# **DHQ: Digital Humanities Quarterly**

2017 Volume 11 Number 3

### All and Each: A Socio-Technical Review of the Europeana Project

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#### Abstract

Digital technologies offer opportunities for engagement with cultural heritage resources through the development of online platforms and databases. However, questions have been raised about whether this type of engagement is structurally open or bounded by pre-existing institutional frameworks. Michel Foucault's later work on "governmentality" speaks to this concern and identifies in modes of government the mutually reinforcing relation of all and each, "to develop those elements constitutive of individuals' lives in such a way that their development also fosters that of the strength of the state" [Foucault [1979] 2000a]. This article takes Foucault's insight as a point of departure for thinking about how digital technologies are mediating and structuring the relationships between individuals and organizations, using the European Commission-funded Europeana project as a case study. Europeana is the embodiment of all and each as a technique of government: it functions by fostering the contributions of individuals and national audiences in a way that celebrates their diversity, while also engaging in a project to systematically standardize and unify. Examination of the technical elements of Europeana reveals the political imperatives implicit in its technical operations, and how the parameters for audience participation are subsequently defined. In this article, we examine the audiences explicitly and implicitly delimited by Europeana, and then analyze them in relation to the project's development of the European Data Model (EDM) for the interchange of metadata about cultural heritage objects. The article concludes that a lack of explicit definitions about audiences, what Europeana is, and how its various parts work in concert constitute a definitional void. This void is a technique of government in that it absorbs difference and is deliberately vague. It involves power relations that are hard to center and render visible, and it is thus difficult to detect which actors are occupying a space of privilege. We suggest some tentative strategies for addressing this problem by attending to the sites of awkward engagement and difference that are currently masked in the technical framing of Europeana.

#### Introduction

The logic of participation and shared ownership, frequently glossed as the democratization of knowledge, belies much of the public discourse around digital heritage web technologies (see, e.g., [Terras 2011]). However, the institutional imperatives that drive the development of such technologies have sometimes given cause for unease about the maintenance of autonomy for those using them [Andrejevic 2007]. Most often, debates focus on how far the enabling aspects of online participation at the same time pose a threat to control over personal content; how the ephemeral nature of digital content serves to further entrench the existing politics of dominant memory narratives; or how the tensions play out between digital heritage in official memory institutions and community-oriented or personal projects.

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Michel Foucault's later work on "governmentality" speaks to these concerns and also challenges the personal-institutional dichotomy they presuppose. He identifies in modes of government the mutually reinforcing relation of all and each, which seeks "to develop those elements constitutive of individuals' lives in such a way that their development also fosters that of the strength of the state" [Foucault [1979] 2000a]. Here, we investigate the move of all and each as it relates to the longstanding goal of European integration, and efforts to confirm Europe as a unified entity through the notion of a shared cultural heritage. The Europeana project is the case study through which these issues will be examined further.

Europeana is a database and website that offers access to digitized items from over 2500 of Europe's museums, libraries and archives. Funded by the European Commission (EC), the European Union's (EU) executive body, Europeana demonstrates the move of all and each very clearly in its aim to promote a distinctly European space online for heterogeneous cultural objects and experiences. It is precisely the involvement of individual users and organizations that furthers this aim; the former group search for and submit content to it, while the latter are the primary donors of cultural heritage metadata. The parameters for user participation are subsequently defined according to these operations, which potentially limits the nature of audiences' relationships with it.

Our interest here is in the way audience-organization relations are represented and delimited by technology. In this case study, we examine how such relations present themselves within the socio-technical network of Europeana, and how audience conceptions operate as techniques of government on the part of the EC. We discuss the interplay between the EC's cultural policies and the techniques

enacted through Europeana and show how the dynamic of all and each is manifested at different levels of the project. Digital platforms like Europeana, because of their scale, their partial (at best) success/adoption, and their nebulous geographic location are an interesting site for further exploration of these issues.

