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What gets categorized counts: Controlled vocabularies, digital affordances, and the international digital humanities conference

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Abstract

This article explores how terms are incorporated into the conference submission and review process for the international digital humanities conference. This article provides an overview of the Alliance for Digital Humanities Organizations (ADHO) conference reviewing process and how the controlled vocabulary structures the review process. We show how expanding and rethinking the controlled vocabulary can impact the experience of those who submit, review, and attend the conference. We consider how ConfTool, the submission and reviewing portal used for the international digital humanities conference, processes the controlled vocabulary and algorithmically influences the review of submissions. Ultimately, we advocate for the ability to make intentional and careful changes to conference vocabularies including considering the adoption of a formal ontology. We also suggest that changes to the ConfTool algorithm are needed to ensure a diverse and equitable future for digital humanities.

> Each standard and each category valorizes some point of view and silences another. This is not inherently a bad thing—indeed it is inescapable.
>
> —Bowker and Star (2000, p. 5)

As a feminist geographer Seager (2016) asserted, and Klein and D'Ignazio (2020) reminded us, 'what gets counted counts' (2020, p. 97; see esp. Chapter 4); the corollary to this is 'what gets categorized counts'. Within the digital humanities, there are intersections among counting, ontologies, vocabularies, and digital technology. One digital humanities definition of ontology is 'a system for organizing knowledge that describes and defines relationships among things within a domain' (Usiskin, 2020, pp. 184–98).[1] Whether you call it categorization or ontology, we depend on the identification and assignment of classification of items to render visible structures of meaning and organization. Sometimes called keywords or topics, controlled vocabularies, taxonomies, or ontologies,[2] the reality is that digital humanities frequently rely on slippage between these terms to organize itself. In this article, we use the term 'controlled vocabulary' to describe the list of terms that is used in the conference submission and review process for the international digital humanities conference.[3]

Many digital humanities projects use controlled vocabularies and ontologies to categorize, quantify, and/or make their objects of study findable.[4] Posner (2021) notes that humanists are trained to destabilize ontologies and deal with 'necessary incompleteness' in their research; whereas 'ontological stability' is a bedrock of computer science, information science, and library science, in order to create research that is quantitative and replicable. As Posner puts it, 'If we don't categorize, we can't count or query, and if we can't count or query, we can't visualize'. There are also, as Simpson *et al.* (2013) note, 'inherent consequences to [creating and using an ontology] that are both "real world" and potentially serious'. Effectively, we count and categorize from our own position of subjectivity and often, in practice, render our biases programmatically through the implementation of structures that affirm our own position. These are the keywords, controlled vocabularies, or ontologies of conference organizing in the digital humanities and beyond.

Digital humanities conference controlled vocabularies are used to categorize the kinds of research being

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undertaken in the digital humanities. There is, of course, a longstanding (if not always codified) practice of categorizing digital humanities work: it shapes tool directories, course registries, and the pages of links we offer. Perhaps the best-known ontology about the digital humanities is TaDiRAH (the Taxonomy of Digital Research Activities in the Humanities) ontology—which was built on previous attempts to categorize digital humanities projects, such as Digital Research Tools Directory (Grant *et al.*, 2020), the arts-humanities.net taxonomy of DH projects that became DH Commons, and the DARIAH 'Doing Digital Humanities' Zotero bibliography (Dombrowski and Perkins, 2014). The TaDiRAH ontology is designed 'to be particularly useful to endeavors aiming to collect information on digital humanities tools, methods, projects, or readings' (Taxonomy of Digital Research Activities in the Humanities [TaDiRAH], 2014)[5]: it groups digital humanities research into broad categories such as 'analyzing', 'capturing', 'disseminating', and 'enriching', then subdivides those categories, while recognizing that their taxonomy categories are not mutually exclusive (Taxonomy of Digital Research Activities in the Humanities [TaDiRAH], 2020).[6] TaDiRAH is an 'open' taxonomy; that is, one that is made public and offered for re-use (TaDiRAH, 2014, 2020); it has been adapted and incorporated into other efforts like the Network for Digital Methods in the Arts and Humanities (NeDiMAH) Methods Ontology (n.d.).[7] To our knowledge, the TaDiRAH taxonomy has only been applied to digital humanities conference organizing once: to classify submissions to the DHd 2016 conference (TaDiRAH, 2020). The reality of digital humanities conference ontologies and controlled vocabularies is that, all too often, the ways submissions are categorized (either by submitters or organizers) is not made clear to participants.

We are constantly creating, adopting, and changing controlled vocabularies about our fields of scholarly research: ontologies are the result of how we model data, that is, conceptualize and think about our digital projects.[8] Ontologies, though, occupy a broader swath of the field than we might otherwise recognize. Keywords, filtering, and structured meaning-making are common in activities like search-engine development, cataloging, and digital collections creation, but they also insert themselves into activities like grant identification, articles, and event planning. This article focuses on one such intersection between controlled vocabularies and the digital humanities: the conference submission.[9] Conference vocabularies both reflect and shape assumptions about the field. They therefore represent what organizers deem important enough to merit recognition as a category.

For the international digital humanities conference, which is organized by the Alliance for Digital Humanities Organizations (ADHO), controlled vocabularies are used primarily in two ways for the purpose of organizing conference submissions and reviewers:

1) When individuals upload an abstract submission, they are asked to select from a limited list of items.[10] These identify what languages, geographies, temporal periods, methods, and disciplines/fields of study best describe the submission.
2) When an individual is identified as a potential reviewer, they are asked to select their areas of expertise from the same controlled list that categorizes abstract submission. These are intended to identify what languages, geographies, temporal periods, methods, and disciplines/fields of study the reviewer is willing to complete review activities for and to align those experts with the appropriate submissions.

