

Open Access, Open Data, Open Software?

Proprietary Tools and Their Restrictions

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Open Science and the (Digital) Humanities

The goal of this article is to popularize Open Science principles and shed light on the role of Open Science in the research landscape of the humanities in general and Digital Humanities (DH) in particular. The commitment to Open Science is widespread among digital humanists but has not yet gained a similar foothold in the research culture of the humanities in general. Despite there being a lot of proprietary solutions offered for scholars conducting research with the aid of digital methods in the humanities, many digital humanists deem it important to choose only open formats to ensure as much inclusivity as possible (on various levels). It is my intention to make an argument for pushing the implementation of Open Science principles in the humanities and explain why it is crucial – even if it makes work more difficult sometimes. As Siemens suggests, I want to explore “the digital humanities’ positive role in the process of the humanities’ digital self-determination in the digital realm.”¹

At first the topics discussed in this article may seem to be disparate but I aim to show how they are interwoven and can benefit from and stimulate each other. Open Science principles, if taken seriously, determine the priorities in tool development and usage. As a result, aspects have to be taken into account that would otherwise not have been considered, and a different prioritization of tools and programs needs to come

¹ Siemens, Ray, Communities of practice, the methodological commons, and digital self-determination in the Humanities., in: Digital Studies/Le champ numérique (2016). <http://doi.org/10.16995/dscn.31>.

to effect.² However, the implementation of Open Science principles does not happen without stakeholders who actively advance and enforce them – the implementation of these principles largely depends on the relevance attributed to them by the respective fields and researchers. In my contribution, I want to illustrate how the frictions between Digital Humanities and the broader humanities can be utilized to come to a mutual understanding about the implementation of Open Science principles.

To discuss the topic of Open Science, I will draw on concepts of Open Access because this part of Open Science has already been widely discussed, and from there on broaden the subject to other elements of Open Science. Subsequently, I will link this to the relationship of the humanities and Digital Humanities and its potential for extending the practices of humanities research. Here I also want to point out the noteworthy role of funding agencies and universities in driving this development forward.

Why do we need Digital Humanities?

There is an ongoing discussion about what Digital Humanities is or should be. For this article I will operate with a minimal definition of Digital Humanities and beyond that only address those aspects of Digital Humanities that explain why so many digital humanists emphasize the importance of Open Science. “Digital humanities is a diverse and still emerging field that encompasses the practice of humanities research in and through information technology, and the exploration of how the humanities may evolve through their engagement with technology, media, and computational methods.”³ Although Digital Humanities is still a part of the humanities which is regarded with some suspicion and sometimes only understood as a service provider for research and for the application of tools, as Sahle remarks⁴, its

2 This can for example mean to weigh inclusivity and functionality against each other to negotiate if some cutbacks in seamless functioning are worth the enhanced inclusivity and access for other researchers.

3 *Svensson, Patrik*, The Landscape of Digital Humanities, in: *Digital Humanities Quarterly* 4 (2010). <http://digitalhumanities.org:8081/dhq/vol/4/1/000080/000080.html>.

4 *Sahle, Patrick*, Digital Humanities? Gibt's doch gar nicht!, in: Constanze Baum/Thomas Stäcker (eds.), *Grenzen und Möglichkeiten der Digital Humanities* (= Sonderband der Zeitschrift für digitale Geschichtswissenschaften, 1), 2015. https://doi.org/10.17175sb001_004.

resources can be used in a productive way to broaden the methodological (and intellectual) framework of the humanities as a whole.

Sahle points out that “[t]he Digital Humanities [...] are embedded in an extensive infrastructure in regard to organization, information, and communication and build upon long traditions in various areas of research. Furthermore, as a link between the humanities and computer science, the field seems to be highly attractive, not only to these areas, but also to neighboring disciplines as well as to the research funding agencies.”⁵

The problem remains that “[w]hen we do try to define [digital humanities] in a way that can lead to action, especially at a local level within an institutional structure, we tend to arrive at institutional- or discipline-specific definitions; these do have some sort of gain in that you can frame digital humanities in the terms of extant structures, but ultimately there’s a loss via disciplinarity’s constraint in light of current and future growth, narrowing potential collaborative opportunities and limiting the vision of what the intersection points between the humanities and digital could lead to.”⁶ Instead of focusing on disciplinary boundaries I want to direct the focus on a different aspect. Siemens shifts the discussion from questioning Digital Humanities to asking about the role of the humanities at large in the digital age: “How do the humanities fit in a digital age, reflecting and engaging not only its own traditions but, further, those of other disciplines implicated in, drawn in, partnered with, and fully incorporated and embraced by the methods utilized by the digital humanities. Does it do so by situating itself outside the humanities, outside of the very context that makes digital *humanities* different from other computational enterprises? I’d think not; I’d think we’d ideally work to situate it well within the humanities.”⁷