Our argument proceeds via an investigation of several technical elements of the project, particularly the European Data Model (EDM) for aggregation and the application program interface (API). A conglomerate of existing metadata standards, the EDM was designed to facilitate the aggregation of digital cultural heritage objects (CHOs) for the construction of the public memory portal found at europeana.eu. The technical premise of Europeana, and its data model, entail interoperability, which have political implications when considered in light of the EC's drive for greater social and political cohesion in Europe. However, the political dimensions of interoperability are seldom, if ever, owned by developers. The article concludes that a lack of explicit definitions about audiences, what Europeana is, and how its various parts work in concert constitute a *definitional void*. This void is a technique of government in that it absorbs difference and is deliberately vague. It involves power relations that are hard to center and render visible and it is thus difficult to detect which actors are occupying a space of privilege. We suggest some tentative strategies for addressing this problem by attending to the sites of awkward engagement and difference that are currently masked in the technical framing of Europeana.

## All and Each

In the 1979 lecture, "Omnes et Singulatim: Towards a Criticism of 'Political Reason'," Foucault proposed that Western modes of government rely on the limited freedom of individuals for their continued functioning, an idea that both parallels and challenges debates about cultural production and the public consumption of digital heritage. Instead of stating the relationship between organizations and audiences in oppositional terms, Foucault identifies the mutually reinforcing relation of *all and each*. He writes, "right from the start, the state is both individualizing and totalitarian [...] Its inevitable effects are both individualization and totalization. Liberation can only come from attacking, not just one of these two effects, but political rationality's very roots" [Foucault [1979] 2000a, 325]. While the reference to the state is somewhat misleading, since, for Foucault, the state has no essence and is a function of changes in the practice of government, the suggestion that these totalizing and individualizing effects work to bolster one another is an important insight. In a passage from "Governmentality", Foucault clarifies his theory further:

What government has to do with is not territory but, rather, a sort of complex composed of men and things. The things, in this sense, with which government is to be concerned are in fact men, but men in their relations, their links, their imbrication with those things. [Foucault 2000b, 208–209]

These relational networks are composed of humans and things, both technological and analog. In fact, in speaking about entities like the EU, the EC or Europeana, we are employing simplistic terms to denote incredibly complex networks of persons and technologies, as well as technological representations of analog things [Law 1992]. Technologies in the broad sense are understood by Foucault as techniques of government such as programs, apparatuses and calculations. There is a growing recognition that processes and power structures are inflected in the way new technologies are being developed, practices that are often specialized and opaque [Lash 2007]; [Beer and Burrows 2013]; [Drucker 2013]. Such in-scriptions [Akrich 1992] may or may not play out as designers intend when technologies are implemented, and mismatches between design and actual use explain, in part, why some are successful and why others fail. Understanding potential ethical and political issues requires greater knowledge of the way technologies are created, how they work, and how they are ultimately deployed. This approach, a socio-technical analysis based on theories of governmentality, informs our discussion of digital technologies in the cultural heritage context.

Furthermore, we suggest that the dynamic of all and each is particularly relevant to this context and offers a method of investigating, more closely, the negotiation of audience relationships and the individual-institution dichotomy. As Chiara de Cesari notes, heritage scholars have been too focused on the centralization, homogenization and cultural imperialism of heritage regimes and insufficiently attentive to the capacities of decentralized groups, e.g. local communities, or historically marginalized peoples [De Cesari 2012]. The all and each relation highlights the interplay of power relations at different scales [Harvey 2015] and is linked to another important aspect of government: that it is not always successful in its regulative aims. Its strategies are therefore diverse and undergoing constant revision. Rosemary Coombe and Lindsay M. Weiss explain:

Government, in short, "is a congenitally failing operation;" unanticipated outcomes emerge from the intersection of diverse technologies, the conjunction of new techniques and old conditions enable things to work in new and different ways. [Coombe and Weiss 2015, 51]

The technologies that have been developed within and through the Europeana project provide an opening for exploring how such failures are manifested in practice, how they are adapted and re-aligned with the aims of government and how these renegotiations require the enrollment of a variety of audiences.

# Europeana and the Drive for Cultural Unity [in Diversity]

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The story of the development of Europeana is bound up with the EC's ongoing commitment to fostering European unity, emphasizing transnational, rather than national, institutions and affiliations [Europeana 2011]. The original impetus for the initiative came from a perceived threat to Europe's economic interests after the announcement of the Google Books Project in 2005. Amid worries that companies like Google would transfer a considerable volume of cultural heritage content into the private sector, the proposal was made for an equivalent European program, premised on open access and non-exclusive rights [Purday 2009, 171].

