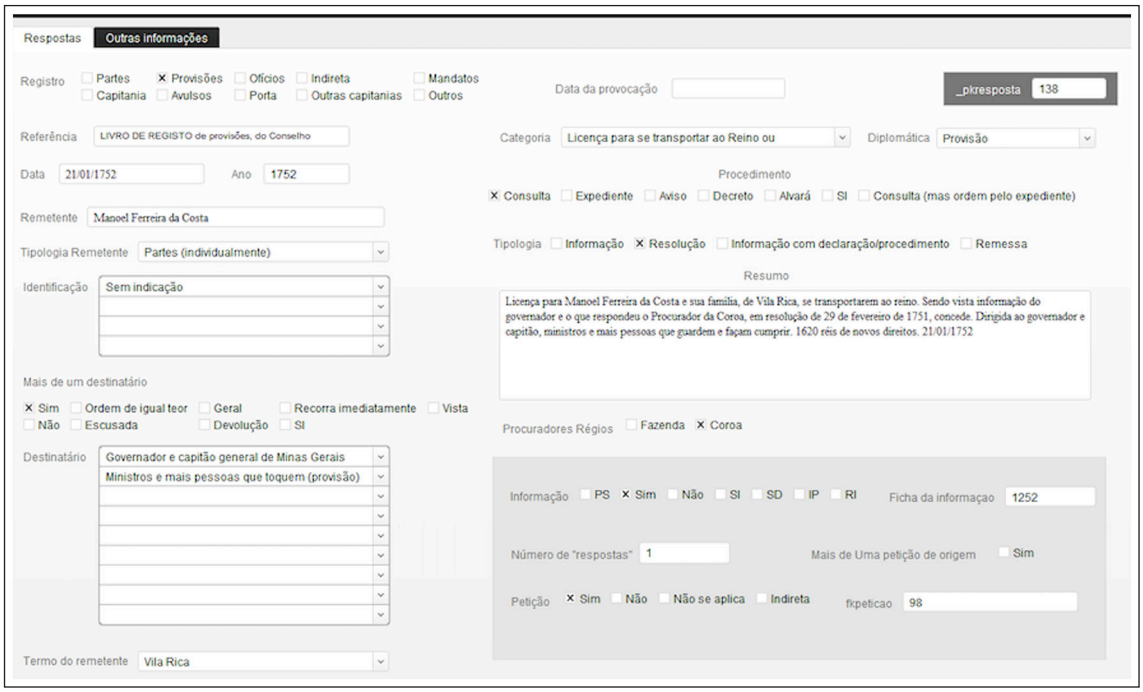

Figure 3: Response table from the project *Extrajudicial Petitions and the Guarantee of Rights in Overseas Territories (1750–1808)*. Screenshot of the application developed by Renata Fernandes.

Based on this project, *FileMaker* appears to be a tool with much potential for research in History. Its friendly interface for non-specialists in information technology, the existence of models that help in the initial modelling of the database, menus and pop-ups [RF1] that allow rapid editing in the control styles of the fields, and, above all, the administrative mechanism with a layout illustrating the relationships between the tables (relationship graph) are aspects to be highlighted. With these possibilities, a database was created with approximately 1,300 *commencement* records (petitions), 270 consultations, and 1,600 records of "responses," related to cases in the relationship table.

However, we also observed significant limitations in relation to designing a highly complex database such as ours. Essentially, there were three types of these. The first is related to the need for greater technical and specialized knowledge to make use of all the possibilities of the software. This is because the pre-made models (or initial solutions) are evidently not sufficient to deal with the particularities of a database aimed at the development of a research project in History, since they are based on the management of business data (such as purchasers, clients, and contacts; assets, inventories, and equipment; projects, events and their tasks and reports, and invoices). Furthermore, the development of our own model, although allowed by the friendly interface, requires technical knowledge both for the use of the tools made available by the software and the creation of solutions capable of taking into account the proposed relationships.

Second, *Filemaker* is commercial software with a wide range of resources available. However, its code is not open. This can result in some disadvantages, such as: (a) its license can be expensive, especially when we consider licenses for multiple users; (b) scalability, in other words, the ability to be prepared to grow, whether due, for example, to the database increasing beyond what was initially stipulated, or because the number of users grew, can be a challenge, and this can compromise the performance of our application; (c) the portability of our application depends on *Filemaker,* which can affect the migration and sharing of data with other software solutions; and (d) customizations and the development of interfaces of our application are limited to what is provided by *Filemaker*.

Third, and most importantly: the use of the application created is intimately related to the database developed. In this sense, the database project, especially when involving many associations between the data, such as ours, requires specialized knowledge so that (a) the necessary information can be easily extracted; (b) the data is not necessarily repeated between the various tables; (c) the insertion of data is done in such a way as to minimize inconsistencies; and (d) the data is easily consulted.

Although in a relational database the relationships are made in the same manner, in other words, through external keys, the limitations shown in *Filemaker* reduce the

possibility of visualizing new relationships through the data extracted. This was greatly improved in the Project we developed, which will be described below.

3. Description of the Oceanic Circuits database

Given the limitations evidenced in the database produced in *FileMaker*, we began the construction of a specific database for the Project that could improve the relationship between the information. After this, (a) we defined a clearer central line for their interconnection, and then (b) refined the moments in which the requests (petitions) of the overseas subjects were transmitted due to the possibilities that were opened to establish even more complex connections.

For the current Project, we decided to use a relational Database Management System (DBMS), PostgreSQL, and developed a web application for the usual CRUD operations (i.e., *Create, Read, Update,* and *Delete*). It is important to highlight that both the web application and the database are in a server so that the data held can easily be consulted and shared. We will give more details about the developed database and web application in the next sections.

3.1 The relational database

The DBMS chosen allows an enormous amount of data to be kept in a vast range of formats, as well as its management, allowing us, for example, to place integrity restriction rules that minimize the entrance of erroneous data into the database, thereby guaranteeing the consistency of data when this is entered by multiple users. Moreover, the system possesses various other mechanisms that allow the manipulation and security of data, as well as facilitating its sharing if necessary.