This changes the focus inasmuch as it implicitly asserts the necessity for the humanities at large to adjust to changing general conditions of doing research. To attune to the digital age and the changes it inevitably brings, the humanities should make use of the shared practices tested over generations and find a way to best transpose them into the digital realm. Digital Humanities can be of discipline-specific as well as infrastructural aid in the process of translation. One way to do so could be to look at the methodolog-

5 Ibid.

6 R. Siemens, *Communities of Practice*.

7 Ibid.

ical commonalities of the (digital) humanities in a sense that “[...] the notion of the community of practice here offers us a framework to consider and understand *who* we are via *what* it is we do, *where* we do what we do, and *why* we do it in the way that we do it. What is most unique about this frame is how it focuses us on the set of practices we share, who we share the practices with and where, on what we apply them, and to what end we do so.”⁸

This is crucial because it helps us reflect on what would be essential in developing new (software) tools and solutions to encompass shared practices of humanistic inquiry. It is important to keep in mind that software is not neutral, that the digitization is not neutral and that research cannot be transposed into the digital realm without repercussions we need to reflect on. “[E]ach stage in the digitization [...] has, among other things, semiotic, social, cultural and political implications.”⁹ As researchers in the humanities we need to reflect on those implications of the digitization from different vantage points but also keep our own desiderata in mind. We need to know the requirements of working with digital tools to figure out how to implement them into digital technologies. “If we are interested in creating in our work with digital technologies the subjective, inflected, and annotated processes central to humanistic inquiry, we must be committed to designing the digital systems and tools for our future work. Nothing less than the way we understand knowledge and our tasks as scholars are at stake. Software and hardware only put into effect the models structured into their design.”¹⁰ As Drucker describes, trying to put processes of humanistic research into practice in tool design requires the participation of those working in the fields of the humanities. Furthermore, trying to integrate Open Science principles into tool development and implementation brings about changes in emphasis. Different aspects of tools become important. The consideration of Open Science principles thereby leads to questions regarding fairness and inclusivity. I will discuss the entanglement of these topics, but first I need to lay the groundwork for this discussion by elaborating on the state of Open Science.

8 Ibid.

9 *Fiormonte, Domenico/Numero, Teresa/Tomasi, Francesca (eds.)*, *The Digital Humanist. A Critical Inquiry*, trans. by Desmond Schmidt with Christopher Ferguson, New York: Punctum Books 2015, 17.

10 *Drucker, Johanna*, Blind Spots: Humanists must plan their digital future, in: *The Chronicle of Higher Education* 55 (2009), B6-B8. <https://www.chronicle.com/article/Blind-Spots/9348>. [Paywalled]

Open Science, Open Access, Open Data

“Open Science is an umbrella term encompassing a multitude of assumptions about the future of knowledge creation and dissemination”, as Fecher and Friesecke point out.¹¹ As such, the term Open Science merges a diverse set of ideas and initiatives: Open Access and Open Data Initiatives, Open Scholarship or the demand for Open Educational Resources, Open Source Software, Open Review, Open Metrics, and demands for Open Methodology all get subsumed under Open Science. To define the idea behind Open Science more specifically, the definition of the Open Knowledge Foundation proves helpful and can serve as a minimal consensus: “Open means anyone can freely access, use, modify, and share for any purpose (subject, at most, to requirements that preserve provenance and openness).”¹² How this minimal consensus is put into practice in individual cases, differs quite drastically. The furthest implementation and greatest acceptance can be attributed to Open Access (OA). Therefore, I use OA as an example to point out the relevance of Open Science principles for the humanities as well as for our specific situation in a collaborative research center. Among the many positive features of Open Access are, for example, a higher visibility, free access for every user – regardless of the researchers’ affiliation –, better retrievability, and a faster dissemination of research results.¹³ The OA movement is described as having “[...] two different, alternative, converging histories: the history of the economics of recent academic journal publishing and the history of the free culture movement, which has its roots in the world of computer software.”¹⁴

11 Fecher, Benedikt/Friesike, Sascha, Open Science: One Term, Five Schools of Thought, in: Sönke Bartling/Sascha Friesike (eds.), *Opening Science. The Evolving Guide on How the Internet is Changing Research, Collaboration and Scholarly Publishing*, Cham: Springer Open 2014, 17.

12 Kleineberg, Michael/Kaden, Ben, Open Humanities? ExpertInnenmeinungen über Open Access in den Geisteswissenschaften, in: LIBREAS. Library Ideas 32 (2017), <https://libreas.eu/ausgabe32/kleineberg/>.

13 Arbeitsgruppe Open Access in der Allianz der deutschen Wissenschaftsorganisationen, *Open Access: Positionen, Prozesse, Perspektiven*, Bonn: Köllen Druck+Verlag GmbH, 2009, 3. <http://doi.org/10.2312/allianzoa.001>.