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In 2008, the prototype Europeana database was launched, the appellation making its transnational affiliations clear. This was in line with EU strategies, since the 1980s, to promote the formation of a cohesive European identity through its cultural programs [Shore 2001]. Formation is an important notion here, because the aim of these strategies is to create something new, built on existing histories and cultural heritage. As Cris Shore observes, "in many respects, what the [EC] is doing is not dissimilar to that which nationalist elites achieved during the formation of European nation-states in the nineteenth century: i.e. mobilising symbols and inventing traditions in order to give flesh and credibility to a new political order" [Shore 2001] (see also [Hobsbawm and Ranger 2012]). Yet difficulties stem from attributing "European" meanings to manuscripts and artworks that are associated with specific national-historical narratives. Likewise, the very different circumstances from which the nation states of Europe have developed present a challenge to the idea of a coherent European integration and endorsing the idea of "unity in diversity" [McDonald 1996]; [Shore 2006]. Such language connotes the move of all and each in that diverse local projects become mutually constitutive of larger governmental discourses. Foucault describes how the logic of modern political rationality can be understood as a permanent integration of individuals in a totality and, vice versa, a mode of governing that regulates individual conducts or, rather, requires individuals to self-regulate conduct. This is liberalism, namely a constant correlation between an increasing individualization and the reinforcement of a totality [Foucault [1979] 2000a]; [Foucault 2000b].

The motif of unity in diversity also echoes existing debates in heritage studies about the move from monocultural to multicultural forms [Kirshenblatt-Gimblett 2007]; [Harrison 2013]. Narratives and representations of local and national heritage, and the roles they play in the constitution of larger, pan-national projects, are important as they manifest themselves in these relational structures. One view is that the assimilation of peoples and nations into larger social and political entities is accompanied by the increased diversity of local traditions and practices [Jamieson 2002]. On this interpretation, cultural difference is potentially reconcilable with the emergence of broader transnational entities. The vision expressed by initiatives like Europeana, that cultural diversity can be a part of European identity, suggests a similar model but it is difficult to discern how it works in practice, especially when such narratives are imported into the technical space [Presner 2016].

In the face of vast collections like those of Europeana, a selective approach to representation is required to make the content serviceable. The concern is that, if the task of representing European culture in all its forms proves insurmountable, then unity becomes a legitimating gloss for a discourse of European culture that is limited to a narrow construction of cultural heritage. In this context, the need to both define and safeguard European interests reflects the difference by which Europe has historically distinguished itself from other territories [Hall 2003].

However, the political uncertainty surrounding Europe has resulted in a need for the EC to circumvent disputes that arise from talking about a unified European entity directly. Anthropological research into the EC indicates that this is manifested at an organizational level as well. Abélès suggests that the underlying paradigm of the European political process is less one of unification than of harmonization and rationalization. That is, European political practice aims to influence national politics without spelling out its political goals; he writes: "everything is working as if Europe was destined to remain a virtual object" [Abélès 2004, 6]. The concept of virtual Europe clarifies the way in which unity in diversity reproduces forms of identification and difference and reflects the indefinite geographical and governmental status of Europe.

As we will go on to argue, these relations continue to be replicated at various scales through the creation and implementation of cultural heritage technologies, including Europeana. There are also clear ways in which the policy trajectory of Europeana has changed during its lifespan, which is consistent with flexibility as a practice of government. Here, we conduct an analysis of Europeana's conception of its audience over time as the project priorities shift; in this way, it is possible to understand Europeana's changing self-conception and its relationship with European state and identity politics. We take as material for analysis a series of papers produced by or at the behest of people involved in various aspects of Europeana, with a particular focus on the API and the data model. These materials represent different points in Europeana's development, including:

- 2008 The launch and trial of Europeana as an aggregator for metadata.
- 2010-12 The development of both the API and the EDM.
- 2013-15 Re-launch of the website in response to claims of underuse and the introduction of the Europeana 1914-1918 project.

Notions of audience, both implicit and explicit, at each of these stages reflect the adaptations Europeana makes in order to position itself as a successful digital cultural heritage platform, although we acknowledge the difficulty entailed in defining success in this context. With each new phase of development, Europeana speaks to different audiences, including cultural heritage institutions in member states and elsewhere; internal and external technology developers; individual content donors; and the projected users who will search the platform to access digital representations of cultural heritage objects (CHOs). This latter group is represented by individual users within Europe, yet given its partnerships with non-European heritage institutions, there is also the aspiration to reach a more global audience. Decisions taken about technology primarily reflect the positioning of Europeana in relation to its users. These different users and Europeana itself are both implicated in the European identity the EC promotes. It is not insignificant that the structuring of the EDM also, superficially, reflects this idea of unity, which we will discuss below.

