

## Articles

# NewRadial: Challenging scales and standards of humanities scholarship through new knowledge environment prototypes

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## Abstract

Even though large aggregations of humanities data are emerging through the efforts of significant federations, the larger the collection, the more difficult it is for large-scale standards to effectively account for and relate the complex variety of data objects and their characteristics. How can we simultaneously embrace this complexity with the help of the computer and achieve interoperability while still retaining the interpretative flexibility that is the heart of meaningful humanities work? Additionally, what scale is the optimal viewpoint through which we can do humanities-related work on such large data sets? At what point do we lose a humanist sensibility when working with big data, and how do we take advantage of computing technology to pluralize perspective, confront complexity, avoid reductiveness and preserve meaning as we interpret meaningful subsets of big data collections? NewRadial— an INKE prototype—addresses these questions by enabling users to connect and explore humanities databases across plural scales of engagement without imposing a universal metadata standard. Its web-based environment visually displays the objects of humanities databases in a manner that encourages browsing, searching, collecting, organizing, connecting and annotating, modelling a way to bring different standards and ontological perspectives together without negating their differences or requiring conformity to a reductive or limiting overall system.

Même si de grands regroupements de données de sciences humaines voient le jour grâce aux efforts d'importantes fédérations, plus la collection est vaste, plus il est difficile pour les normes à grande échelle de tenir compte et de dépeindre efficacement la gamme complexe des objets de données et leurs caractéristiques. Comment cela peut-il être apprécié dans toute sa complexité avec l'aide de l'ordinateur et réaliser une interopérabilité tout en maintenant la souplesse interprétative qui est au cœur même du travail significatif des sciences humaines. De plus, quelle est l'ampleur du point de vue optimal par lequel le travail relié aux sciences humaines peut être accompli selon un tel vaste ensemble de données? À quel moment peut-on perdre la sensibilité humaniste en travaillant avec de larges données, et comment tirer parti de la technologie informatique pour pluraliser la perspective, confronter la complexité, éviter le caractère minimaliste et préserver le sens à mesure que l'on interprète les sous-ensembles significatifs des grandes collections de données? NewRadial— un prototype de INKE—répond à ces questions en permettant aux utilisateurs de relier et d'explorer les bases de données de sciences humaines à travers une pluralité d'échelles d'engagement sans imposer une norme universelle de métadonnées. Son environnement internet affiche visuellement les objets des bases de données de sciences humaines de façon à encourager la navigation, la recherche, la collecte, l'organisation, la connexion et l'annotation, en servant de modèle pour démontrer un moyen de rassembler différentes normes et perspectives ontologiques, sans remettre en question leurs différences ni exiger la conformité à un système global réducteur ou contraignant.

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## Scales:

Until computers are able to "read" inferentially for us and are able to effortlessly correlate and merge most of the world's data sources, a major challenge for humanities scholars in computer-enhanced research environments is how to collect, connect and curate specific sources from large, numerous and often remote and disconnected databases. Many existing tools encourage large-scale data analysis and visualization, but this simplifying and ultimately reductive form of quantitative processing and pattern seeking is a useful enhancement for, rather than replacement of traditional scholarly practices and methods which rely on mapping argumentative vectors through representative selections. Put another way, Franco Moretti's model of "distant reading" ([Moretti 2005](#), 1), enabled by a computer's ability to statistically process large data sets, does not replace close reading—it supplements scholarly traditions by pluralizing and enriching perspectives. As Scott Weingart suggests, our challenge, "as researchers on the forefront of network analysis and the humanities, is to tie the very distant to the very close.... [and] reconnecting the big with the small will hasten a national discussion of the ethical norms of big data and network analysis" ([Weingart 2014](#)). While it is useful to maintain close reading opportunities in digital environments, how can we use computers to effectively explore, participate in, contribute to and "deal with" the proliferation of large-scale digitization projects, big data sets and larger collections of primary cultural material on a human scale? Since close and distant readings are both forms of reading, or making meaning out of mediated signs, regardless of the scale or particular kinds of patterns that are recognized, nothing about this process is entirely unfamiliar. While some critics (such as Villem Flusser) anticipate as-yet unimagined forms of scholarly work within digital spaces, current computer-enhanced research environment prototypes support a rich hybridity of linear logic mixed with constellative and aggregative opportunities. This follows Tim Hitchcock's suggestion that "we are slowly creating an environment like Katy Börner's notion of a Macroscope - that set of tools, and digital architecture, that allows us to see small and large, at one and the same time" ([Hitchcock 2013](#)).