Given the complexity of the relational database and the brevity of the current Project, we decided to design the relational database schema in a traditional way. This means that we first conceived the conceptual schema, followed by the relational schema, and finally the physical schema. Thus, at this stage, we were not concerned with creating an ontology or using metadata that contains specifications of a community-endorsed standard. Our main concern was to ensure that all information was maintained in the database, and the complex relationships between the various actors were correctly captured.

As initially conceived, the database is organized around petitions (requests or complaints), which we called *commencement*, made by a person and/or a corporation (petitioner) in Portuguese America, and the actions that this petition produced after reaching the *Conselho Ultramarino* and/or the *Secretário da Marinha e do Ultramar*. In addition to the *commencement* and the *response* to it, we can conceive greater detail in relation to its process, which can involve (a) sending it to another official and/or body in

Lisbon to adopt a position on the question being dealt with (such as a Crown Prosecutor, the Royal Treasury, etc.), which we call *order* (*mandados*) due to the existence of a book with this name; (b) sending it to authorities in the Americas asking for information about the case (which we called *overseas*); (c) the opinion of the councillors of the *Conselho Ultramarino* through a *consultation*, as presented above.

We can thus imagine a "lifetime" of the processing of the petition/*commencement* in which each of the moments/stages are *milestones*, marks associated with actions produced during its process/assessment/judgment. However, this "lifetime" is far from being linear and having a predetermined sequential order, as can be observed in **Figure 4**.

The database will answer if an order or pattern is reproduced in the stages experienced in the processing decisions for each case. In other words, whether there is always a consultation for a determined subject, if the Crown Prosecutor is always consulted, if information is always requested from the overseas territory, etc.

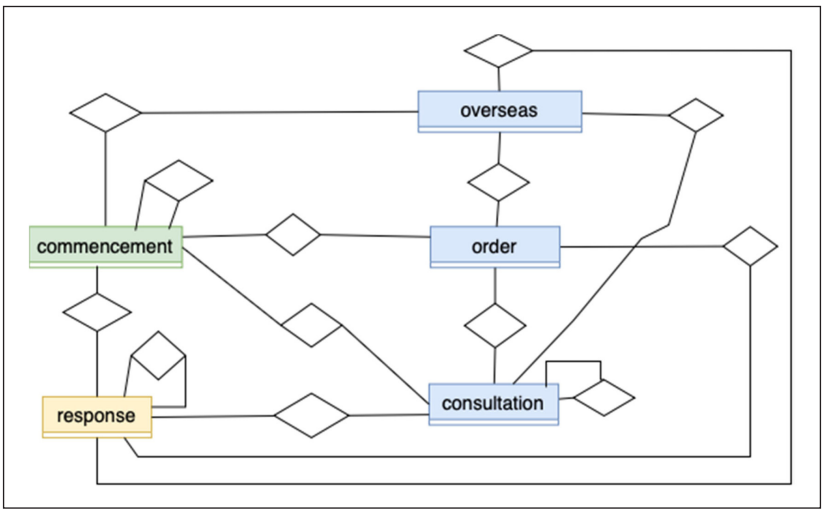

Figure 4: Entity-relationship diagram of the milestones of a petition and its relationships. Prepared by Valéria Pequeno.

Taking into account that each *milestone* is associated with a person or set of persons (petitioner[s]), the new version of the database allows us to establish a more sophisticated relationship between all of them based on the roles they performed in each case. Thus, there is space to name the petitioners, the recipients who received or forwarded petitions and responses, as well as all the people cited in the petition itself, in the supporting documents and during the processing of the case (*commencement*, *order, overseas, consultation, response*). All of this is part of a single list of names and can be used in all the stages (*milestones*), as shown in **Figure 5**.

The database thus permits (a) the identification of people who are related to each other, allowing the reconstruction of networks of personal relationships; and (b) the tracing of the history of each person in order to observe the positions they held in relation to the petitions sent to Lisbon. For a better visualization of what we want to say, imagine that the same person could have been during the "lifetime" of a petition: the petitioner at a certain moment or moments, individually or collectively; cited in a petition, including as a witness; the recipient of a royal response or a request for information.

In this way, the database stores and organizes information about individuals, corporations, and institutions that participated, to some extent, in a process of social demand (a petition and its process), collecting data about individual or collective trajectories extracted from the documentation consulted, also allowing their search by name in the database. In the specific case of people (individual petitioners), the same database also allows their grouping in *collective subjects*, through aggregators based on the markers below, as can also be seen in **Figure 5**:

- offices/positions, which we classify as civil (governor, appellant judge, judge, *provedores*, bailiffs, clerks, etc.), clerical, and military
- economic status or occupation: owner, doctor, contractor, etc.
- socio-judicial categories: widow, emancipated slave, slave, member of the household, orphan, etc.