Despite pushing for a kind of unity, Europeana is underpinned by disparate metadata and collections information. This implies a political manoeuvre: Europeana is, on one level, an absolute expression of unity in diversity (it works as an aggregator of disparate data) but only in cases where those terms are representative of standards and data models. The vexed political question of how unity in diversity actually works is left to one side. As discussed by Abélès, unity in diversity is a process of harmonization and rationalization, and one that operates via a definitional void: when Europeana fails to define its terms, assumptions and dominant power relations risk becoming further entrenched.

### **Europeana and its Audiences**

How does Europeana work and what is its emphasis? This question is not trivial, and it is telling that at a 2016 heritage studies conference, the authors encountered far more people who had never heard of Europeana than people who could describe the project and its aims. Answering the question requires an understanding of what the name 'Europeana' encompasses. For example, Antoine Isaac et al speak about the multiple priorities and user groups of Europeana, which belies the fact that it is not a single entity, nor does it have a single, sweepingly agreed-upon identity for its users and creators [Isaac, Clayphan, and Haslhofer 2012, 38]. Europeana is a complicated socio-technical network comprising many components that change over time. Here, we recognize a few of them, including the public-facing web portal; the API and the developers behind this; and macro-level policy makers who act as intermediaries between the various manifestations of the Europeana project and the EC.

The public-facing part of the project is represented by a web platform which offers access to digitized items from national museum, library and archive collections across Europe.



Its earliest iteration was modeled on the idea of a digital library. However, it is also a database that enables participating cultural heritage organizations to engage with a large volume of digital content, primarily metadata about digital surrogates for CHOs. Those involved in its development have shown an awareness of this public platform/back-end database duality:

To the general public, Europeana is primarily perceived as a portal exposing a great amount of cultural heritage information. Even though this perception is not entirely misleading, the main goal of Europeana is rather to build an open services platform enabling users and cultural institutions to access and manage a large collection of surrogate objects representing digital and digitized content via an application program interface (API). [Concordia, Gradmann, and Siebinga 2010, 61]

A more pointed quote that concludes the same paper demonstrates a measure of tension in how the greater Europeana project is

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Finally, Europeana is much more than a portal: even though offering portal functionality its main technical incarnation is the Application Programming Interface (API) on which the portal services will be built. [Concordia, Gradmann, and Siebinga 2010, 66]

As indicated, Europeana has conceived of itself and its relationship with users in different ways over its lifespan, and this is indicative of a number of tensions that have persisted within it. What Europeana is or does is informed by some early key policy decisions, chief among these the decision not to store any digital objects itself. Rather, Europeana holds metadata about digital objects from national collections. In other words, by using Europeana's search portal, users are looking at aggregated metadata about digital surrogates for heritage objects: for example, an image file representing a painting and data about the museum to which it belongs, its size, and what the paint and backing media are etc. Europeana does not save or hold these art objects or their digital images: it simply collects data about them. When users click through the content represented at europeana.eu, they are directed away from Europeana proper to the website of the particular institution that holds the analog object and that contributed the digital surrogate and its data to the Europeana database. Example: if you want to know more about the *Mona Lisa*, Europeana will direct you to the Louvre's website.

Concerns about ownership, and especially about the ability to point to web traffic as a metric for successful community engagement, pervade discussions about how Europeana should interact with one of its key audiences: cultural heritage institutions donating their data about their collections:

Europeana's approach to aggregation is very reasonable: aggregate the metadata, but access the digital objects from the providers' sites. This allows the provider to brand the content with their own identity and to offer up navigation and context pertinent to the content. It also precludes the need for Europeana to have to centrally store all of the digital objects and the responsibility for preservation remains with the owning institution. [Erway 2009, 108]

The technological discussions raise this same concern: Cesare Concordia et al. call for both a "unified mentality shift" when dealing with large scale aggregations while also noting that ownership must be clearly visible to two additional key audiences: imagined users who will visit the portal and search for content and those who will build applications and other projects on top of the data and data model [Concordia, Gradmann, and Siebinga 2010, 67].