Taken together, these identifications are used to filter and assign potential reviewers through the conference management submission algorithm provided by the ConfTool system that we discuss in more detail below.[11] Controlled vocabularies that are attached to submission and to reviewer expertise allow the activities of assessing scholarship to operate. Thus, the design of controlled vocabularies has a significant impact on the potential review process, as poor design and selection can skew potential reviews and impact acceptance into the conference's scholarly program.[12] Beyond the review process, controlled vocabularies also become ways for attendees to navigate the conference program and to assess the breadth of conference submissions about a given geography, time, method, or field of study. It also reflects conceptions of the digital humanities and the humanities more broadly.

This article provides an overview of the ADHO conference reviewing process and how the controlled vocabulary structures the review process. We show how expanding and rethinking the controlled vocabulary can impact the experience of those who submit, review, and attend the conference. We consider how ConfTool, the submission and reviewing portal used for the international digital humanities conference, processes the controlled vocabulary and algorithmically influences the review of submissions. While this article takes the DH conference as its example, the arguments here intervene in larger conversations about scholarly communication and, in particular, conference organizing. Things that might be taken for granted, such as keywords or subject areas, are actually powerful tools of inclusion and exclusion. In organizing our conferences, we are in fact legitimating and reinforcing

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systems of knowledge and belonging. The choices that go into this must be purposeful and transparent.[13]

1 An overview of the DH conference reviewing process

The context for this assessment starts in 2017 when we became co-chairs for the DH2020 conference. This is the annual international conference of the Alliance of Digital Humanities Organizations (ADHO), which is itself an umbrella organization that brings together regional, national, organizational, and linguistic-based digital humanities groups.[14] Although the DH2020 in-person conference was canceled because of Covid-19, most of the conference organization had already taken place, from the calls for papers, receiving submissions, peer reviews, author responses, and scheduling the panels and events themselves. Much of the labor of the conference relied on controlled vocabularies: from authors identifying the topic(s) and approach(es) of their submissions to reviewers indicating their areas of expertise, which, of course, formed the basis for review assignments and ultimately shaped the intellectual content of the conference.

For DH2020, as with many other conferences, controlled vocabularies intersected with author submission, reviewer identification and assignment, and schedule planning. In 2018, program chairs Ortega and Worthey used a pre-existing list of topics that were carried over from 2017's ConfTool installation as an 'ontology of sorts'. As the chairs noted in their conference report, revisions to the topics list was an 'important acknowledgment of the conference theme, and a contribution to understanding and acknowledging changes in the field'.[15] Calling on future conference chairs to update the vocabulary through expansion, they acknowledged that the use of existing conference vocabularies did not necessarily support 'the observed DH practices gaining prominence around the world, the intersections of DH with other adjacent and closely connected fields, and an examination of the common DH practices in Latin America' (Ortega and Worthey, 2016). In this case, the challenge was that there needed to be additional categories and the relationship between categories needed reconceptualizing.

Ortega and Worthey (2019) were following a common pattern for the international Digital Humanities conference: inheriting a controlled vocabulary in the ConfTool system and then making slight adaptations based on emerging interests or areas of research. For the 2016 conference, for example, program chair Thaller (2017) added 'Slavic Studies' to the vocabulary list at the request of a conference submitter (Ortega and Worthey, 2018).[16] Yet, despite this change in 2016, the vocabulary addition was not permanent. DH2020 had to re-add Slavic Studies to the controlled vocabulary as it was apparently removed sometime between 2016 and 2020. Nowviskie (2012), the 2012 Program Committee chair, noted a similar process. She also noted that the Program Committee itself played an important role in refreshing, extending, and modernizing the list of topics.[17]

There has been, to date, no documentation of the history of the controlled vocabularies used in DH conference organizing. As such, we reached out to former conference organizers (see note 15), who pointed to the 'AHDS [Arts and Humanities Data Service] Methods Database' as a classification system used by ADHO conference organizers as early as the DH2007 conference. The AHDS Methods database was developed at King's College London in 2005, a JISC- and AHRC-funded program, directed by Sheila Anderson and developed in part by Reto Speck. This list was also used by arts-humanities.net and the NeDiMAH.[18] This brief history of the DH conference vocabulary emphasizes that the keywords and topics used across years were not stable: although each new set of conference organizers inherited the previous year's work, they often re-shaped it in order to best arrange, coordinate, and showcase the work by researchers.

Significantly, program committee chair reports and our research into this vocabulary's history pinpoint an issue with the digital humanities conference vocabularies and their sustainability. The vocabulary was never officially adopted (as far as we can tell) nor was it appropriately maintained in a stable system. Program chairs often had to depend on the ConfTool system to transfer the vocabulary; changes were not documented in any official way and conference organizers could not see the different implementations of the vocabulary over the years. For instance, there was no spreadsheet with the previous years' list given to conference organizers: indeed, in researching this article, we note that there was not even a single way of saving or representing the list: we were able to unearth some lists in text files, none of which shared any organizing principles. Indeed, for some organizers, these are keywords or topics; for others, the controlled vocabulary is tied more to the function of the ConfTool system than a representation of the field. The inconsistent sharing and application of the vocabulary reflects that it was not valued as a means of knowledge production or organization: it was just something conference organizers had to figure out rather than a formalized document. In all likelihood, the early vocabularies were not thought of as formal data models, instead it was a by-product of the practical need to organize conference submissions. We are not arguing that the vocabulary should not change over years; but rather, we suggest that it should be clearly documented both for

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organizers and, as discussed below, conference participants and reviewers, in order to make its assumptions visible.