Imagine a *Google Earth*-like opportunity to move between the "street view" of a close reading environment through aerial views of the inferences, influences and dynamic constructions that emerge from the routes that grow up around a text, to satellite views of larger, constellated fields of contextual data. What kinds of scholarship and scholarly communication would be enabled by such an environment? How would the inclusion of mapping and terraforming tools (that parallel the functions demonstrated in a game like *Minecraft*, or within *Outerra*'s impressive planetary mapping demo and sandbox prototype) encourage further occupation and influence ([Outerra 2015](#))?

Inspired by scalable, dimensional and dynamic virtual spaces as well as Massively Multiplayer Online Role Playing Games (MMORPGs) that model the political and social densities of vast narrative universes (such as *EVE Online*) but still allow users to maintain personal perspectives, the *NewRadial* research group, part of INKE's Modelling and Prototyping team, has been extending the functionality of the *NewRadial* environment to allow users to work with material curated from larger data sets ([ARC 2015](#); [DPLA 2015](#); [Europeana 2015](#)). The *NewRadial* prototype is a web-based digital environment for humanities research and collaboration that encourages users to occupy, search, sort, and annotate database objects in a visual field. Unlike analytic platforms, which offer tools for counting, sorting, tallying and otherwise data mining a corpus, it has been designed to function as a workspace in which primary objects from existing databases can be browsed, gathered, correlated, and augmented by multiple users in a dynamic visual environment. In addition, *NewRadial* offers a space in which secondary scholarship, exchange and debate can be centralized and mapped onto the primary data without deforming or destabilizing the original databases.

Fundamentally, the *NewRadial* team is working from a metaphorical foundation that draws from and extends Bob Stein's idea that the book is a place ([Stein 2013](#)). The implications of this idea are broad: if books are places, then due to their manufactured condition, they are akin to architectures. They are designed to be occupied, to be inhabited by readers, but also determine how readers can behave and what they can do. In this way, the printed book is akin to a largely private, single-user space. Despite this private nature, asynchronously shared and mass reproduced book objects have still been able to generate communities who have awkwardly tried to overcome the social constraints of the book's materiality and distribution via reading groups, and critical scholarly communication layers. In contrast, the social networks, multimedia opportunities and inherent flexibility related to digitally iterated bookspaces can be harnessed to extend the affordances of their print-based counterparts and—in experiments such as *Socialbook* can host a true community of users simultaneously in the margins of a single, shared site ([Socialbook 2015](#)). However, in *Socialbook*, the book is still a place, a fixed arena that defines a limited circumference within which navigation and critical construction can take place.

In contrast, our *NewRadial* prototype attempts to scale up from the book-based perspective of *Socialbook* without losing sight of the importance of close reading, and distinguish itself from the place metaphor by asserting itself as an environment. *NewRadial* is not in competition with the places generated by *Socialbook*, but should be developed to work interoperably with this and other digital reading and writing architectures to allow readers and scholars to broaden their perspectival horizons. While *Socialbook* invites commentary within book places, *NewRadial* enables the collection and integration of such places and the mapping of commentary among them. In other words, linking *NewRadial* with other tools like *Socialbook* could allow for zooming in, out and through different perspectives or scales (inclusively enabling and connecting different kinds of perceptions and work). In the same way that video games often include a number of pre-set camera angles (or perceptive positions) that a user can cycle through, users of a browsing, collecting and annotating environment that aggregates a number of different tools in a scalable fashion may have individual perceptual preferences, but should not be prevented from exploring the possibilities enabled by moving through compatible scales of text and context.