14 Eve, Martin Paul, *Open Access and the Humanities: Contexts, Controversies and the Future*, Cambridge: Cambridge University Press, 2014, 12. <https://doi.org/10.1017/CBO9781316161012>.

This might in part explain why the ideals of Open Science and Open Access are more widespread in the DH community than in the broader field of the humanities at the moment.

The debate about Open Access started in the 1990s, when the first influential commitments to Open Access were formulated by a bunch of initiatives, from the Budapest Open Access Initiative¹⁵ to the Bethesda Statement¹⁶ and the Berlin Declaration¹⁷ – to name just the most influential – , all drafted by different stakeholders but demanding similar policies and practices. Humanities scholars were involved in the formulation of all of these statements and hence have been part of the debate from the start.¹⁸ The Berlin Declaration, for example, was drafted at the end of a conference held by the Max-Planck-Society and the project European Cultural Heritage Online (ECHO) and signed by all big scientific organizations in Germany as well as several universities, academies and other research and cultural institutes.¹⁹

The Bethesda Statement formulates two criteria Open Access publications have to meet, which can also be found in the almost exact same wording – only minor details are added – in the Berlin Declaration:

“1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.

15 *Budapest Open Access Initiative*, Budapest Open Access Initiative, <https://www.budapestopenaccessinitiative.org/> [accessed: 17.05.2019].

16 *Suber, Peter et al.*, The Bethesda Statement on Open-Access Publishing, (Jun 20, 2003), <http://legacy.earlham.edu/~peters/fos/bethesda.htm> [accessed: 01.09.2019].

17 *Max-Planck-Gesellschaft*, Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (Oct 22, 2003), <https://openaccess.mpg.de/Berliner-Erklärung> [accessed: 01.09.2019].

18 *M. P. Eve*, Open Access and the Humanities, 24.

19 One of the aims of this conference was to think about web-based research environments and the future of scientific publishing online. The conference announcement is available at: *Max-Planck-Gesellschaft*, Berlin-Konferenzen, <https://openaccess.mpg.de/BerlinOA> [accessed: 09.05.2019].

2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving [...].”²⁰

From the beginning OA initiatives demanded, as I want to point out, a change in the practices of all stakeholders involved.

Though there also have been critical voices raising concerns about academic freedom²¹ and about different logics of publishing between the sciences and the humanities²² (some of whom I will reference later), there were a lot less counter-initiatives.²³

Alongside these first declarations there is a wide array of initiatives to make the case for a wider acceptance of Open Access in all parts of academia. In several countries state-led initiatives build regulatory foundations in various ways to fasten the implementation of Open Access. In Germany, the most important research funding agency, the Deutsche Forschungsgemeinschaft (DFG), expects researchers to publish their work Open Access if it is funded

20 P. Suber *et al.*, The Bethesda Statement.

21 The two biggest concerns regarding academic freedom are first that mandatory Open Access leaves no room to discuss what the role of academic labor is and whom its merits are granted to and second that it will restrict the authors' ability to say how, where, and by whom her work could be reused. See: *Columbia, David*, Marxism and Open Access in the Humanities: Turning Academic Labor Against Itself, in: *Workplace: A Journal for Academic Labor* 28 (2016), 74–114, esp. pp. 100–101.; *Anderson, Rick*, Open Access and Academic Freedom (Dec 15, 2015), <https://www.insidehighered.com/views/2015/12/15/mandatory-open-access-publishing-can-impair-academic-freedom-essay> [accessed: 31.08.2019].

22 Rosenzweig argues that scholarly societies play a big role in publishing in the humanities and that mandatory Open Access could threaten the societies and their journals because they need the money coming in through journal subscriptions. *Rosenzweig, Roy*, Should Historical Scholarship Be Free?, in: *Roy Rosenzweig, Clio wired: The Future of the Past in the Digital Age*, New York, NY: Columbia Univ. Press, 2011, 119–120.

23 The Heidelberger Appell is an example for an initiative spawn out of a humanities perspective: *Reuß, Roland*, Heidelberger Appell: Für Publikationsfreiheit und die Wahrung der Urheberrechte (Mar 22, 2009), <http://www.textkritik.de/urheberrecht/appell.pdf> [accessed: 01.09.2019].