As ontologists remind us, there are multiple successful ways to document controlled vocabularies and their evolutions (such as thinking about classes, properties, and relations as a formal ontology does). The purpose of ontological documentation—and documentation of controlled vocabularies—is to render the logic of the data visible.[19] Without deploying formal ontological modeling, the data itself can be not only messy but also inoperable for users. For example, controlled vocabularies that do not distinguish between language of study and language of presentation will lead to an inability to appropriately assign reviewers with language competency who can read and evaluate a submission. Humanities data are messy; the way we categorize digital humanities is also messy and could benefit from more formal engagement with formal ontologies and data modeling. Improving digital humanities ConfTool vocabularies is not just about increasing the number of options available to choose, but rather, about fundamentally rethinking the structures of the field.[20]

2 Rethinking the DH controlled vocabulary

As we set about organizing DH2020, like many conference organizers before us, we revised the conference vocabulary.[21] An opportunity to rethink the entire vocabulary occurred: we received a completely empty installation of ConfTool with no data or structure predefined. As first-time DH conference organizers, we did not realize that the ConfTool should have been autopopulated with data including reviewer information and the previous year's vocabulary. With this blank slate before us, we set about imagining an organizational system for the conference from scratch. We asked the program committee chairs from DH2018, Ortega and Worthey, and were grateful when they shared their list of ConfTool topics and reports, which offered us a starting place. With our revised vocabulary, we sought to be inclusive of non-western periodization, gender and race, disciplinary fields, and methodologies.[22] Our goal was to better capture the ongoing work of digital humanities as it is currently being practiced around the globe. This was not our only motivation. English-language, North American, and Western European digital humanities have long dominated international conference opportunities (and opportunities at the international conference) both because of access to resources and also because their areas of scholarship were centralized by conference organizers and the conference itself. We recognize that these historical and systematic forces have limited access to the conference for those outside of North America and Europe and sought, in some small way, to intervene in this dynamic. Given the widespread interest in decolonization within humanities disciplines and of the academy, these types of small interventions can encourage larger approaches that truly alter scholarly dynamics and institutions. In short, revisiting controlled vocabularies is one part of moving toward scholarly equity, yet it must be coupled with additional economic and logistical solutions.[23]

For DH2020, rather than having geographical and chronological descriptors as part of the 'disciplines and fields' category, we separated out these areas into two new categories: geographical and temporal. This is to say, we disaggregated the vocabulary into classes so that everyone chose a geographic field (including 'Global' as an option) and also a temporal field. Although many scholars can define their work by national boundaries, others do not; furthermore, it would be impractical to have scholars choose from a list of all the countries in the world to identify their areas of expertise. As such, we opted for roughly continental geographical areas of focus. This would allow people to signal general areas of the globe. We also incorporated comparative and global as geographical categories so that those working across multiple geographies could represent their work. Previously, for instance, participants would pick 'Renaissance' or 'Medieval' from the 'disciplines and fields' category. The challenge, though, is that these terms reflect periodization terminology used by western institutions; they aren't as useful for scholars working in the same chronological areas outside of Europe and North America.

For DH2019, practitioners were only permitted to choose four disciplines and fields, including geographical and temporal focus. For DH2020, we widened the scope so that reviewers could choose more than that as their area of expertise. It is completely reasonable to have a scholar articulate six areas of expertise such as communication studies; feminist studies; education/pedagogy; disability and differently abled studies; film and cinema arts studies; and design studies. Another scholar might identify their expertise as history, literary studies, African-American History, global studies, and queer studies along with language and temporal categories.

The field of digital humanities is constantly changing and as such it is important to revisit the ontologies regularly, and to ask the ever-expanding reviewer pool to reselect their areas of expertise accordingly. For DH2020, we suggested submitters limit the description of their work to two 'disciplines and fields'—which would mean they focused on only the two most relevant fields, which would, in turn, help their submission be matched to the appropriate reviewers. While that

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suggestion was often exceeded, what we found was that the more alignment to the controlled vocabulary that the author could signal the easier it was to identify expert reviewers who could confidently engage with the submission. On the other hand, reviewers who selected dozens of areas of expertise diffused the effectiveness of the algorithm and so were sometimes problematically matched.

The other reason for reorganization of the controlled vocabulary is that some scholars' areas of work were omitted in previous years. In these cases, it was not simply a matter of having too many areas of expertise and having to choose your top field; rather, it was a matter of some areas of focus being deemed more valuable and work including than others. Terms like 'Renaissance' or 'Classical Studies' have a decided geographic connotation: they are used to describe Europe.[24] Indeed, a scholar working on the same time and place, 1590s England, could accurately call their time period the Renaissance, the Reformation, the early modern period, the Tudor age, or the Elizabethan era.[25] The connotation varies across these terms and accepted nomenclature varies across disciplines/programs and locations. This example is not uncommon: we could turn to another time and place and find just as many valid descriptors. What constitutes 'Renaissance Studies' or 'Classical Studies' is not something that holds across the globe depending on one's academic experience. Because ADHO is an international alliance, it is important not to privilege one geographical area or term over another.