The trilogy of *Mass Effect* games, created by Bioware and published by Electronic Arts, positions the player as the commander of a spacecraft and uses a unique holographic in-game interface to determine routes through the universe of the game. The player can explore the map on a variety of scales, from galaxy overviews to particular solar systems: users of this type of scalable map retain an awareness of the whole while also navigating through the particulars of the represented environment. *NewRadial*'s development team recently created an adapter to display data objects in *NewRadial* from the ARC (Advanced Research Consortium) federation of humanities databases, and modelled the display results after the above type of scalable map ([ARC 2015](#); [Saklofske and the INKE Research Team 2015](#)). Instead of replacing the entire view with a new scaled perspective, though, we chose to map the contents of exploded nodes onto the same space as the original nodes, producing an environment that hosts multiple scales of information simultaneously. This allows users to insert connective commentary and to construct groups that bridge multiple scales of data representation. While our original adapter featured parent-child node organization by federation, database and object scales, problems related to the internal consistency of the ARC index necessitated a revision to this adapter that now makes use of an alternative pre-organization that scales through project, archive and object levels.

Although we ultimately envision *NewRadial* as one link within a chain of related tools that could encourage users to fluidly move among scales of information, we are already examining this scaling and "drilling" potential within the prototype itself to illustrate the benefits of bridging close reading environments with big data visualizations. Because our INKE prototype imports database content via adapters that can make use of metadata to pre-render the data into categorical nodes or clusters, *NewRadial*'s nodes can thus represent larger data categories that can be exploded to display all of the individual pages or objects (child nodes) within that

category, or collapsed back into their parent nodes. This layering process allows users to explore individual data objects and larger categories simultaneously in the same visual space. Crucially, edges or groups (sites for critical commentary) that are generated by the user can connect to and contain nodes from different layers, enabling commentary between scales in a single visual environment.

*NewRadial* is a way to start thinking of humanities scholarship towards a universal scale, but instead of creating a static visualization that serves as an endpoint of analysis, we are attempting to model a dynamic navigation interface as a means through which we can explore the surface detail of data objects and also explore their relations within systems of communication and idea inheritance. But simply navigating through this universe is not enough. Scholars are not just travelers: they are engineers, creators and curators who systematically aggregate, remix and classify data in an effort to discover and establish rhetorical patterns of illumination and understanding. Thus any pre-rendered systematization can be easily affected by the impact of scholarship within a knowledge environment. Our work leaves traces, which we are ultimately responsible for. Unlike *Mass Effect's* navigation interface, *NewRadial* offers pre-defined configurations for its data displays that can be overridden and permanently marked by user modification and in doing so extends this creative and critical flexibility to the traditional products of scholarship. Rather than a guide to the galaxy, then, *NewRadial* functions as a dataverse manipulation kit. While the *NewRadial* interface and adapters realize orbits and gravities among metadata categories and data objects, these relationships can be complicated through user contributions and curation in the same way that critical scholarship can challenge or strengthen assumptions and existing interpretations. *NewRadial's* collection feature allows users to focus on a collection of selected and organized objects from a number of sources and searches, to move beyond a single focus but not to get so lost in an overwhelming volume of data that particular examples lose their illustrative importance. This is not all that different from what humanistic scholarly inquiry does already, but *NewRadial* assists in preserving the manageability and humanistic scale of scholarship in the presence of large-scale computer-enabled databases of cultural data.

