Art through Wikidata:
A Digital-Curation Perspective

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Introduction

Digital Curation Lab Director Toni Sant and the artist Enrique Tabone started collaborating on a research project exploring the visualization of specific datasets from Wikidata for artistic practice in 2019. Initially, this involved digital-curation work conducted by Tabone on the women artists whose works are in the University of Salford's art collection. Through data analysis, employing Wikidata tools, this project revealed how works by women and nonbinary artists can be given greater public visibility, while also suggesting ways for addressing the gender gap.

Wikidata is an open-structured data repository that enables information to be organized in accessible ways. Employing SPARQL language and data-visualization tools on the wiki platform, this artistic research project has developed a creative workflow model for processing essential information about art collections and specific museum structures.

The first work by Tabone in this direction has now been developed as an inquiring model that can be applied to different art and/or museum collections. Through the Digital Curation Lab, datasets that have received this treatment over the period 2021–2023 include about a hundred university art collections across the United Kingdom, as well as Heritage Malta's collection of prehistoric female figurines, held at two museums in Malta and Gozo.[1] The project has yielded a small number of research outputs. The first of these was presented during DRHA 2021, among other pertinent fora. This involved a presentation on how the initial findings from this project enable art collection managers to get a better picture of the gender gap and to plan data-based ways to present works in the collection.[2]

[1] The open dataset created specifically for this research project is now available in Wikidata, detailing the collection of prehistoric female figurines in the Heritage Malta collection held at the National Museum of Archaeology in Valletta and the Ġgantija Archaeological Park in Gozo.
[2] See Wikimedia Foundation video presentation (14 August 2021), available at https://www.youtube.com/watch?v=pQ4-lc2q8_E. Accessed January 9, 2024.

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A second output resulted from the artist's work using the same method on the Heritage Malta dataset to initiate an artistic exploration involving the visualizing of scientific data, with special attention to the esthetic qualities afforded by this technological engagement. This resulted in the exhibition of an artwork that consisted mainly of a video-art installation, depicting aspects of data art as embodied in this part of the broader research project. This was presented during DRHA 2022 at the Stanley Picker Gallery in Kingston, London, along with a physical object developed from the artistic interpretation of the data visualization contained in the video. The purpose of the physical object was to materialize the data work beyond digital technology, to return it to forms that are more congruent with the historical art objects captured in the dataset.[3]

By the following year, the project brought together the research work conducted over the previous period toward a coherent conclusion. Specific data were captured and analyzed. In turn, these data were processed through visualization and sonification tools toward the goal of exploring how artistic expression can yield original works of art based on essential elements within a dataset. For DRHA 2023, this was demonstrated through a sound-art installation (presented at the conference through an individual pair of headphones) accompanied by physical objects, both created by Tabone, presented at the Rectorate of the University of Turin. This work of art is designed to extend the concept of materiality beyond specific contents of Wikidata, which are taken to be a medium of production rather than dissemination.

A Dataset of Prehistoric Figurines in the Heritage Malta Collection

The work described in this article is based on a Wikidata dataset about artifacts within the two collections of female prehistoric figurines and fragments held at the National Museum of Archaeology in Valletta and the Ġgantija Archaeological Park in Gozo. Significant numbers of prehistoric figurines, depicting mainly humans and animals, were discovered and collected in the central Mediterranean island nation of Malta as early as the late nineteenth century and throughout the twentieth century (Pace 1996). This followed the earlier identification of specific sites across the Maltese

[3] This work is described and discussed in the 2023 article, Toni Sant and Enrique Tabone, "*Naked Data*: curating Wikidata as an artistic medium to interpret prehistoric figurines," *International Journal of Performance Arts and Digital Media*, DOI: 10.1080/14794713.2023.2253335.

islands as prehistoric remains. The figurines were found in megalithic complexes and burial sites.

The precise dating of figurines remains difficult, but many aspects of the iconography persist over the entire span of the period. Representations are made from clay, stone, and bone, ranging from naturalism to complete abstraction, and vary from 1.2 centimeter to just over 3 meters in height (Vella Gregory 2005, 336). The representations display a range of gestures and positions. They can be seated, standing, or lying down. Arms and legs (where present) are placed in various positions. These objects are now held by Heritage Malta, which is the national agency responsible for safeguarding most of the country's tangible heritage and presenting it to the public.

The main themes arising from prehistoric female figurines that are relevant to the present practice-based art research project center on the artistic possibilities afforded by the historical interpretations of these objects. These interpretations are also embedded in the way these archeological objects have been categorized, or not, by Heritage Malta. In the process, a significant shift in attention is emphasized, from "prehistoric deities" to representations of the female body.

Experiential learning can be an integral part of a practice-as-research (PaR) method. For example, Hohl (2011) proposes experiential learning through physiological experience as a method for comprehending scientific data through artistic approaches.