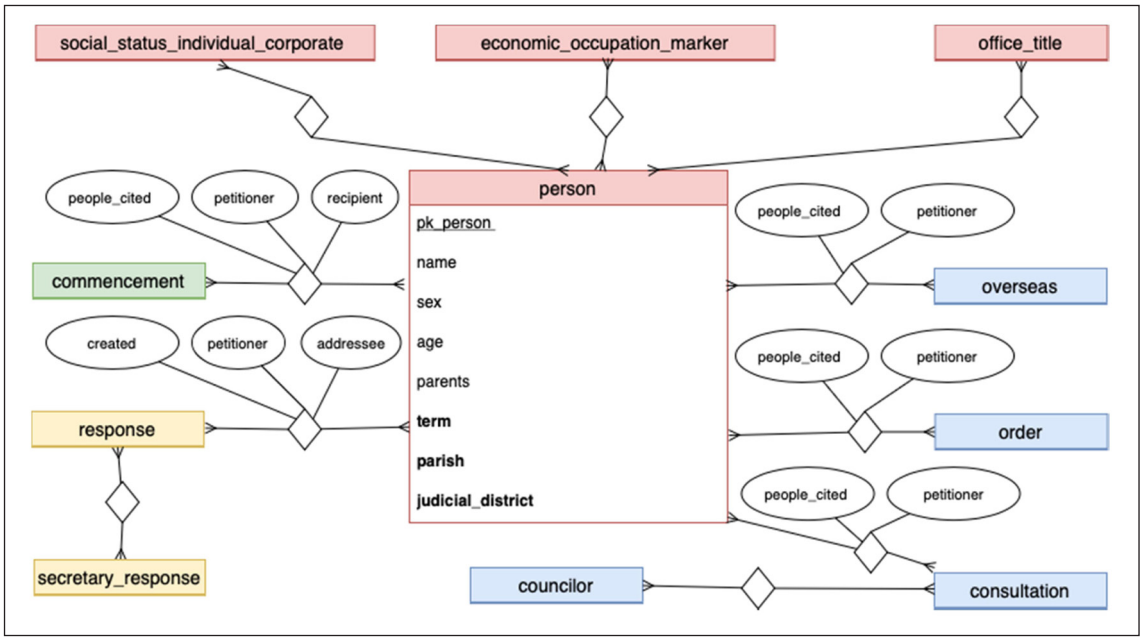

Figure 5: Entity-relationship diagram of those mentioned in the documentation consulted, petition milestones, and the relevant relationships. Prepared by Valéria Pequeno.

For each of these markers, there is a controlled list for registration and in which searches can be carried out. This permits an understanding of the main petition patterns of each of these groups over time. As can equally be seen in **Figure 5**, all this information is related to the locality in which they were produced (term, parish, judicial district), which allows control over the action and colonial spaces. As can be imagined, the captaincies possessed distinct demographics, as well as distinct forms of relationships between them, which can equally be mapped. Thus, the possibility that one day the database can have an instrument for its visualization in a map can be easily developed using its data.

In relation to the petitions, it should be noted that a single request could produce various processes and responses. One example is the case of Francisco Xavier and his wife Tereza da Purificação, residents of Minas Gerais, who presented a petition to the *Conselho Ultramarino* (Overseas Council) asking for a license to move to Portugal with their children (AHU-Minas Gerais, cx. 55, doc. 63). While being processed in the *Conselho Ultramarino*, the first dispatch (1st *response*), was issued in August 1750, consisting of an order to the governor of the captaincy to give his opinion on the case (Codex 193, 285), which he did on April 15, 1751 (AHU-Minas Gerais, cx. 55, doc. 63). After the order and the reception of the governor's opinion, favourable to the request being granted, the petition moved to a second stage, in which royal prosecutors (Crown and Treasury) received it and stated that "justice had been done." Next, the third stage of the process began with a consultation of the *Conselho* on February 4, 1752, also favourable to the request. In March of the same year, by royal resolution, leave to move was granted to the petitioners (Codex 63, 105). Finally, in March 1753, the license to move to the Kingdom was issued (2nd *response*) (Codex 102, 110–1). The various procedures and responses involved in this example were summed up in a diagram shown in **Figure 6** to provide better understanding.

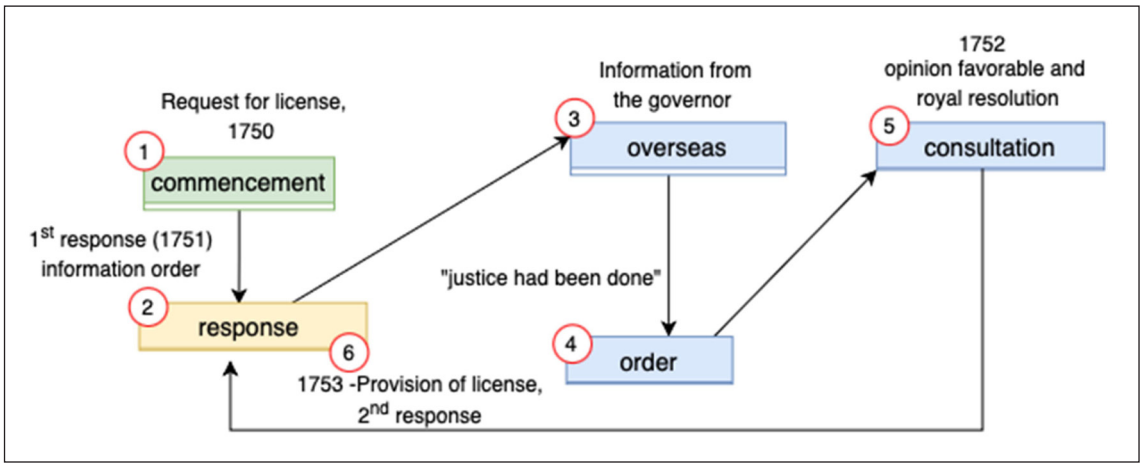

Figure 6: Example of the relationships between the procedures and responses to the petition of Francisco Xavier and his wife. Prepared by Valéria Pequeno.

All of this information was obtained from different notations and documentary fonds. It can now be stored, organized, and related in an easy rapid, and detailed form, through the documentary cross-referencing permitted by the developed database. This currently possesses 65 tables, of which 44 are exclusively used to establish relationships between the data. **Figure 7, Figure 8**, and **Figure 9** show a compressed relational schema of the database developed. Each figure shows only the relations, also called tables (represented as rectangles), without their attributes, and the relationship (represented as lines) between them. Different colours are used to facilitate the identification of the tables in each figure. Thus, green rectangles are used for tables directly related to the commencement, blue rectangle for tables directly related to the consultation, yellow rectangle for tables directly related to the response, and pink for all other tables.