By enabling an opportunity for scholarly responses within and among flexible perspectival scales, *NewRadial* encourages users to etch new routes of narrative meaning and participate in critical conversations within a map of aggregated cultural data objects. *NewRadial* is thus more properly conceived of as an environment, a conditionally determined setting that hosts users and data resources at a scale where users encounter and impact those resources via curation and comparative commentary rather than close reading practices. In the *NewRadial* environment, scholarly engagement becomes a dynamic record of use and dialogue that builds up within a malleable and scalable space of primary textual data. This is distinct, yet not completely divergent from the static, siloed, and monologic declarations of independence asserted by traditional print-based monographs and the responses they provoke. The *NewRadial* environment and its collection and curation functions can still play host to large scale scholarly projects that emulate monographic efforts. However, its dynamic social constitution challenges the inherently insular authoritativeness and finality of the traditional monograph while preserving the potential for comparative analysis and argumentative progress on a number of different scales.

A colleague of mine, who was recently teaching an undergraduate history course on the history of genocide, was struggling with ways to represent, in meaningful ways to his students, the extent of the mass murder that has gone on in the world. On the one hand, identifying particular people, names and families and exploring the specific habits that families engaged in prior to being thoughtlessly effaced, is one way of understanding the weight and brutality of the act as well as identifying with victims of genocide on a sympathetic and even empathetic level. This is akin to close reading practices. This is a microcosmic perspective that allows one to perceive relatable details about a particular participant. On the other hand, there is something to be said for large statistical representations of data (such as the number of people killed in a genocidal event). The numerical quantities related to large scale genocides are staggering, and representing these quantities statistically is a reductive process, but can also precipitate quite an intense reaction, as a viewer can be made

to witness the extent and scope of the event being represented and the scale of its impact. At what point, though, do we lose a humanist sensibility when working with big data? At what scale do the data objects lose their specificity, their humanistic characteristics? What is the ideal scale, the maximum distance from the close encounter with a cultural text or object that one can occupy before particulars become meaningless for humanist work? Conversely, but no less importantly, it is equally problematic to ignore larger scales of meaning and perspective by focusing exclusively on minute particulars. What scale is the optimal viewpoint through which we can do humanities-related work on large data sets? How do we take advantage of computing technology to pluralize perspective, confront complexity, avoid reductiveness and preserve meaning as we narratively curate and interpret meaningful subsets of big data collections? Our natural tendency is to generalize, to categorize individuals into archetypes, and to reduce the high resolution detail of millions of people into manageable statistical chunks and models. This is the only way we know how to make meaning out of mystery: reduce the complexity of the microcosm and macrocosm into an empty middle, and put them both over a common denominator of dehumanized mathematics and logical systems.

Via *NewRadial*'s combinatory functions and inter-scale modelling, suturing the "specific form of knowledge" enabled by Franco Moretti's distant reading models (2005, 1) to the microcosmic immersion of close reading practices encourages free movement between scales, neither denying the pleasures of close reading nor the exhilaration of looking over large and often fluid maps of cultural data, but instead preserving and pluralizing these perspectives through the elimination of their segregation and theoretical opposition. In fact, embracing the compatibility of these scales through specific prototypes (and increasing the complexity of our perceptions at the same time) might just lead to a recognition of similitude between perspectives. Looking for large-scale statistical patterns in vast databases and database federations is similar to tracing networks of relation amidst the social plenitude of well-populated novels and to uncovering the inferential subtleties of linguistic relativity in poetic analysis. Curiously, Moretti's methods of abstraction are not all that different from interpretative reduction that results from close readings. In a sense, all of these activities are forms of abstraction, but they are also ways of tracing particular circuits, particular journeys through complicated networks. Correlating such circuits through scaled perspectives will counteract reductivity by confronting the meaningful complexity at the heart of humanist networks of communication and meaning.

*NewRadial* is being offered as both a bridge between close reading and big data perspectives, and as a tool for not only tracing humanist paths through these perspectives, but for aggregating such contributions into its socially-networked environment. *NewRadial* combines and extends the potential usefulness of Moretti's graphs, maps and trees, but also refuses to subscribe to the idea that humanities data can or should remain independent of interpretation. Roads more and less-travelled will emerge from the occupation of this data when the visualized nodes are not just surveyed by users, but connected, curated and USED in productive ways.