The tactile aspects of hand-making an esthetic object brought the artist closer to the creative impulse embedded within the prehistoric objects displayed in the museum. Through this connection, she came to see that the final manifestation inevitably relates back directly to the collection and the dataset that represents it, even if this is not immediately evident to the audiences who see the new work of art.

Although not intended as research outputs in the present study, Tabone chose to model some of the Heritage Malta collection objects in clay. This was not an attempt to create replicas of the objects in the museum but rather to acquire experiential knowledge of the body forms through the physical materiality of clay. From this, she created a 15 cm by 7 cm by 4.5 cm clay figurine, modeled on her own body. Through this work, she understood that the proportions and dimensions of female figurines appear less exaggerated when viewed from the vantage point of someone looking down at her own body. Seen from above, this figure has regular proportions, especially for breasts and hips. This clay figurine along with two 3D-printed versions from scans of the object were exhibited as part of the

sound-art installation during DRHA 2023 under the title *Prestorjha – data sonification*.

This work should be considered within the context of the broader body of work that the artist created between 2019 and 2023 around the theme of reimagining prehistoric female figurines from a feminist perspective. As part of this exploration, using clay as a medium for experiential learning, Tabone crafted various figure studies inspired by the ancient figurines housed within the Heritage Malta collection. The one that was exhibited in Torino underwent 3D scanning by the Gozo-based imaging company Solid Eye, resulting in the formation of a large inflatable PVC figure named Ninfa.

The juxtaposition of historical representations of women with modern perspectives underscores the complexities of understanding and interpreting such depictions across different cultural and historical contexts. Feminist scholars advocate an approach that emphasizes cultural sensitivity and an awareness of the biases and assumptions that may influence our interpretations of prehistoric female imagery. In her work with prehistoric figurines, Tabone proposes a significant shift in perspective by adopting the possibility that the creators of these objects to be women rather than men – a notion initially championed by Catherine McCoid and LeRoy McDermott in their 1996 American Anthropologist article "Toward Decolonizing Gender." It is also noteworthy that certain neolithic temples in the Maltese islands bear resemblance to human female figures when viewed from above (Lomsdalen 2015). Through careful examination of relevant artifacts held by Heritage Malta, Tabone has embraced the concept, as articulated by McCoid and McDermott, among others, that neolithic women possessed a comprehensive understanding of their body types and life cycles.

Explorations in Data Representation through Visualization and Sonification

Data representations – regardless of whether it is data visualization or data sonification – enable us to look *into* a collection rather than *at* a collection. This is a data-science point of view, where the aim is to discover relationships among items within the dataset while stitching them together through shared properties. Data humanist Giorgia Lupi (2017) claims that design serves the data, in the sense that it is the design that you see first in any data visualization. This level of interpretation leads from data visualization into data art.

Structured data, available through platforms such as Wikidata, are useful

in various ways. Structured data drive a multilingual online encyclopedia (Wikipedia) and provide a vast body of knowledge for AI systems like Siri, Alexa, and ChatGPT to pull up requested information. However, it is not always easy to extract useful knowledge from the data beyond the obvious. One way to address this problem is through data-visualization tools.

About fifty visualization tools have been developed for Wikidata.[4] These data-visualization tools are used mainly to generate charts (such as radar charts, bubble charts, and timelines), trees (such as clusters or radial trees), and maps. Most of them were built for specific projects, such as openArtBrowser, designed to show artworks by the same artist, movement, or motif,[5] or the Histropedia timeline generator, which uses data from Wikipedia and Wikidata to generate timelines from various historical perspectives.[6]

According to information designer David McCandless, "one of the potentials of [data] visualization is to bring the data down to earth" (cited in Edge 2015). Visualizing data can help to provide a better understanding of the dataset. One example is the ability to see and show ways data items connect to each other via specific properties or how missing data on that same property within a dataset can show a gap in knowledge about the subject being visualized. This promotes insight into the possibility of discovering new information by connecting data. In other words, what the data are unable to communicate directly is also important and useful when attempting to understand datasets more holistically.

Data-visualization work extended into data art needs little additional narration or curatorial guidance for its intended audience. This is because data art by nature tends to tell its own story or stories, which are often open to interpretation by its audiences, possibly even through their own personal biases. Moreover, the data employed in data art are curated – even if only in the digital-curation sense of working with and on the metadata. Most data art is not concerned with haphazard data but rather with data that are curated to some degree or other. Even if elements of the data are randomly generated (which is not the case here), these are deliberately included in the data-art experience intended by the artist through a more conventional curatorial process of inclusion and elimination.