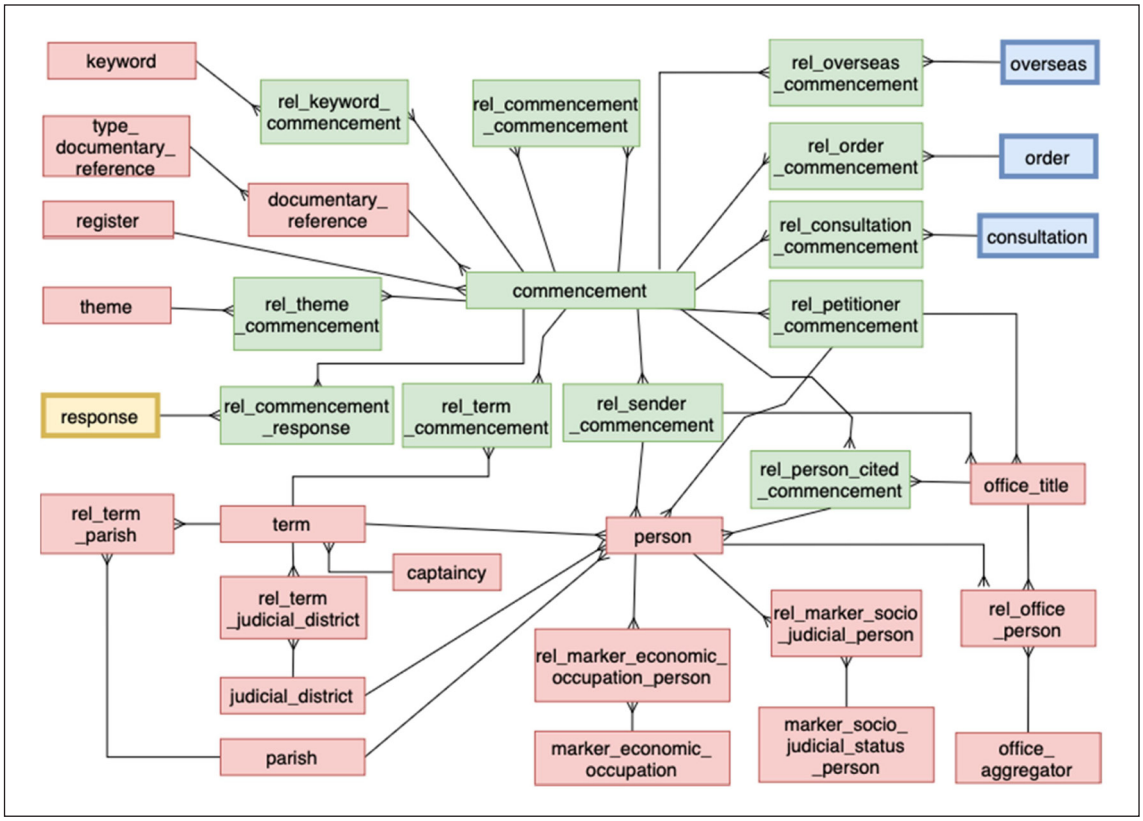

Figure 7: Relational database fragment (emphasis on commencement). Prepared by Valéria Pequeno.

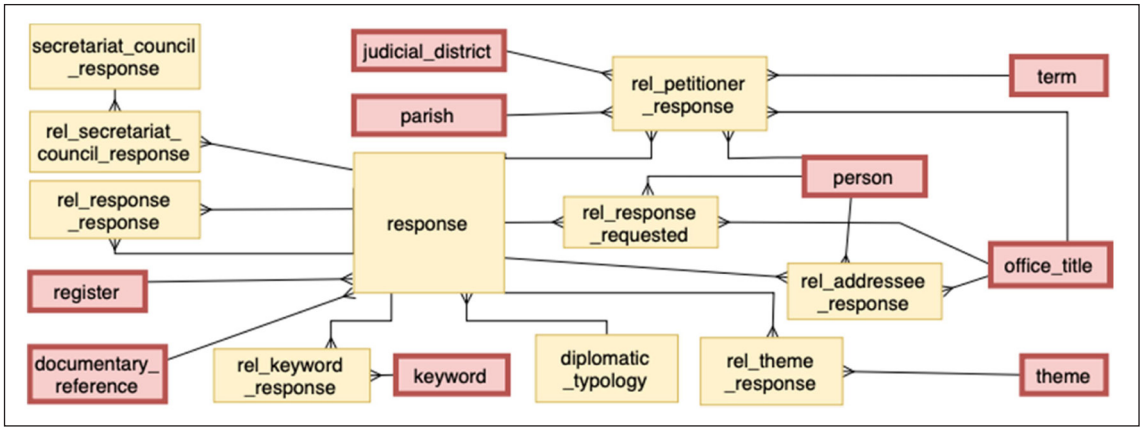

Figure 8: Relational database fragment (emphasis on response). Prepared by Valéria Pequeno.