The Humanities are facing a digital turn that is forcing us to reconsider our scholarly communication traditions as we establish future potential. Narrative is a traditional and efficient habit of reductive pattern seeking, a mode of perception that is now almost reflexive in the presence of complexity: it is how we cope with and understand the world. Shared narratives (either common patterns or the collection of many voices) counteract this reductive action through the constitution of complex response communities. Thus, while narratives can be reductive in the sense that they can help to filter out omniscient noise, they have also essentially functioned as a primary tool of scholarly communities and communications, leading to shared networks of understanding. However, dynamic scholarly communities are constituted not simply by narrative, but also by environments, by complex systems of interaction and exchange between writers, texts, contexts and readers. Narrative is a way of mapping specific journeys through such environments, generating perspectival utterances and establishing patterns of interpretative understanding that form the basis of scholarly communication.

As an argument that calls attention to the need to explore humanities data across plural scales of engagement in order to preserve and evolve current scholarly and critical practices, *NewRadial* bridges the sometimes too-specific granularity of close reading and the sometimes too-general categorizations of big data statistical processing. It offers a technologically-enabled middle ground in which critical scholarship can operate in larger fields of meaningful complexity and interrelation via computer-enhanced curation, narrative, dialogue and pattern-making without the need for reductive or simplifying gestures.

## Standards:

In addition to the potential enabled by encouraging the interoperability among different scales of information in digital humanities work, there is still the question of how scholars can successfully search for and make use of the kinds of information that they require from broadly scattered database initiatives across the web. Despite the unfortunate persistence of paywall-accessed cultural data and the underlying issues of sustainability and monetization, there is now, more than ever, unparalleled open access to significant volumes of humanities content online, and the challenge for the 21st-century scholar is what to do with, how to aggregate and how to communicate meaningful encounters with such material. However, even tools developed to handle big data sets are often limited by the lack of ontological standardisation among distinct metadata models or index structures. How, then, to allow the scholar to collectively access, productively sift through and simultaneously work with such disconnected, varied and potentially incompatible database content in the same way that a user can plug two URLs into the front page of *Voyant Tools* and engage in a computer-aided text analysis of multiple documents or upload two documents to *Juxta Commons* for comparison and collation ([Juxta Commons 2015](#); [Voyant 2015](#))?

Large-scale aggregation initiatives such as ARC (and NINES, 18<sup>th</sup> Connect and MESA), the Digital Public Library of America (DPLA), and Europeana attempt to do this by requiring that all participating database archives agree to a "social contract" by standardizing their metadata (for example, the metadata requirements for NINES and 18<sup>th</sup> Connect include Dublin Core Metadata Terms, RDF terms, and custom Collex terms). Even though large aggregations of humanities data are emerging through the efforts of these significant federations, these initiatives still rely on distinct knowledge models and metadata standards, and each standard is varied enough to interfere with (or at least make difficult) broader correlative intentions. As well, the bigger the data set, the more difficult it is for large-scale standards to effectively account for and relate the variety of data objects and their characteristics, and particulars are easily lost within larger efforts to manage data sets through categorical metadata frameworks. The inherently persistent complexity of datasets, despite efforts to simplify their indexical relationships via categorical metadata standards, challenges efforts to aspire to the kind of interoperability and inferential processing envisioned by proponents of the semantic web.