Likewise, the previous uneven deployment of chronological and/or geographical categories meant that some fields of study were not represented at all. For instance, a scholar working on pre-seventeenth century Indigenous history or a Victorian literary scholar could not self-identify in the same way as a medievalist because they were not able to choose their chronological area of focus. Previous taxonomies privileged particular Western areas of study: 'Italian studies' was an option, but not 'Russian studies' or 'Japanese studies'. (This was in addition to the option of choosing Italian as language of presentation and review.) The weighted connotations of the terms we use to describe our fields of study can become invisible when we are so accustomed to them. While some might glance at the disciplines and think 'I'm a Classicist, my field is not represented', they can now choose 'BCE-4th Century' and 'Europe' and further refine their area by choosing 'archaeology' and/or 'art history', for instance. They can also provide keywords that complement their selections. Titles as well are particularly useful for signaling intersections with particular interests.

Our vocabularies were vetted by the program committee and announced prior to the submission period being open, and we made a few additions based on suggestions from the community. 'Performance Studies: Dance, Theatre' was one obvious oversight on our part and we were pleased to add it to the options in time for submitters and reviewers to select it. Likewise, we reintroduced 'Slavic Studies' at the behest of Dombrowski. This, and other additions based on community suggestions, improved the matching process.

Just as submitters chose terms from the controlled vocabulary to describe their submissions, reviewers selected the terms that best represented their areas of expertise. This year, the program committee did not have access to the previous answers reviewers had chosen about their expertise. As such, all reviewers were asked to update their areas of expertise, which also makes sense because of the revised vocabulary. Indeed, every year the conference chooses to update the vocabulary, it will require the pool of reviewers to revise and update their areas of expertise. While some reviewers were annoyed at the additional time the short survey took, most completed it easily.[26] Having reviewers revisit their areas of expertise (even, perhaps, just to confirm) also encourages reviewers to update their expertise based on interests and experiences that they may have gained in intervening years.

3 ConfTool and its algorithm

Once submitters described their submission(s) using the controlled vocabulary and reviewers selected their areas of expertise, ConfTool algorithmically assigned reviewers to submissions to review. For those unfamiliar with the ConfTool system, the underlying mechanics of the algorithm that handles automatic review assignments follows a set sequence of events (ConfTool, n.d.). First, conflicts of interests are identified by the system based on author names, affiliation, and the email suffix used when a reviewer created their account. This is then compared against the list of authors and co-authors on a given submission. This eliminates any instances of people who work at the same institution being asked to review one another's work—assuming the email used was an institutional email when registered. But, it does not account for other forms of collaboration that may result in a conflict of interest (e.g. one's advisor, graduate students, members of projects not mentioned in the submission who are outside the author's institution, etc.). It also does not capture colleagues who might have registered with a personal email. Given how common large, multi-institutional projects are, as well as collaborative work more generally in the digital humanities, the current automated conflict of interest process is insufficient. Thus, in DH2020, we reminded reviewers of the conflict of interest policy and also added more

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expansive definitions of conflict to account for areas of problem in the past.[27]

Moving forward from conflict of interest, the algorithm tries to identify the best reviewers for each paper—rather than the best paper for a reviewer—considering their identified areas of expertise *and* reviewers who have too few papers assigned to review in an effort to balance workload. The thresholds for the algorithm are pre-set during installation and customization of the ConfTool Review section. After determining how many vocabulary terms a submitter and reviewer may elect to assign to a submission or expertise, the program committee must also determine how many reviewers are needed to be assigned to review a submission. ADHO requires a minimum of three on every submission; however, with an unknown number of recusals due to conflicts of interests and/or reviewers who might fail to complete their assignments, our first task was to ballpark how many reviews we needed to solicit per submission. We heard from our colleagues handling DH2019 that there were significant numbers of reviews assigned but not completed. We were determined to assign six reviewers per submission to account for this attrition, hoping that we'd get at least a 50% response rate. Those who selected priority topics from the controlled vocabulary saw four to six submissions being assigned to them; this was because the algorithm had more preferences to work from. Those with too many areas of expertise (more than 12) or too few (fewer than 6) would only be assigned to one or two submissions, if at all.[28] These assignments were then largely a function of the procedural logic of the algorithm. The more areas of expertise reviewers had in common with submissions, the more likely they were to receive a higher number of review assignments; the fewer submissions in a given vocabulary term without reviewers with matching terms, the more likelihood that they might end up with reviewers who were not wholly familiar with their areas of study.

This algorithmic approach to reviewer matching is not without needed human intervention. ConfTool and its algorithm treat all controlled vocabulary categories as equal and unranked. While this allows for max matching of expertise, it severely impacts the ability of ConfTool to address multilingual submissions. The ConfTool algorithm is not able to limit assignments by language of submission, which meant that all non-English submissions had to have their reviewers assigned manually. Some submissions that were written in English were erroneously categorized as being in multiple languages, despite the instructions in ConfTool that the language category was for language of submission and presentation. Others were very clearly aligned to the language of presentation as the abstract, title, and keywords were received in languages other than English for non-English submissions.

Our major challenge beyond manual language assignment was that the ConfTool algorithm does not allow us to prioritize certain topics or areas of study. For instance, a submission about using Natural Language Processing to better understand French Enlightenment correspondence would have the tags 'Europe', '18th Century', and 'Natural Language Processing' (and perhaps 'French' as language of presentation). It might get matched to a reviewer with an expertise in eighteenth-century Europe who is not an expert on NLP, or, conversely, matched to a reviewer with expertise in NLP without expertise in pre-20th century literature and culture. We recognize that no single reviewer is likely to be able to review every single element of a submission, which is why we assign multiple reviewers to each. Controlled vocabularies mediated by ConfTool through its algorithm and its data processing directly structures how reviewers are matched to submissions, which affects how and who evaluates submissions.