If the foregoing section identifies three audiences – the individual searching via the portal, the cultural heritage institutions that submit CHOs, and developers using the API – there are a further two audiences implied in the case set of texts about Europeana, though they are not necessarily explicitly defined as such therein. Karen M. Wickett et al point to the audiences implied in the functional roles of collections and collection description: "individual users accessing or contributing content, system developers seeking to improve search experiences, and institutions providing data to federated aggregations" [Wickett, Isaac, Doerr, Fenlon, Meghini, and Palmer 2014]. This suggests the fourth audience, which emerges through more recent projects like Europeana 1914-1918, for the World War I centenary. By relying on individuals to submit content directly, based on personal or family experiences of the War, the fourth audience is distinct from the other donor audience of (often publicly or state-sponsored) cultural heritage institutions. We also argue that there is a fifth audience construction here, and that this is precisely a mirror of self, the "I" in I-methodology [Akrich 1995]. This last audience manifests itself in Europeana in a few ways. Firstly, there is an actual user base which is constructed via the peers and colleagues of those involved in the Europeana technical programs, and secondly, there are the technologies developed for Europeana, which act as a mirror of self, both in the sense of mirroring the ideological and epistemological standpoint of the developers but also in the sense that technological tools mirror the nebulous identity construction of the larger Europeana project.

Developments that stem from Europeana, like the creation of the data model (EDM) and an interface designed to encourage developers to use Europeana (the API) are inflected with the identities designers have in mind and who they think they are talking to. For example, Concordia et al write about the Europeana API to differentiate it from other portals and other digital libraries [Concordia, Gradmann, and Siebinga 2010, 65]. In fact, the authors imply that the technical designers do not talk to Europeana portal users, and distance themselves from the notion that Europeana is a portal at all. Rather, they describe the portal as simply one small use of the API, and this branch of research and development is seen as distinct from work on the EDM. While they are both technological projects under the general Europeana umbrella, exchanges on Google user group pages for Europeana's API highlight the gulf between those who see themselves as working on the API versus those who work on the data model. In one instance, when someone on a forum asked a question regarding a functional ontology for their home institution, in this case a museum, they were quickly referred away to the EDM people by the API Google group. Yet the Concordia et al paper, which argues for an understanding of Europeana as an API, counters this notion by appealing to different audiences [Concordia, Gradmann, and Siebinga 2010, 65]. That is to say, it is an API for those developers in the know: those already working at Europeana and those developers Europeana hope will take up the API.

A competing discourse arises when the primary user audience is invoked, the non-specialist who uses the europeana.eu search bar to look for art works. These portal users are coded by the technical authors as detached from the complexity of the underlying technologies, such as the call method architecture, data system levels, and functionalities. At the same time, Concordia et al use language about

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"hiding" things in the API and a techno-centric discourse is employed to purposefully mask the complexity of these functionalities behind graphical user interfaces (GUIs): in this case, the simple search box on the website landing page [Concordia, Gradmann, and Siebinga 2010, 65].

These issues draw attention to Europeana's lack of definition around audiences. Because it does not concretely define audience when speaking to its "audience" writ large, it implicates a variety of actors with different interests and levels of power in relation to the project. Defining the various audiences of Europeana would require the explicit designation of techno-audiences, including second-party developers at partner institutions and "external" third-party developers like the humanistic researcher investigating watermarks on historical documents. Instead, Europeana literature switches back and forth between discussions of the first four distinct audiences as though they fit within the same group; moreover, it never addresses the fifth "I" audience explicitly.

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What is the potential impact of eliding distinct audiences in this way? When audiences are assumed rather than defined, they default to norms that reinforce existing power relationships. Developers design for themselves, representing assumed users on both the technological side, where API users may in fact share many traits with Europeana developers, and on the public access side, where portal users – often school children doing class projects – probably do not. As such, the portal model suffers from not being what casual access users need in technical terms: "online access to collections is not serving a clear user need" [Erway 2009, 104]. Europeana promotes itself as a rich resource with enough depth to support serious research, yet this kind of take-up by scholars has not been seen, on the portal side or on the API side. In all these discussions, another key audience is never mentioned because it is obscured in the definitional vacuum of Europeana itself: what do heritage institutions get out of their participation in Europeana? This is part and parcel of the tension around concepts of ownership, mentioned earlier, and speaks to the all and each relationship whereby individual contributions are re-aligned with the totalizing effects of government.