Advocating for a shift from descriptive to relational metadata in 2001, Tim Berners-Lee suggested that linked data is the necessary future data model in an information-rich world, because not only do our traditionally tabular ways of structuring data resist the automation of associative and inferential processing, but our current models for searching through the data supplied by such information networks are also woefully insufficient. In the same article, Berners-Lee also suggests that "like the Internet, the Semantic Web will be as decentralized as possible," noting that "decentralization requires compromises" but also encourages "unchecked exponential growth" ([2001](#)). The automation of associative or relational meaning-making via semantically defined relationships across information networks is an inspiring vision, but the problem is that there is no single standard of relational meaning, no universal ontological vocabulary to precipitate machine-assisted correlations and aggregations. As a result, there are no inference engines that effectively make use of humanities data. Even though large searchable aggregations of data are being generated through federation practices that are based on particular standards, these standards, like nation-states, are varied and distinct enough to prevent a broader interoperability. Caught up in the excitement of Berners-Lee's call to add logic to



the Web-the means to use rules to make inferences, choose courses of action and answer questions-thereby encouraging the production of machine-readable information that could be used to automate pragmatic queries, much digital humanities research energy is spent engaging in debates regarding knowledge modelling and standards. Large-scale cultural and humanities databases offer diverse ontologies-competing classification monopolies-and this parody of corporate competition resembles an ontological gold rush, rather than a communal step towards semantic web ideals and functionality.

Perhaps, as humanists, we are looking at this all wrong. Perhaps we do not need to automate the logic of the web in relation to cultural and critical analyses. Yes, as the amount of accessible data becomes unwieldy, automated searches, associations and sorting become more desirable. However, automation resists accident, the kinds of accidents in lateral logic or figurative (dare I say POETIC even) associations that ignite new perspectives and illuminate unique forms of understanding. While the kinds of standardisation and automation envisioned by proponents of the semantic web are helpful for modelling efficient schedules and cost-effective practices (a wonderful tool for profit-oriented businesses), how can we, as curious humanities scholars, make use of the computer to embrace this complex potential of scattered data and achieve a measure of helpful and aggregative interoperability while still retaining the interpretative flexibility that is the heart of meaningful humanities work?

*NewRadial* mixes automatic and manual opportunities: automating the connection to and searching of databases via javascript adapters (without imposing a universal metadata standard or requiring participating databases to adopt a particular metadata profile) while encouraging manual collecting, commentary and mapping. It is a web-based environment designed to visually display the objects of humanities databases in a manner that encourages browsing, searching, collecting, organizing, connecting and annotating. Content (either locally hosted or called via a public API) is introduced into the *NewRadial* environment via small javascript adapters that make use of a database's existing metadata standards to usefully search for and represent data objects on *NewRadial*'s canvas. This robust adapter system means that databases do not need to standardize their organizational structures to function in the *NewRadial* environment. Our hope is that those who adopt the *NewRadial* environment for particular projects will write their own adapters to query and display results from databases that are pertinent to the research communities that particular installs serve. This end, we are working to prototype adapters for a wide variety of database content to demonstrate the breadth of content that can be accessed and combinatively curated through the *NewRadial* interface. An adapter created in October 2013 to call results from the ARC web application programming interface (API), has been supplemented by adapters for the DPLA and Europeana APIs. Not only can participants use *NewRadial*'s unique environment to browse, search, collect, organize, connect and annotate digital objects from each of these federations separately, but—via *NewRadial*'s inherent meta-adapter function and collection option—search results from all three federations can be simultaneously displayed, manipulated, curated and commented upon in the same visual field. This functional and productive interoperability among large data sets through the *NewRadial* lens offers a humanistic alternative to the Herculean (or perhaps Tantalean or Sisyphean) task of universalizing overarching metadata standards or ontological frameworks towards a semantic web ideal, and yet it still achieves some of the initial ideals suggested by Berners-Lee (2001):

The real power of the Semantic Web will be realized when people create many programs that collect Web content from diverse sources, process the information and exchange the results with other programs. The effectiveness of such software agents will increase exponentially as more machine-readable Web content and automated services (including other agents) become available.