On the positive side, we hope multiple reviewers provide a range of feedback that will cover different elements of each submission without requiring a 'unicorn' reviewer who masters both content and methods.[29] The fact that a reviewer assigned to a submission might not be able to evaluate every aspect of a submission could be seen as a problem; yet, we contend that this is a positive, not a negative. One of the reasons academic conferences are valuable is because they provide opportunities for feedback outside of one's immediate circle. The review process, in this way, is a beta test for the conference experience, where those attending a presentation or reading a poster will not be experts in that exact area. Furthermore, it is valuable for digital humanists and academics more broadly to communicate the importance and impact of their work to non-specialists or those in adjacent fields.

On the negative side, though, what this has meant in practice is quite uneven reviews where a submission may receive wide-ranging scores where content specialists rank a submission highly and a methodological specialist ranks the same submission quite low (or vice versa). One way we took steps to ameliorate this variation is to recognize that the algorithm might be too fuzzy for a reviewer's comfort level. A second intervention is the triangulation of reviews; by having multiple reviewers, the hope is that any imbalances in expertise and review assignments might be accounted for. Any reviewer can signal a conflict of interest at any point in the review process including that the wrong area of expertise has been assigned to a submission. A second intervention point to algorithmic insufficiency is allowing authors to respond to reviews to highlight areas of concern or disagreement with reviewers.

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Authors have a brief window of opportunity to clarify their original submission in light of reviewer comments. Author responses are taken into consideration along with the submission and review by the Program Committee who may elect to override a negative review and still accept a submission (or vice versa).

Additionally, as program chairs, we elected to override the automated assignment of reviewers on vocabulary terms which had seen problematic reviews and reviewer culture in the past. For example, we manually assigned submissions with the term 'Transgender and non-binary studies' to ensure inclusive reviewer culture. This, along with other areas of study including but not limited to African and African American Studies, Chicano/x and Latino/x Studies, Feminist Studies, and Decolonial Studies, have garnered *ad hominem* responses both in-person at the conference and also in the written word during the review process. For DH2020, to ensure that review culture remained respectful and, in recognition of the ongoing trauma these scholars have been subject to, we requested that ConfTool add the ability to 'hide' reviews from submitting authors, which led to a modification their developers undertook. 'Hiding reviews' meant that the program committee could see all reviews (including those who demonstrated a lack of collegiality) but racist or sexist reviews were not passed along to the authors. This was an intentional intervention not just because of the quality of the review but also because the algorithm would not allow us to weight the assignment of terms to ensure these areas received knowledgeable reviewers who would engage respectfully. It is not only our vocabularies that need to be updated to support our community, as this case demonstrates, it is how we deploy technologies to process them.

A final point regarding the algorithm and its function is that it relies on submitter and reviewer understanding of the terms included within the vocabulary *and* an understanding that some terms may overlap with one another. It could be tempting to continually expand a vocabulary or to use keywords instead of a closed list for categorizing conference presentations. For example, a project team who is submitting multiple contributions on the same project may vary its choices/keywords based on who the submitting author is. One author may select 'computer-assisted technology', another 'machine learning', still another 'artificial intelligence', and a final one 'natural language processing'. While we, as experts, know that these are all methodologically aligned, the algorithm is unable to reconcile these terms together when it comes to assignment. Thus, if a submitter selected 'natural language processing', it does not automatically also mean that a reviewer who selected 'machine learning' but not 'natural language processing' as their expertise will be assigned to this submission. This is a prime example of how digital affordances enable or limit how vocabularies are deployed. ConfTool does not leverage a semantic or deep data model for the vocabulary and its algorithm.[30] It is not a formal ontology.[31] The most perfect ontology (which might not exist in reality) will not be worth much for conference organizing if it cannot be processed. Indeed, people must be able to apply the ontology to their work and it must also be machine-usable.

The *Index of Digital Humanities Conferences* (Eichmann-Kalwara *et al.*, 2020), which brings together conference abstracts from nearly 500 conferences, clearly illustrate the challenges of overlapping terms when it comes to vocabularies and keywords. The *Index* includes both keyword tags and topics for indexed abstracts; both are optional (that is to say, not all abstracts in the *Index* have either keywords or topics). The *Index* notes that keywords are 'Optional keywords that are supplied by authors during submission'; whereas Topics are 'Optional topics from a conference-specific controlled vocabulary', which is what this article describes as a conference ontology. The *Index* currently has keyword entries for 'natural language processing'; 'natural language'; 'Natural Language Processing'; 'Natural language processing'; 'nlp'; 'NLP'; and 'NLTK' as well as an entry for 'natural language processing' in the separate 'topics' category. The papers with 'natural language processing' as a topic are not the same as those with 'natural language processing' as keywords, though there is some overlap; this is a function of some conferences using a controlled vocabulary (ontology) and others not. And these diverging practices assume the same phrase or descriptor is being used. While synonyms could be easy for an algorithm to process, one of the challenges for describing scholarship is that many of the terms we use are overlapping, but not entirely synonymous as the context associated with the application of the term matters. History, for instance, overlaps with archaeology and literary studies: a submission tagged with 'history' as a keyword might be appropriate for a literary scholar or an archaeologist to review, but not both. Furthermore, the connotations and meanings of terms change over time, and, as one of our anonymous reviewers pointed out, 'the divergence in usage patterns of different terms that mean the same (or close to the same) thing can also reflect everything ranging from terminology use among different sub-communities of practice, to author-based attempts to do what you did manually for disciplines that have gotten problematic responses, [for instance ,] deliberately not using 'computational text analysis' for papers where the methodology is 'simple' counting, on the assumption that reviewers who are used to working with more complex