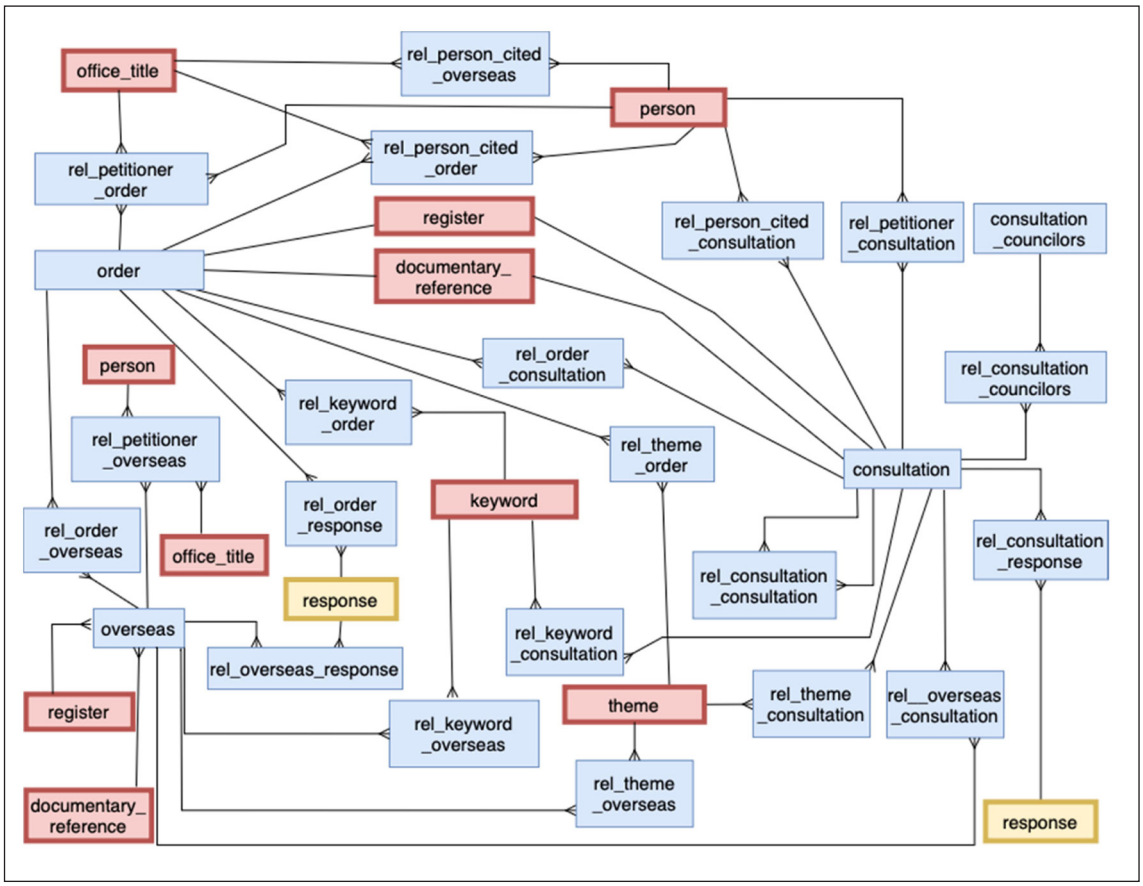

Figure 9: Relational database fragment (emphasis on consultation). Prepared by Valéria Pequeno.

Although the current database development project has not focused on FAIR principles (Wilkinson et al. 2016), leaving this for the future, each piece of data within a table has a unique identifier that will be used later for the generation of the global unique identifier; information about the origin of the collection is maintained; and we create metadata describing our database in the format of a data dictionary to make it easier to understand what is stored in each table. The data dictionary is metadata that contains descriptions of each table and each attribute of these tables, as well as some information we consider useful about the database. (It can be consulted at Pequeno et al. 2024; unfortunately, it is in a human-readable format only.)

We intend to put our dataset in an open repository in the near future, which will be in line with FAIR principles. We plan to use existing vocabularies in the domain we are working on, such as Dublin Core (DCMI 2024), FOAF (Brickley and Miller 2014), DBpedia (DBpedia [2008] 2024) and Aragopedia (Aragopedia [2014] 2024). Terms that are not found in these ontologies and are specific to our domain will be created and publicly available. Once we have created the domain ontology containing all terms used in our database schema, we will use approaches such as the one presented by Vidal and colleagues (Vidal et al. 2022) to create an Enterprise Knowledge Graph (EKG) from our relational database and integrate it with other related projects, such as one *Atlas Digital da América Lusa* (Atlas Digital da América Lusa 2020). The EKG will, therefore, guarantee the availability and integration of data in other datasets and systems, and can be consulted by humans and machines.

3.2 The web application

The web application was developed in Java and Node.JS and allows us to interact with the database in a much more friendly manner, without the need to access it directly. Various interfaces were constructed, with pop-up windows and help fields that greatly assist the process of inserting data by anyone. **Figure 10**, for example, presents the screen for inserting *commencement* data (*provovação*) number 18. In this window, in addition to including specific data about the *commencement*, we can insert other related data, such as people mentioned and indications of all documents (response, consultation, overseas, and order) related. **Figure 11** show examples of pop-ups that help the user when entering data.

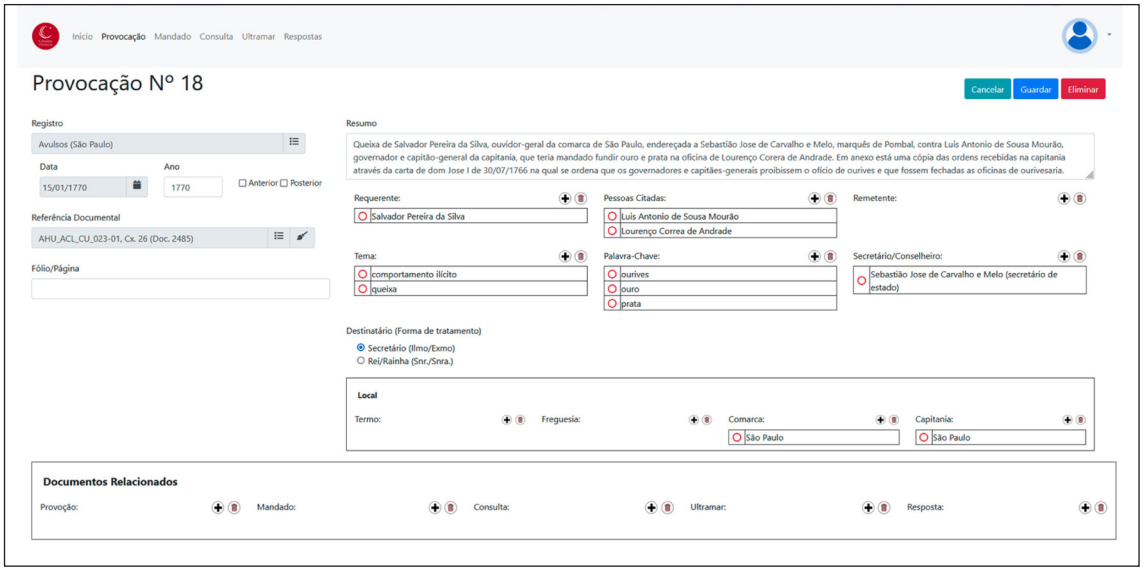

Figure 10: Web application: Insertion of a commencement. Screenshot of the application developed by Paulo Bastos.