We are not creating interoperable programs that require semantic web standards to automate data associations, but we are using interoperable adapters within the same new knowledge environment. But why

should we not work towards metadata standardization? After all, *NewRadial*'s javascript adapters are less flexible than making use of RDF and ontological frameworks. As well, creating a new adapter for each new database is fairly inefficient (though we are working on an adapter generator that will automatically generate adapters based on particular metadata profiles). Standardizing metadata means that computers can take care of the arduous task of sorting and displaying particular datasets. As well, shared profile standards, along with a commitment to a rich semantic associative layer would precipitate a stable, somewhat centralized and more easily manageable form of data integrity, not to mention a more efficient experience for the user. So, again, why not work towards metadata standardization? Is not *NewRadial* a counterproductive avoidance strategy, a backwards glance o'er anachronistic data paths? If our ideal is to frame every database initiative within a common metadata standard, then: yes. However, the web was envisioned as a place where individual expression and esoterica could flourish. Berners-Lee's (2001) complaint was that "to date, the Web has developed most rapidly as a medium of documents for people rather than for data and information that can be processed automatically." His problem is our advantage: the humanist web is already in place, and the mechanical web is still in development. As a Digital Humanist (one who sees "Digital" as an adjective, as a significant and important modifier, but not as an equal to the definitive, foundational power of the "humanist" noun), I am less concerned with automating the discovery of meaningful relationships between data objects and more concerned with enabling a richer field for the study of human cultural history on a humanist scale. I do not think the two are entirely synonymous.

*NewRadial* respects the individual metadata models of the archives it queries. One could metaphorically say that *NewRadial*'s adapter model of interoperability is "culturally sensitive." No database needs to conform to an overarching standard to participate in *NewRadial*'s feature-rich environment. Instead of requiring that all participants share the same or even similar vocabularies (speak the same language) and follow the same metadata standards (worship the same gods), which resembles a colonial hangover, *NewRadial* encourages integration in a united nations-like adapter process, in the same way that the technologically enhanced interpretation system in the UN enables global representatives to connect and communicate (without requiring that they all speak English, for example). A public API (a declaration, definition or constitution) from each entity is all that is required to support a system that is designed to bring different structures together, an environment in which these distinct societies can come together via a process of adaptation. None of the participants need to redefine their metadata or adapt to others or to overarching standards to join in these reindeer games, but all can be respectfully adapted to *NewRadial*'s field of vision, and resultingly occupy a communicative space together in ways that they would be unable to do otherwise without standardizing or correlating their metadata (i.e. hiding their red noses). While it does make more sense, from efficiency and scholarly validation points of view, to strive for standards and ontological compatibility, *NewRadial*'s flexibility generates an inclusive and egalitarian space where independent and personal database content can be comparatively explored alongside these larger federated motherships.

In a sense, the way that *NewRadial*'s javascript adapters process the data returned from a web API query emulates the ways that server-side XSLT can transform XML in a browser window. The main difference is that *NewRadial*'s adapters do not define a static display template, and unique metadata associated with each particular data object (preserved by the use of *NewRadial*'s javascript adapters) is not subjected to a reductive common data schema/ontology by the *NewRadial* interface. In fact, this environment opens up the opportunity for users to supplement existing data object metadata with commentary and associative links. The *NewRadial* canvas is dynamic, and a user can manipulate the arrangement of and commentary related to content once it appears in the browser interface. For example, our current iteration of the ARC adapter delivers results in categories that replicate ARC's own self-defined resource hierarchy, but we can still re-search, sort, filter, group, connect, collect and annotate the nodes by federation and other metadata parameters after viewing the initial results.

In addition to respectfully validating a database's own standards via adapter design, *NewRadial* can also



generate meta-adapters out of its existing adapters, allowing integrated search results that displays content from usually incompatible databases. But does not Google already do that for the world wide web? Not exactly: Google crawls pages, sorts and indexes them, then offers tools to search the index. Results of the search are ranked by over 200 factors and displayed. *NewRadial* makes use of adapters that are created based on existing APIs and metadata or markup, but automatically creates a custom meta-adapter (an adapter for adapters) based on a user's selections from the adapter selection screen so that all sets of returned content can be displayed and manipulated simultaneously and collectively. The main difference between *NewRadial* and a wide-ranging search engine is the ability of *NewRadial* to re-present data objects as manipulable nodes in a shared space that becomes a workspace for the productive curation and critical extension of that data.