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methods may be more likely to review it poorly'.[32] With synonymous, overlapping, and changing word meanings, even a 'stable' ontology is complex.[33]

4 Conclusion

No vocabulary, taxonomy, or ontology is perfect; algorithms are almost inevitably flawed. But with over 3,000 reviews to coordinate, these options are currently the best available. With community feedback and participation, we can improve these models. As this article demonstrates, we advocate for the ability to make intentional and careful changes to conference vocabularies including considering the adoption of a formal ontology. One reason to be conservative in conference vocabulary redesign is that using the same controlled vocabulary over many years could lead one point of consideration for longitudinal analysis. For instance, if a vocabulary remains stable, you could see the relative percent change in the number of submissions relating to each category, which would allow people to answer questions about trends in scholarship, such as 'is stylometry gaining or losing popularity as a digital humanities approach?'; a researcher would be able to look at both the number and percentage of submissions tagged with 'stylometry' in order to answer this question. If, however, a vocabulary is changed and one area of study is not included as a category one year, or if an existing category were divided into subcategories, it makes quantitative longitudinal research much more challenging.

The lack of consistency in the digital humanities conference vocabulary (and its lack of preservation both within and beyond ConfTool), to date, however, means that activist revision is both welcome and merited because it does not change long-standing practices in the field that could have otherwise been quantified. At this point, the digital humanities conference vocabularies could still productively be used for further research (were certain terms added or changed and how does that indicate changes in the field? Are some fields more readily rejected than others?); yet in order to make that future research possible it will be important to document our conference vocabularies and the rationale for making any changes.[34] There are a number of existing ontology library systems that could be used for '*storage*, *identification*, and *versioning*'; moving to a formal ontology might also support access and reuse (Ding and Fensel, 2001).

Further research on the development and deployment of vocabularies and ontologies in the international digital humanities conference will not only show the shape of a changing field of scholarship, but can also answer more granular research questions. Is the way we research digital humanities geographically inflected? That is, do researchers in Asia or North America have a preference for a given approach that is not reflected globally? How does a changing call for papers or outreach affect submission patterns? Does having a conference organizer from a cognate discipline encourage submissions in a particular area? How do reviewers change what areas of expertise they self-identify over the course of their careers? These questions, which focus on a singular conference, can be scaled to understand conference organizing across disciplines and geographies. And, as Bowker and Star (2000) point out, 'We have a moral and ethical agenda in our querying of these systems' (p. 5). One benefit of having a public-facing controlled vocabulary or formal ontology that is available to conference organizers, submitters, and later researchers is that the same ontology could be used or adapted by multiple conferences or publications. As we noted above, even within a single organization, the vocabulary could be passed down unevenly. We based the revised DH2020 vocabulary on the ACH2019 ontology (created by Jennifer Guiliano and Roopika Risam) and incorporated feedback from the community. The vocabulary that we created for DH2020 then served as the basis for the Association for Computers and Humanities (ACH) 2021 conference and the joint ACH-CSDH/SCHN (Canadian Society for Digital Humanities-Société Canadienne des Humanités Numériques) conference, DH Unbound 2022. We had published our vocabulary on the DH2020 website (Estill and Guiliano, 2019) and were pleased to be asked for it to be reused. Yet our public-facing vocabulary was (and still is) no more than a bullet-point list without even a permanent URL; improving the sharing and documentation of controlled vocabularies and conference ontologies could lead to more positive reuse, which could both lighten the burden on conference organizers and set the ground for further quantitative analysis across digital humanities conferences (using, perhaps, the *Index of Digital Humanities Conferences* as a strong starting point). We could learn from our colleagues working on Linked Open Data and data modeling about how to publish ontologies, vocabularies, and documentation.[35]

There are many future pathways for research when it comes to vocabularies, ontologies, and conferences, including considering adopting formal ontologies across digital humanities conferences. Digital humanities is well-known for being interdisciplinary: it could be fruitful to compare overlapping vocabulary terms with related conferences such as the annual Computers and Writing conference or the Museums and the Web conference. Researchers could also turn to large humanities conferences or symposia such as the American Historical Association or the Australian Academy of the Humanities to see where 'digital humanities' and its many subdisciplines fit in their conferences.

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Given the foundational importance of classification to conferences, and in particular, the international digital humanities conference, here we summarize the suggestions outlined in detail above:

- Controlled vocabularies should have documented origins and should be revisited regularly to ensure they adequately represent emerging scholarship and sub-disciplines; the logic and rationale of revisions should be preserved with the vocabulary itself.
- Conferences should clearly indicate how a vocabulary (or ontology) is being applied, including how it may intersect with technologies (like the ConfTool algorithm).
- Use Creative Commons or other appropriate licenses as well as a statement of 'how to cite this vocabulary' that credits the authors of the vocabulary including those who might have provided previous iterations.[36]
- Make any vocabularies, taxonomies, or ontologies public in advance of the deadline for submissions so that potential attendees can consider how their submission aligns to terms. Providing the documents in a shared format for comparison is one way to address this.
- Solicit feedback on the terms from the general public (as we did in 2020).
- For international conferences such as the annual ADHO event, it could be useful to consider multilingualism and how offering the terminology in different languages could welcome and encourage participation from non-English speakers.[37]

It has become commonplace to differentiate the philosophical definition of ontology ('state of being') with the computer science definition of ontology ('structured classification system'): yet, as this article demonstrates, how we categorize and classify also shapes how we understand the state of our field. The perennial question of what is digital humanities, and also how our own efforts to deploy controlled vocabularies within research and teaching have constrained certain types of research and the participation of individuals in those communities.