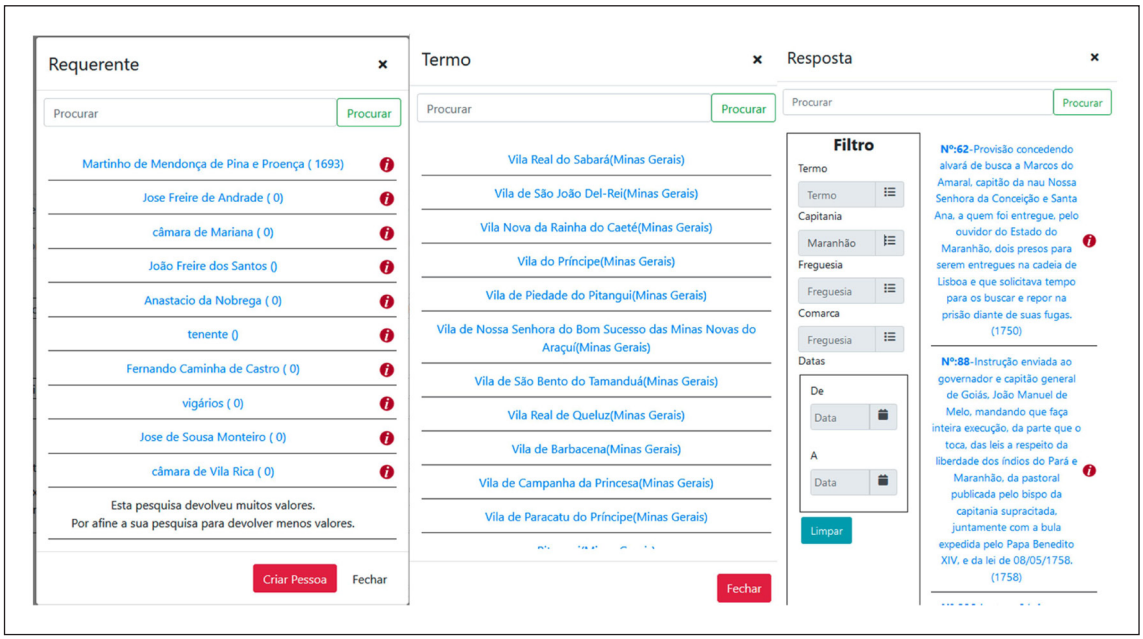

Figure 11: Web application: Some pop-ups that aid the entering of *commencement* data. Screenshot of the application developed by Paulo Bastos.

Furthermore, the web application is available in the link cited (Projeto Circuitos Oceânicos 2024), designed at this moment to restrict access. Only the people of the Project can introduce data according to the type of user, differentiating, for example, users who can include and/or update any data in the database and see some summary reports (called administrator user) from those who can only include and/or update data in some tables. **Figure 12** presents the initial window that is only available to administrators, while **Figure 13** gives an example to control data about people (*pessoa*) appearing in the application. **Figure 14** and **Figure 15** show examples of summary reports.

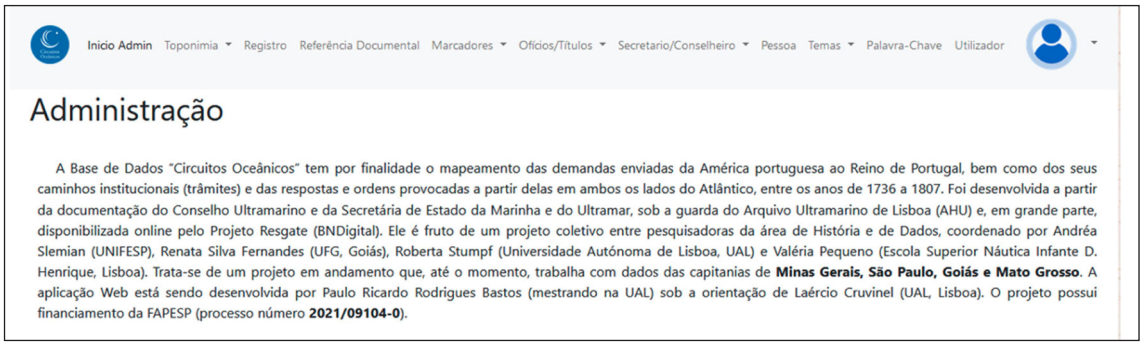

Figure 12: Web application: Administration window. Screenshot of the application developed by Paulo Bastos.

Figure 13: Web application: Administration window to enter people (*pessoa*). Screenshot of the application developed by Paulo Bastos.

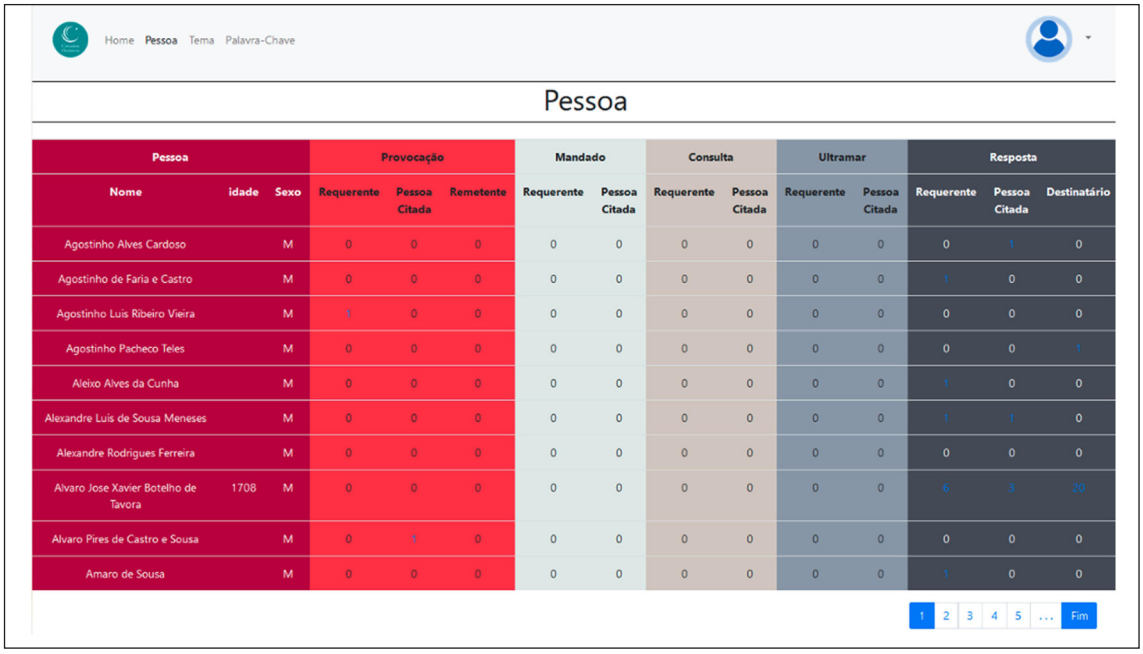

Figure 14: Web application: Report on people appearing in a document. Screenshot of the application developed by Paulo Bastos.