*NewRadial*'s meta-adapter system models an alternative to the standardization of metadata or the unification of different ontological frameworks. Its meta-adapter function is designed to bring different standards and ontological perspectives together without negating their differences or requiring conformity to a reductive overall system. This environment becomes a shared field of vision, and in this field a knowledge community can collaboratively generate linked-data-like folksonomies (via a commenting function that establishes connective edges between data object nodes or groups of objects). Folksonomy edge and group creation constitutes interpretative scholarship, and *NewRadial* establishes a space in which folksonomy can (but does not have to) lead to consensual ontological constructs over time, a space in which the richness of individual perspectives can still thrive in the midst of collective emerging organizations. Much like traditional scholarship, in which a knowledge community makes use of flexible critical tools to generate shared vocabularies and agreed-upon systems, *NewRadial* merges the flexibility of the folksonomy instance with the generative opportunity for broader ontological classes. And this work (collections, connections and comments) can be exported in xml or json format, meaning that *NewRadial* is intended to be used as a transition point rather than a destination, a through-point for a particular kind of manual scholarly processing that can be done with broadly scattered data. It is a platform for this emergent and evolutionary process that makes an argument for avoiding ontological design by committee, extensive automation and pre-rendering, for preserving happy accidents, esoteric collections and unpredictable association in humanities cultural research and scholarship.

Finally, a word about open culture: What does *NewRadial* rely on for this adapter-model to function properly and broadly?

- Not all APIs are the same: *NewRadial* relies on a well-developed API.
- Thorough API documentation is necessary for adapter development and maintenance.
- A public API is necessary, as any restrictions limit the unrestricted use of *NewRadial* or similar tools.
- While freely accessible content and open-access data are not absolutely necessary for *NewRadial* to function, its potential can only be fully realized when the databases that it accesses allow for open access to full versions of cultural data objects.
- API stability and index integrity are essential, but if changes or evolutions in either are implemented, organizations that maintain such databases need to clearly alert tool developers who have made use of their public API.

*NewRadial*'s functionality depends on the stability and consistency of the independent databases that it queries in the same ways that ARC, Europeana and DPLA depend on the stability of the databases that they federate. This is a version of trust that decentralizes responsibility to the data sources. And even if something does change, minor changes to *NewRadial*'s javascript adapters ensures continuous compatibility.

## Conclusion:

Communication and compatibility between database collections, along with scaling options that encourage us

to confront the complexities at the heart of human cultural history are essential to extend and diversify the ideas and practices related to secondary scholarship activity in a digital frame. However, to avoid reductive homogeneity, compatibility does not have to be the result of standardization (like adopting a fashion style to define oneself as part of a group), the discovery of meaningful relationships does not have to be automated (like subjecting your search for a soulmate to e-harmony's algorithms), and big data aggregation should not eclipse the individual data object. *NewRadial*'s adapter-based design, meta-adapter functions and scaling display collectively offer a unique and innovative strategy to interrogate traditional and emerging scales and standards of humanities scholarship in new knowledge environments. This argument is not simply pragmatic or a benign justification of adaptive design strategies. It is political. It demands that politics and critical theory not be excluded from Digital Humanities related research, development, design or implementation. *NewRadial* is a cautious, prototypical first step towards creatively engaging with Deleuze and Guattari's model of generative "becoming" (as defined in [Heckman 2002](#)), affirmatively acting upon the idea that "to think ontologically is to fall into the same trappings of the State exerting its control over its territory" ([Foster 2014](#), 132) and avoiding a new iteration of old paradigmatic ways of thinking.

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