We've outlined the many reasons controlled vocabularies are important for structuring both the logic and logistics of conferences—and ultimately, the experience of conferences for participants. As one of our reviewers pointed out, critical analysis of vocabularies and categories also has implications for other academic systems including but not limited to: 'article review systems, grant review panels, and even tenure and promotion committees'. The way we categorize and classify our scholarship shapes and reflects the field. Any categorization can be exclusive or inclusive of marginalized scholars and new areas of scholarship. They serve as a mechanism for organizing submissions into panels and for participants to identify presentations of interest. With these interventions clearly identified, controlled vocabularies facilitate individual and communal engagement with the discipline—either through organizing current scholarship or by signaling potential future areas that might interest participants.

This article encourages further conversation among conference organizers about controlled vocabularies, ontologies, and their place within conferences. It also suggests the importance of inviting scholars to contribute to reviewing, developing, and deploying ontologies for digital humanities. Further analysis of how we name and connect our disciplines can only enrich our scholarship and represent its complexity and nuance more appropriately.

Notes

1. Eide and Smith Ore (2018) note the original meaning of the word 'ontology' comes from philosophy and has to do with the study of being, whereas 'In computer science and also in digital humanities', specifically, 'the term is often used as a near synonym to "data model," "thesaurus," and even to "closed vocabulary"' (p. 181). For thoughts on how to represent the changing meanings of words, like 'ontology', within an ontology, see Masolo (2019).
2. For more on the definitions of these terms, see Glushko (2016).
3. Within conference documentation like the Alliance of Digital Humanities Organizations' Conference Protocols, this controlled vocabulary has also been called keywords, topics, and terms.
4. There are, of course, too many individual ontologies for digital humanities projects to enumerate (or taxonomize!), but for an example of the breadth of digital humanities ontologies, see Common Lab Research Infrastructure for the Arts and Humanities (CLARIAH) (2019), Meroño-Peñuela (2020), as well as those discussed in Admundo (2019). For discussion of the analytic possibilities afforded by ontologies used in digital humanities projects, see Langmead (2016) and Zöllner-Weber (2009). Jansen (2019) suggests that 'ontology development in DH' should be 'a coordinated, principle-guided community effort'. The 'Ontologies for Digital Humanities' project (o4dh, http://o4dh.com) seeks to 'train Humanities experts in Semantic Web technologies and standards' and encourage the adoption and creation of ontologies for digital humanities research. Importantly, we note that ontology is its own expertise and deserves separate recognition. For example, readers might be interested in Doerr (2007) and Cifor and Rawson (2022).
5. See also Borek (2016).
6. For more on the TaDIRAH taxonomy, see Borek (2016), Borek (2017), and Dombrowski (2014).
7. See also Constantopoulos (2016).