Figure 15: Web application: Dashboards with summarized information about the data entered. Screenshot of the application developed by Paulo Bastos.

Currently, it is only possible to perform traditional relational queries. However, we plan to develop some spatial and relational visualization using other tools, such as spatial analysis and network analysis. PostgreSQL has an extension called PostGIS, which supports geographic objects and thus allows us to perform sophisticated spatial queries. We believe this feature will be very useful in the development of our future analysis tools.

4. Final considerations

As we have shown, the creation of a specific database for the Project allowed the establishment of a wide range of relationships between the tables and fields in the same case in relation to the distinct moments of assessment and decision-making caused (*circuits*), associated with those involved, locations, themes, and institutional procedures, amongst other variables included in the database.

From the data point of view, this signifies the construction of a database attentive to the specific particularities and problematics of the research, capable of taking into account the complexity of associations proposed, providing tools and solutions that facilitate the cross-referencing of data and their verification, and the optimization of the search and information extraction possibilities, as well as feasibility and security in data storage. Additionally, it is important to highlight the development potential of application interfaces. We also intend to develop some spatial and relational visualization using other tools, such as spatial analysis and network analysis, as well as graphic visualization and *dashboards* from the collected data.

In a second stage of the Project, we intend to publish the data in an open format, according to the good practices of the semantic web. This will allow widespread data sharing, allowing consultation by researchers and applications, and even the migration of information, permitting the incorporation of its results in other research projects. To achieve this, we plan to use or create a domain ontology and use approaches, as presented in Vidal and colleagues (Vidal et al. 2022), to build an Enterprise Knowledge Graph from a relational database.

From the point of view of History, the possibilities for the systematization and unveiling of information about imperial political communication will be extraordinary and unprecedented. In addition to being able to delimit in greater detail those who submitted petitions, what they requested, the responses to these, and the time taken, it will also be possible to analyze the patterns of processing of demands, the networks of relationships between people, and individual or collective trajectories in relation to channels of representation of their interests, amongst others. Finally, we will have a prototype of the mapping of imperial political communication that can be applied to other research realities.

Competing interests

The authors have no competing interests to declare.

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Primary Sources

Arquivo Histórico Ultramarino, Livro de Registro de Consultas de Partes, Códice 193 (1751–1753).

Arquivo Histórico Ultramarino, Livro de Registro de ordens de partes, do Conselho Ultramarino, Códice 193 (1746–1750).

Arquivo Histórico Ultramarino, Livro de Registro de provisões, do Conselho Ultramarino, Códice 102 (1750–1755).

Arquivo Histórico Ultramarino, Minas Gerais, cx. 55, doc. 63.

References

Almbjär, Martin. 2019. "The Problem with Early-Modern Petitions: Safety Valve or Powder Keg?" *European Review of History* [*Revue Européenne d´histoire*] 26(6): 1013–1039. Accessed August 3, 2024. https://doi.org/10.1080/13507486.2019.1575798.

Alves, Daniel. 2016. "As Humanidades Digitais como uma comunidade de práticas dentro do formalismo académico: dos exemplos internacionais ao caso português." *Ler História* [Online] 69: 91–103. Accessed August 3, 2024. https://doi.org/10.4000/lerhistoria.2496.

Aragopedia. (2014) 2024. "Aragopedia Ontology." Accessed October 3, 2024. https://opendata.aragon.es/def/Aragopedia.html.

Atlas Digital da América Lusa. 2020. "Institucional." Last modified February 7. Accessed October 3, 2024. http://lhs.unb.br/atlas/Institucional.

Barleta, Leonardo. 2015. "Bases de datos y organización de la información histórica: por un modelo (supuestamente) universal." In *La historiografia ante el giro digital: reflexiones teóricas y prácticas metodológicas*, edited by Juan Andrés Bresciano and Tiago Gil, 111–134. Montevideo: Ediciones Cruz del Sur.

Black, Jeremy. 2015. *The British Empire: A History and a Debate*. Abingdon, UK: Routledge.

Bloch, Agata, Demival Vasques Filho, and Michał Bojanowski. 2022. "Networks from Archives: Reconstructing Networks of Official Correspondence in the Early Modern Portuguese Empire." *Social Networks* 69: 123–135. Accessed August 3, 2024. https://doi.org/10.1016/j.socnet.2020.08.008.

Borges, Graça Almeida. 2017. "The South Atlantic and Transatlantic Slave Trade: Review Essay." *e-JPH* [online] 15(1): 153–175. Accessed August 3, 2024. http://scielo.pt/scielo.php?script=sci_arttext&pid=S1645-64322017000100009&lng=pt&nrm=iso.

Boschi, Caio César. 2018. "Projeto Resgate: História e arquivística (1982–2014)." *Revista Brasileira de História* 38(78): 188–208. Accessed August 3, 2024. http://dx.doi.org/10.1590/1806-93472018v38n78-09.

Bouza, Fernando, Pedro Cardim, and Antonio Feros, eds. 2020. *The Iberian World: 1450–1820*. New York: Routledge.

Boxer, Charles. 1969. *The Portuguese Seaborne Empire: 1415–1825*. London: Hutchinson.

Bresciano, Juan Andrés, and Tiago Gil, eds. 2015. *La historiografia ante el giro digital: reflexiones teóricas y prácticas metodológicas*. Montevideo: Ediciones Cruz del Sur.

Brickley, Dan, and Libby Miller. 2014. "FOAF Vocabulary Specification 0.99." Accessed October 3, 2024. http://xmlns.com/foaf/spec/.