Artistic expression through a practice-as-research method can provide new insights for curators in terms of what they can do with their collec-

[4] For a current list of visualization tools on Wikidata, see https://www.wikidata.org/wiki/Wikidata:Tools/Vizualize_data. Accessed January 9, 2024.
[5] See https://openartbrowser.org. Accessed January 9, 2024.
[6] See http://histropedia.com/timeline/. Accessed January 9, 2024.

tions and the way they are displayed to their audiences. Rather than focusing only on screen displays within the museum, curators can create new experiences that can also be experienced off-site, providing opportunities for vertical, horizontal, or tangential explorations that are otherwise not possible within the static museum-display experience. A specific example, as it relates to the present research project, involves a way to potentially link up the objects displayed at the two museums more directly in ways that most visitors currently overlook, unless they happen to have visited both museums (which are on different islands) consecutively..

Creating Data Art with Sound: Exploring Data Sonification

Through the curation of the dataset to create the *Naked Data* installation presented in London during DRHA 2022, Tabone became familiar with Heritage Malta's collection of prehistoric female figurines and fragments, in particular, by capturing and developing the data now held within the Wikidata repository. Before Tabone's intervention, Heritage Malta's data were only available in a paper ledger, accessible to researchers only by request. She soon came to perceive further potential for this dataset to be explored from an artistic perspective, which could also provide further access through experiential options. It was at this point that the artist chose to consider data sonification.

The metadata pertaining to descriptions of the object are particularly useful for creative exploration. This translates to the "depicts" property (P180) on Wikidata, which helps capture the formal qualities of some of these objects in ways that can sometimes be somewhat subjective. The approach selected for the present study seeks to retain respectful capturing of the metadata provided by archeologists endorsed by Heritage Malta when classifying figures as women or fragments as parts of a woman's body. The data gathered for each item in the collection had to be both quantitative (such as sizes and dates) and qualitative (such as given names, descriptions, and interpretations).

Immediately, it became evident that with regard to data visualization and/or sonification techniques, not all data properties and values within this collection were going to be equally suitable for that purpose. This is particularly so for qualitive data. This is also why it is crucial to ensure that the data are captured and formatted consistently so that properties and values are congruent across a target dataset. This is perceived as curatorial practice, both as data curation and curation through data.

Data curation relates directly to the management of the data itself, while

curation through data involves decisions on the dataset and adjustments to individual data entries towards a specific curatorial goal. In collecting factual data, historic data needs to be kept accurately too as this enables the historiographic analysis of the way such objects are described and classified. Similarly, the values associated with "depicts" (P180) are the ones that are predominantly open to an artistic interpretation from a visual perspective.

A Wikidata query of all the prehistoric female figurines and fragments in the Heritage Malta collection held at both the National Museum of Archaeology in Valletta and Ġgantija Archaeological Park in Gozo enables easy creation of an exportable CSV file, which is all that is needed to import into the selected sound-editing software package to get going. In the process of importing the dataset into sound-editing software package it is crucial to identify the data source that is to be sonified. The property "depicts" (P180) is appropriate for such an exercise. Selecting it as the main data source enabled the initial creation of the data sonification from this dataset.

Like data visualization, data sonification is a process of data representation through esthetic means. In this case, sound can be created from a dataset, attributing specific aspects of sound composition to particular properties and values associated with items within a selected dataset. Selecting the property "depicts" (P180) as the main data source enabled the initial creation of the data sonification from this dataset, attributed to the various body parts and poses. The resulting data-sonification file provided a sonic representation of the selected data from the Wikidata dataset. Each of the 227 sound triggers represents a data value within the selected property.

Although many types of sound-editing software packages provide options for several combinations of sounds and filters of the data, Tabone decided to keep her esthetic choices relatively simple. This exercise provided enough raw sound objects to proceed to manipulate them into a musical composition, the equivalent of the visual-art outputs in the 2022 *Naked Data* art installation. The artist was guided by David R. Worrall's explanation that, "It is useful to distinguish data sonifications made for the purpose of facilitating the communication or interpretation of relational information in data, and data-driven music composition, ambient soundscapes and the like–the primary purpose of which is personal expression and other broader cultural considerations, whatever they may be" (Worrall 2018, 180). Some resulting sonifications may be more complex, or even more or less musical, than others, depending on the artist's choice of format manifestation.

The artist is aware that acquiring skills in music composition and/or sound production can enable a conventional visual artist to create new works that are potentially more meaningful or impactful from a technical perspective. The sound art piece developed through the data-sonification exploration within the framework of this project has already been integrated in a solo art exhibition by Tabone, curated by Sant, presented at Spazju Kreattiv in Malta, in March and April 2023.[7] Within the context of that exhibition, the sound-art work presented at DRHA 2023 enabled the artist to present her insights into Heritage Malta's collection of prehistoric female figurines in an art setting outside the structure of the formal research work conducted within the Digital Curation Lab. Combining the sound work with the 3D-printed art objects ties in this work with the work of art exhibited at DRHA 2022. It should, however, be emphasized that the connection is through dataset queries rather than reproduction of the formal aspects of figurines or fragments displayed in the museum.