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8. As Flanders and Jannidis (2018) point out, 'While the terms "data" and "modeling" may be new, many of the activities and intellectual frameworks they entail are familiar and deep-rooted' (p. 1); see their introductions to data modeling (both 'Data modeling in a digital humanities context: An introduction' and 'A Gentle Introduction to Data Modeling'). In Flanders and Jannidis (2018), Eide and Smith Ore's (2018) chapter focuses on how ontologies model humanities data in particular ways. See also Sperberg-McQueen (2004). For a theorization of classification with particular attention to gender and valuable digital examples, see Brown (2020).
9. We'd like to thank many previous DH conference organizers who helped us trace the history and application of ontologies for creating the annual DH conference. These former program committee chairs, local organizers, and conference coordinating committee chairs include Fabio Ciotto, Diane Jakacki, Bethany Nowviskie, John Nerbonne, Élika Ortega, Elena Pierazzo, Ray Siemens, Paul Spence, Melissa Terras, Manfred Thaller, John Unsworth, Deb Verhoeven, and Glen Worthey. We would also like to recognize the hours of unpaid labor that these folks and others undertook to create a successful conference each year.
10. Submitters and reviewers do not have the option to apply their own ontologies or add terms (this is a closed list), but to work within the existing system. However, in some instances, submitters have requested a term be added to the Conftool system and its ontology—see, for example, our discussion of the term 'Slavic Studies' further in the article.
11. We made the ontology and the uses of the ontology in conference organization public in a blog post on the DH2020 website; some of this information is adapted from that post. See Estill and Guiliano (2019). For more on interrogating technologies that we use to classify, see Bowker and Star (2000), especially Chap. 4.
12. Glushko *et al.* (2016) differentiate between categorization and classification: categorization is determining the different categories and their bounds; classification is assigning an item to a category or class. In the case of the controlled vocabularies used for the digital humanities conference, both categorization (design) and classification (selection) affect how the review process operates. See Glushko (2016), ed., 'Part VII. Categorization: Describing Resource Classes and Types' and 'Part VIII. Classification: Assigning Resources to Categories' for further details.
13. On the importance of transparency and conference organizing, see Estill *et al.* (2022) and Estill and Guiliano (2022).
14. For more on ADHO, see adho.org
15. We are grateful to the authors for sharing their report.
16. We are grateful to Manfred Thaller for sharing his report.
17. Conference organizers have to take into consideration the changing shape of humanities disciplines and aligned disciplines such as archaeology and library and information studies.
18. Thanks to Reto Speck for confirming these details shared by conference organizers. Thanks to all who racked their memories and searched their email and document archives to help us piece together the outlines of this ontology.
19. Most scholarship on ontologies underscores the importance of version control and documentation. For the importance of human-readable documentation, see Garijo and Poveda-Villalón (2020). An example of an excellent tool for developing formal ontologies collaboratively is Protégé (2016), which supports the latest OWL 2 Web Ontology Language and RDF specifications from the World Wide Web Consortium.
20. See, for example, discussions within the field of museology on the role of ontologies and disciplinarity including Moraitou (2019).
21. We are grateful for the input of the DH2020 Program Committee and digital humanities community in this process. The members of the DH2020 program committee were: Rahul K. Gairola, Hugh Craig, Anelise Hanson-Shrout, Angel David Nieves, Laura Mandell, Elli Mylonas, Alison Hedley, Bill Turkel, Karen Calteaux, Juan Steyn, James O'Sullivan, Elena Spadini, Aurélien Berra, Michael Sinatra, Tomoji Tabata, Taizo Yamada, Eloy Caloca, Ernesto Priani, Chao-Lin Liu, and Muh-Chyun Tang (https://dh2020.adho.org/about-the-event/program-committee/).
22. For an extended discussion on digital ontologies and western thought, see Drucker (2001). Readers might note that this division of topic, method, and chronology is also reflected in the US' Library of Congress (2022) subject headings.
23. See, for instance, Demeter (2020).
24. For more on how both classification and naming can be known to perpetuate or create biases, see Canning *et al.* (2022b), and, with a focus on Western-centrism, Hacıgüzeller *et al.* (2021). On how organizational logics apply to digital projects and their analysis, see Posner (2016).
25. For scholarship on the challenges and meanings of these overlapping terms, see Starn (2002) and Weber (2001).
26. Because we were not given access to reviewers' previously chosen areas of expertise, existing conference reviewers who didn't confirm their areas of expertise were sometimes assigned submissions without a knowledge of their expertise, which is not ideal, to say the least, and led to a number of review pairings being rejected by reviewer.
27. The conflict of interest policy we shared in ConfTool for DH2020 reviewers was as follows: 'A reviewer has a conflict of interest with a submission if the reviewer: has been a co-author, student or supervisor of one of the authors in the previous ten years; has contributed to or received material benefits from one of the authors in the previous five years; is employed at the same company or institution as an author, or has any other circumstances that could cause a bias in evaluating the paper'.
28. This ConfTool functionality is a problem for generalist scholars and is also something that could be considered by future conference organizers, who might choose to encourage reviewers to select only four to six topic areas. In considering the number of topic areas a scholar can choose, it will be important to balance a scholar's adequate self-representation with the functionality of ConfTool and its digital affordances.
29. See Estill *et al.* (2022) on the issue of including conference themes in review weighting.
30. The Library of Congress subject headings system, for instance, reconciles synonymous terms.
31. Indeed, the current controlled vocabularies applied to the conference do not offer definitions of the terms: the name offers the meaning without additional context.

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As Glushko *et al.* (2016) suggest, naming itself can be a way of describing something (see esp. Chap. 32, 'An Overview of Resource Description').

32. We'd like to thank our anonymous reviewer for signaling this possibility; it was one it had not considered.
33. For more on 'ontological stability', see Posner (2021).
34. The complete DH2020 controlled vocabulary was published online on the conference website (https://dh2020.adho.org/cfps/conference-ontologies/) for consultation during the submission and review process. After the conference, we submitted our ontology to Borealis, the Canadian Dataverse Repository, which is 'a bilingual, multi-disciplinary, secure, Canadian research data repository, supported by academic libraries and research institutions across Canada. Borealis supports discovery, management, sharing, and preservation of Canadian research data'. However, relying on individual conference organizers to preserve and share the ontology is not a systemic solution and does not encourage comparison across time and/or reuse and analysis.
35. On the importance of publishing documentation with ontologies, see Ding and Fensel (2001). Linked Infrastructure for Networked Cultural Scholarship (LINCS) offers a strong example of its rationale for selecting and using existing ontologies (quoted in full): 'LINCS will reuse existing ontologies and vocabularies where possible, building on existing linked data work and seeking out domain-specific vocabularies to incorporate and link in. It will look to the best practices established by large projects—such as Europeana, the Digital Public Library of America, and Linked Data for Production—and from cultural heritage providers in Canada who are experimenting with Linked Open Data. LINCS will work to ensure that its ontologies can represent non-hegemonic epistemologies and push alternative knowledge representations into the Semantic Web; as such, LINCS ontologies will be selected, adopted, and developed with an attention to intersectionality, multiplicity, and difference'. Available: https://lincsproject.ca/ontologies/. See Canning *et al.* (2022a) for more detail.
36. This recommendation aligns with other recommendations for transparency and preservation of conference materials published in Estill *et al.* (2022).
37. ADHO currently has five official languages, all of European origin: English, French, Spanish, German, and Italian. The Multi-Lingualism and Multi-Culturalism Committee is currently responsible for translating the annual calls for papers into these languages. For more on multilingualism as it relates to the international DH conference, see Estill *et al.* (2022).

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