Europeana structures itself around its projected audiences. The most clearly identifiable organizational audiences are also what it relies on to provide content: both organizations and individuals donating content as well as individuals searching for content. Yet Europeana also structures itself around audiences that are less explicitly defined, such as those that are incorporated into the design of the API and the EDM, which we will address in greater detail in the next section. Europeana emphasizes the fact that it wants to incorporate/absorb existing descriptive metadata structures in use by partner institutions: it builds on many standards that are in popular use to maximize the ease of interoperability and encourage the participation of institutional partners [Europeana 2014, 12]. This type of move reflects the policy motif of unity in diversity – unification through the aggregation of diverse heritage.

When the audience is functionally a mirror of the project creators, both the EC and the tech developers, it does not necessarily reflect the way people would actually use or contribute to a digital heritage portal. As Ben Roberts writes, "how meaningful is such participation when its terms and vocabulary are decided elsewhere? Indeed, what can appear to happen in such debates is a kind of staged engagement with the outside, one which simply mirrors the political establishment" [Roberts 2009]. This tension is further complicated by the fact that success in this realm is difficult to define: while it is often lamented that students are the most prevalent group of users of the portal, it is unclear who else might use Europeana on a regular basis. The development of the EDM, to which the discussion will now turn, highlights similar issues with regard to the potential problems that arise in the uncertain space between the developers' ambitions and the needs of organizational and individual users.

#### The EDM

The Europeana Data Model (EDM) is the successor of the European Semantic Elements (ESE), metadata which were used to describe the digital objects aggregated by Europeana. Both the ESE and EDM govern the use of metadata in the larger Europeana project, with the aim of creating interoperability between discrete digital collections. The EDM came about in response to claims that the ESE was inadequate to properly express the relationships between CHOs and their digital surrogates. The EDM, a Resource Description Framework (RDF)-based data model, incorporates the existing elements from the ESE, along with additional elements from several other common metadata schemas such as Simple and Qualified Dublin Core (title, format, author, etc); it is also compatible and partly aligned with the major cultural heritage ontology, CIDOC-CRM ([Amad and Bouhaï 2017]; [Peroni, Tomasi, and Vitali 2012]). The EDM was implemented as part of Europeana's Linked Open Data (LOD) pilot. The documentation about the LOD pilot indicates the shifting nature of Europeana's project: EDM creators note the fact that the LOD pilot was limited from the outset given that the Data Exchange Agreement between donors and Europeana did not specifically call for partner institutions to give permissions to make metadata publicly available. Linked open data, as the "open" in its name suggests, is based on the ability to share metadata to make linkages work. Because the agreement partner institutions sign with Europeana does not entail public permissions, the exchanges of metadata necessary to link data openly are limited. Isaac et al write about the process of moving Europeana's database towards open data, explaining:

It was important that the solution chosen by Europeana should reuse existing standards and be flexible enough in its approach to interoperability to allow their coexistence with custom ones from across the sector. Because Europeana wants to reuse and be reused, a web-based open technology was ideal to make it simple to connect data together

and share it. Such semantic web and linked data technologies directly relate to open data strategies. [Isaac, Clayphan, and Haslhofer 2012, 40]

This type of language also exemplifies attempts by those involved with Europeana to unify elements of the project, and to project backwards a more unified vision of Europeana's development than other events on the timeline indicate. To maximize interoperability, the EDM builds on a commonly used schema like the Dublin Core Internet metadata standard. As Ashraf Amad and Nasreddine Bouhaï explain, "its primary objective is to unify descriptions originating from various metadata providers to make data accessible on the Europeana website independently of the metadata schema used by the provider" [Amad and Bouhaï 2017, 168]. In this way, cultural heritage institutions can move local data about CHOs directly into the EDM without having to do metadata "crosswalking," which is to say without engaging in the practice of translating some fields for information to match those fields existing in a different standard that might have different rules or use different types of vocabularies. This type of functionality indicates a shift away from a sole focus on schema development towards creating methods for interoperability and translation between existing schemas [McDonough 2008].