An appropriate visual allusion to the prehistoric figurines is made by the artist in choosing to explore different iterations of the figurine she created through her exploration of physical materiality of clay. From the 15 by 7 by 4.5 clay figurine that she modeled on her own body, she not only gained new insights into the proportions and dimensions of female figurines through an alterate vantage point but also was able to explore other, more contemporary materials and techniques to create figurines based on the same shape. The clay object was 3D-scanned and subsequently 3D-printed in clear resin and black acrylonitrile butadiene styrene (ABS). Resin becomes a glass-like substance when it dries and hardens. ABS is a thermoplastic commonly used for 3D printing (see Figure 1).

The fact that the artist has chosen to work with this scan of the small clay figurine she modeled on her own body to create another work of art – for her 2023 solo exhibition in Malta – should not be overlooked in this context. The three-meter-tall inflatable PVC sculpture exhibited as Ninfa plays with the fine-art element of the conceptual aspects at the heart of the data sonification and the small physical art objects presented in Turin. In the Malta exhibition, the sound art was accompanied by the large sculpture rather than the small figurines. While the estethic impact of the two works is noticeably different, the work still seeks to convey to its

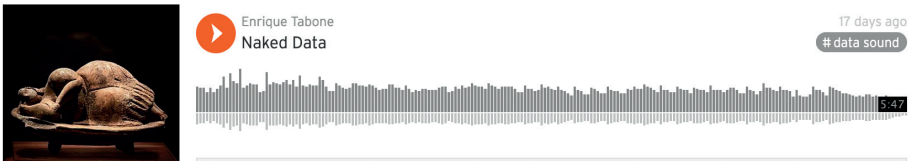
[7] A catalogue of this exhibition, including curatorial notes, can be found in Toni Sant, *Enrique Tabone: Catalogue Raisonné*, Malta: Kite Group, 104–175 and 194–207 (2023).

Figure 1

audience that the sound is directly related to the female form depicted in the respective sculptures (Sant 2023, 152-155).

The sound produced by the data imported from Wikidata was exported as an audio file enabling it to be manipulated in a digital-audio workstation that has multiple tracks, layering sounds into a final unique production. Although this sound file was not designed to accompany the *Naked Data* art installation she produced the previous year, the name Naked Data was retained for this sound-art work, because the same creative principles were now being applied to a sound composition stemming from data sonification with data from the same dataset used earlier.

Figure 2



A rhythmic layer provides a heartbeat-like quality throughout the track, indicating that these data may relate to human figures. The variations in the rhythmic track come from the different depictions from the data about each figurine. The first part of the sound work is manipulated to create the aural palette that the artist chose for this work. However, the rest of the composition is generated by the dataset itself without further artistic manipulation. You are literally listening to the dataset for Heritage Malta's collection of prehistoric female figurines and fragments.[8]

Conclusion

Why use data art to interpret a dataset that can be experienced through conventional data-visualization methods? This question enables an evaluation of this practice-based research project. It does so not by looking at an isolated art installation but by proposing a model for the application of datasets in the making of new art objects. The project engages with a specific dataset through a creative process to enable the learning of new things about a collection of museum objects that would probably not have been possible by simply observing, replicating, or interpreting them in isolation.

One of the main objectives established for this collaboration was to provoke new research opportunities not only on this dataset but also on other datasets through the method developed since 2019. Ultimately, the way of working with Wikidata proposed here is to connect collections together through links. These are either not obvious or are ones not necessarily easy to process without the magnitude of data aggregation provided through this open knowledge database, which is both human-readable and machine-readable. In the context presented here, this entailed transforming data into open knowledge and making it inclusive, while producing art that provides wider creative experiences.

The method of artistic expression has been deliberately chosen for this project as fuel for flights of fantasy beyond ordinary imagination. The idea for this project arose from an exercise to create data from art, which in turn triggered a curiosity toward the exploration of the possibility for the data from art enabling the creation of a new work of art. A data point of view (Duarte 2019) is expressed in an art installation intended as an opportunity for feminist data perspectives (D'Ignazio and Klein 2020) to

[8] The *Naked Data* sound file is available at https://on.soundcloud.com/Ex6J7 (see Figure 2).

be explored in ways that have not happened before. The main idea is to turn data visualizations or sonifications from a dataset into an art object, driven by the aim to create an experience for the exploration of the collection from a data perspective. This can potentially also make possible the discovery of connections that are otherwise not evident without curatorial intervention.

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