DBpedia. (2008) 2024. "About: http://dbpedia.org/ontology/." Accessed October 3, 2024. https://dbpedia.org/ontology/.

DCMI (Dublin Core Metadata Initiative). 2024. "About DCMI." Accessed October 3. https://www.dublincore.org/about/.

Dedieu, Jean-Pierre. 2018. "Les grandes bases de données. Une nouvelle approche de l'histoire sociale. Le système Fichoz." *História: Revista da Faculdade de Letras da Universidade do Porto* III (5): 99–112. Accessed August 3, 2024. https://shs.hal.science/halshs-00004690/document.

Elliot, John Huxtable. 2006. *Empires of the Atlantic World: Britain and Spain in America 1492–1830*. North Yorkshire: Yale University Press.

Fernandes, Renata Silva. 2022. "O Conselho Ultramarino e as queixas e agravos do ultramar português (Minas Gerais, 1750–1808)." *Revista História* 181: 1–34. Accessed August 3, 2024. https://doi.org/10.11606/issn.2316-9141.rh.2022.1836932021.

Fragoso, João, and Nuno Gonçalo Monteiro, eds. 2017. *Um reino e suas repúblicas no Atlântico: comunicações políticas entre Portugal, Brasil e Angola nos séculos XVII e XVIII*. Rio de Janeiro: Civilização Brasileira.

Gil, Tiago. 2019. "Experiências colaborativas no projeto Atlas Digital da América Lusa." *Educação Em Foco* 24(2): 593–613. Accessed August 3, 2024. https://periodicos.ufjf.br/index.php/edufoco/article/view/27856.

Israel, Jonathan J. 1990. Empires and Entrepots: The Dutch, the Spanish Monarchy and the Jews, 1585–1713. London: Ronceverte (Hambledon Press).

Israeli, Yanay. 2023. "Petition and Response as Social Process: Royal Power, Justice and the People in Late Medieval Castile (c. 1474–1504)." *Past & Present* 262(1): 3–44. Accessed August 4, 2024. https://doi.org/10.1093/pastj/gtad003.

Lopes, André Pereira Leme. 2018. "Virada digital? Pesquisa histórica no ciberespaço." Revista Tempo e Argumento 10(24): 136–169. Accessed August 4, 2024. https://doi.org/10.5965/2175180310242018136.

Masters, Adrian. 2023. *We the King: Creating Royal Legislation in the Sixteenth-Century Spanish New World*. Cambridge: Cambridge University Press.

Martins, Ana Canas Delgado. 2018. "A documentação do Conselho Ultramarino como património arquivístico comum: subsídios à sua história." *Revista Brasileira de História* 38(78): 39–54. Accessed August 4, 2024. https://doi.org/10.1590/1806-93472018v38n78-02.

Pequeno, Valéria, Andréa Slemian, Renata Silva Fernandes, and Roberta Stumpf. 2024. "Dicionário de Dados do Banco de Dados do Projeto Circuitos Oceânicos." Zenodo. Accessed October 3. https://doi.org/10.5281/zenodo.12742722.

Projeto Circuitos Oceânicos. 2024. "Página Principal." Accessed October 3, 2024. https://circuitosoceanicos-bd.unifesp.br.

Projeto Resgate Barão do Rio Branco. 2024. "About the Projeto Resgate Barão do Rio Branco." BN Digital Brasil. Accessed October 3. https://bndigital.bn.gov.br/dossies/projetoresgate/sobre-o-projeto-resgate-barao-do-rio-branco/.

SILB (Sesmarias of the Luso-Brazilian Empire). 2024. "Platforma S.I.L.B." Accessed October 3. http://www.silb.cchla.ufrn.br/banco-de-dados-on-line-a-utilidade-dos-numeros-no-estudo-do-sistema-sesmarial.

SlaveVoyages. 2024. "Explore the Origins and Forced Relocations of Enslaved Africans Across the Atlantic World." Accessed October 3. https://www.slavevoyages.org/.

Slemian, Andréa. 2023. "Entre graça e direitos: apontamentos sobre como entender as petições na América portuguesa (século XVIII)." *Almanack* 34: 000223. Accessed August 4, 2024. https://www.scielo.br/j/alm/a/333vBDgfvzNN3y3dx4Cc8jN/?lang=pt.

Sula, Chris Alen, and Heather V. Hill. 2019. "The Early History of Digital Humanities: An Analysis of Computers and the Humanities (1966–2004) and Literary and Linguistic Computing (1986–2004)." *Digital Scholarship in the Humanities, edited by Edward Vanhoutte* 34(1): 190–206. Oxford: Oxford University Press. Accessed August 4, 2024. https://doi.org/10.1093/llc/fqz072.

Svensson, Patrik, Julie Thompson Klein, Tara McPherson, and Paul Conway. 2016. *Big Digital Humanities: Imagining a Meeting Place for the Humanities and the Digital*. Michigan: University of Michigan Press, Digitalculturebooks. Accessed August 4, 2024. https://doi.org/10.2307/j.ctv65sx0t.

Vidal, Vânia, Valéria Magalhães Pequeno, Narciso Moura Arruda Júnior, and Marco Antonio Casanova. 2022. "Publication and Maintenance of RDB2RDF Views Externally Materialized in Enterprise Knowledge Graphs." *International Journal of Web Information Systems* 18(5/6): 255–285. Accessed August 4, 2024. https://www.emerald.com/insight/content/doi/10.1108/IJWIS-02-2022-0043/full/html.

Wilkinson, Mark D., Michel Dumontier, IJsbrand Jan Aalbersberg, Gabrielle Appleton, Myles Axton, Arie Baak, Niklas Blomberg, et al. 2016. "The FAIR Guiding Principles for Scientific Data Management and Stewardship." *Scientific Data* 3: 160018. Accessed August 4, 2024. https://doi.org/10.1038/sdata.2016.18.

Zaret, Davis. 2019. "Petition-and-Response and Liminal Petitioning in Comparative/Historical Perspective." *Social Science History* 43(3): 431–451. Cambridge, UK: Cambridge University Press. Accessed August 4, 2024. https://doi.org/10.1017/ssh.2019.16.