However, the creation of the EDM raised concerns about a "flattening" of relationships between pieces of information. Specifically, the need to attribute authority to particular statements presented technological challenges to the developers. We identify two sources of these challenges, although there are likely more. Firstly, the need for proper attribution stems from the complex negotiations between donating institutions who need to demonstrate clear ownership of artworks and the associated digital surrogates and metadata. Secondly, the EDM has to contend with potentially conflicting information given to Europeana by its numerous donors. RDF, the framework used by the EDM, employs simple triples to structure data: a subject and an object are linked by a predicate, or property [Cyganiac, Wood, and Lanthaler 2014].



Fig. 1 An RDF graph with two nodes (Subject and Object) and a triple connecting them (Predicate)



Figure 3. RDF triples employed in the EDM [Isaac 2013]

Europeana relies on its relationships with content donors who were, until the 1914-1918 World War I project, primarily cultural heritage institutions from the Eurozone. Such donors are contributing valuable data to Europeana: Europeana relies on these institutions to create more or less interoperable metadata on which the entire database and platform run and therefore relationships with these institutions must be cultivated. If two contributing institutions submit conflicting metadata about the same CHO, say, for example, one attributes an anonymous artwork to one artist while another institution attributes it to someone else, standard database logic does not allow for such contradictions to exist simultaneously: accommodating contradictions within a database permits it to represent all its assertions as true, as well as all its negations, which would bring down a functional database. Yet Europeana requires a structure that allows institutions to retain their own information as authoritatively true precisely because it aims to side-step disagreements about artist attribution. Therefore, developers opted for a mechanism that allows contradictions to exist within the database without ruining the database's functionality. This is accomplished through the use of *proxy* elements which attribute the authority of statements to a particular agent. Isaac et al describe the proxies as

Enabl[ing] the separation of different views of the same item that may be the focus of multiple aggregations from

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different providers. In every case, there will be one proxy for the provider descriptive data for an item and another for the data created by Europeana. [Isaac, Clayphan, and Haslhofer 2012, 38]

Europeana developed the proxy notion from the Open Reuse and Exchange (ORE) specification [Peroni, Tomasi, and Vitali 2012]. Proxies separate the items themselves from the information about them. As such, a work of art can simultaneously be attributed to two different artists with the caveat that one attribution comes from one authority, while the second comes from another.

Europeana Data Model Primer



Fig. 17. Europeana aggregation-complex case with two providers for the object

Figure 4. From the EDM primer, a diagram wherein we have noted the use of proxies (emphasis added by the authors in red).

These contradictions are especially important in the cultural heritage sector when representing information such as provenance, which can be questionable and institutionally dependent, or date ranges which differ depending on perspectives and definitions. Contradictions must be represented in a way that retains the integrity of the database structure, and this can be challenging. For example, in an LOD project using CIDOC-CRM to create an interoperable LOD dataset of World War I data and objects, the authors note: "formal encoding of such different viewpoints has been discussed, but remains future work" [Makela, Tornroos, Lindquist, and Hyvonen 2016]. The proxies in EDM are designed to accommodate both the programmers, who accept an inelegant use of RDF because it allows for functional programs, and the cultural heritage providers, who can claim authority over their own collections.

The politics embedded in the technological foundations of the EDM allow the contributing institutions a measure of autonomy that has, in turn, solidified the functionality of the Europeana project as a whole. There is a difficulty in the work of an aggregator like Europeana in that it is engaged, by definition, with many partners. As such, this tension can be described partly as one of scale: in moving beyond a single institution, Europeana must find a way to grant a visible measure of authority to many partners across many nations.

Digital archive technologies describe such problems of scale for heritage representations as technical ones, thus depoliticizing or decentring the "friction" [Tsing 2005] that inherently occurs in multi-scalar projects like Europeana. Anna Tsing uses the term friction to signal the awkward sites of interconnection across difference [Tsing 2005, 4]. Collaborative partners that share the same goals without necessarily sharing other commonalities embody a similar friction. The EDM corresponds to the way friction works, proposing a technological solution for what is an inherently political problem in a way that decenters the power dynamics that arise when actors at individual, organizational, national, and supranational scales are thrown together.

A key feature of the governmental rationality of all and each is that it can be made to accommodate the politics of difference. It is flexible and aimed at absorbing that which initially seems to unsettle it, making the seamful appear seamless [Sherratt 2015]. The use of proxies

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in the EDM is an example of this seamlessness and the way in which it is used to accommodate difference. A purposefully seamful way to handle disparities in data would acknowledge and present the difference to a user, and this could be accomplished within an RDF schema using a named graph (see [Amad and Bouhaï 2017] for an explanation of this). In the EDM, conversely, proxies are seamless in that they accommodate differences by creating silos. Within one silo, one thing is true, while within another silo, a different thing is true. The result is that, when a user is viewing information, the differences are not apparent, only what is valid within the user's particular silo is visible. We place this concept of seamlessness into dialogue with the privileged position of neutrality often afforded to technological spaces: the EDM can claim a political neutrality because it frames itself as a solution to a technological problem of data representation. In fact, we argue that the EDM, like the other technologies that together constitute the nebulous entity of Europeana, occupies a place of enormous privilege in the way it chooses to represent its heritage collections, a choice that is, in itself, inherently political.

This issue links back to the definitional void described above: the lack of definition for a European cultural heritage in Europeana mirrors a lack of definition around the European project more generally. Europeana operates as a form of soft power and a somewhat indirect arbiter, making its power all the more difficult to render visible. In entering into data agreements for aggregation, cultural heritage institutions enter into the all and each dynamic: the actions they take to exert authority over their own collections, while perhaps raising their own profile through their partnership with Europeana, are mutually constitutive of the governmental rationality of culture exercised by the EC.

## Conclusion

In this article, we have argued that the study of Europeana has much to contribute to the debates about the relationship between technical expertise, the representation of heritage, and the exercise of government. First, this case study demonstrates the move of all and each; all and each is embedded in Europeana's very invitation to participate and it implicates its conception of audiences in the same gesture. Second, it highlights the effects of a definitional void: dominant power relations fill a definitional void. The ambition of the EC is unity, but if and when it cannot express that directly, particularly in the current fraught political environment, it instead chooses to emphasize diversity. This is not a logically incompatible goal, but it moves people in an indirect trajectory towards unity: the terms change, but the goal does not.

The indirect movement towards unity is reflected in the development of the EDM, a space that masks frictional aspects of its networks and relationships [Caswell 2013]. Those in charge of technological developments have the power to remove themselves and their work from spaces of frictional engagement wherein democratically important decisions might be taken. This is accomplished by purposefully focusing on the technological problem – and its resolution – in order to depoliticize it. Hence, the problem of representing different and potentially conflicting national heritage collections becomes a technical conversation about technical problems. However, we argue that such conversations cannot happen without reference to social and political frameworks even though these tensions are masked in the organizational language of Europeana and the EC.

Friction, as Tsing describes it, has the potential to be productive [Tsing 2005, 4]. In the realm of metadata, a move towards translation across schemas, as opposed to the ongoing creation of new schemas that vie for dominance, could be one result of productive friction: such friction both requires and allows communities to come into contact. Professionalizing the task of data model creation, to unify and standardize metadata across cultural heritage institutions, is an elegant solution to a difficult problem, even if Europeana's use of RDF is a somewhat inelegant use of an ostensibly straightforward framework. But the professionalized environment in which Europeana was created is also a political one, underpinned by the drive for European cohesion, as we have shown in this article. As such, there is no requirement to open such processes up to debate in ways that preclude the project's "European" character, or to create a space for dialogue as part of the development process.

Yet, as we have also argued, technical solutions for political problems do not necessarily work, even when they "work". Responding to the questions this article raises, increasingly so because of the current uncertainty surrounding the future of the EU, demands openness of process without assuming total interoperability. To that end, we propose a challenge to the idea of interoperability as total – and seamless – assimilation. There are ways in which interoperability could be productively frictional but are not, because of the discourses of neutrality around technology and because of the political forces motivating Europeana's technological development. Europeana is not neutral, it is a project and tool aimed at promoting European unity. The totalizing and individualizing move of unity in diversity does not take account of the way different heritages also work against each other, creating a space of friction. It is from this space of friction, we argue, that we can find the means to fill a definitional void in a way that contests existing power relations. This friction has the potential to allow tools like Europeana to be used in a recuperative fashion, rather than as a technique of government on a supranational scale.

# Acknowledgments

The authors wish to acknowledge the collegial support of Dr. David Dubin in the research and writing of this article.

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