by the DFG, a purposive policy was approved in 2006.²⁴ Similar principles were implemented for the whole of Europe through Horizon 2020 and will be adopted and amplified through its successor program Horizon Europe in line with “cOAlition S” and “Plan S”. Those plans were devised by Science Europe, an association of European research funding organizations,²⁵ together with the European Commission. Their mission is to accelerate “the transition to full and immediate Open Access to scientific publications”²⁶ to reach a Europe-wide mandatory implementation of OA for research funded by the EU. The Member States of the EU believe “that free access to all scientific publications from publicly funded research is a moral right of citizens” and in 2016 jointly “committed to achieve this goal by 2020.”²⁷ “Plan S” and “cOAlition S” mean an intensification of previous OA policies. Whereas under the regulations of Horizon 2020 green OA and even hybrid OA²⁸ met the requirements on Open Access publication, “Plan S” expects of research funders to “[...] mandate that access to research publications that are generated through research grants that they allocate, must be fully and immediately open and cannot be monetised in any way.”²⁹ This means that publication in hybrid form does not meet the proposed criteria. In an additional statement it is clarified that pre-prints “will satisfy open access requirements” but that “Article Processing Charges will be eligible for purely open access publishing venues (e. g. not ‘hybrid’ journals).”³⁰ Horizon Europe also intensifies the

24 *Deutsche Forschungsgemeinschaft*, FAQ: Open Access, (last modified Jan 10, 2017), https://www.dfg.de/foerderung/faq/open_access_faq/index.html [accessed: 01.09.2019].

25 *Science Europe*, About Us, <https://www.scienceeurope.org/> [accessed: 17.05.2019].

26 *European Commission*, ‘Plan S’ and ‘cOAlition S’ – Accelerating the transition to full and immediate Open Access to scientific publications (Sep 4, 2018), https://ec.europa.eu/commission/commissioners/2014-2019/moedas/announcements/plan-s-and-coalition-s-accelerating-transition-full-and-immediate-open-access-scientific_en [accessed: 01.09.2019].

27 *Ibid.*

28 Both terms will be explained on pp. 5–6. In short: Green OA means the permission of self-archiving whereas hybrid OA means publishing OA in an otherwise subscription-based journal.

29 *Science Europe*, Science Without Publication Paywalls. Preamble to: cOAlition S for the Realisation of Full and Immediate Open Access (Sep 2018), <https://www.scienceeurope.org/wp-content/uploads/2018/09/cOAlitionS.pdf> [accessed: 01.09.2019].

30 *European Commission*, Horizon Europe Impact Assessment. Staff Working Document 307, Part 2 of 3 (Jun 7, 2018), 106. https://ec.europa.eu/info/sites/info/files/swd_2018_307_f1_impact_assessment_en_v6_p2_977548.pdf [accessed: 01.09.2019].

regulations on research data as well as other research related output.³¹ Science Europe raises the pressure on researchers and publishers alike by stating that “our collective duty of care is for the science system as a whole, and researchers must realise that they are doing a gross disservice to the institution of science if they continue to report their outcomes in publications that will be locked behind paywalls. We also understand that researchers may be driven to do so by a misdirected reward system which puts emphasis on the wrong indicators (e. g., journal impact factor). We therefore commit to fundamentally revise the incentive and reward system of science [...]”³² This indicates that the goal of these programs is not only an extensive policy shift but a deep impact on today’s research landscape accompanied by and calling for a change in publication practices.

Furthermore, there are joint initiatives to establish nationwide license agreements with big publishers – the German initiative is called Projekt Deal³³ – to secure access to the whole portfolio of e-journals, especially subscription based journals, with the goal to establish better deals and to pressure big publishers into transitioning to OA and publishing all articles of all participating institutions Open Access.³⁴

Widening the scope of Open Access and ensuring a wider implementation of Open Science principles are guidelines that were developed for the treatment of research data. The FAIR Guiding principles for scientific data management, for example, consist of four cornerstones that should be con-

³¹ Ibid.

³² *Science Europe*, Science Without Publication Paywalls.

³³ *Projekt Deal*, Über DEAL, <https://www.projekt-deal.de/aktuelles/> [accessed: 17.05.2019].

³⁴ A lot is happening in this field right now. While Projekt DEAL established an agreement with Wiley in January, the University of California canceled its subscription to Elsevier in February after unsuccessful negotiations. As UC California is the largest public university system in America, a big impact was expected. Lastly, around Easter, Norway was the first country to strike a deal with Elsevier that allows access to all Elsevier publications and OA publication for Norwegian researchers for a two-year pilot phase. (See: *Projekt DEAL*, Veröffentlichung des Deal-Wiley Agreements, <https://www.projekt-deal.de/vertragsveroeffentlichung-des-deal-wiley-agreements/> [accessed: 17.05.2019]. Gaiind, Nisha, Huge US university cancels subscription with Elsevier, in: *Nature* 567 (2019), 15–16. <https://www.nature.com/articles/d41586-019-00758-x>. Elsevier, Norway and Elsevier agree on pilot national license for research access and publishing (Apr 23, 2019), <https://www.elsevier.com/about/press-releases/corporate/norway-and-elsevier-agree-on-pilot-national-licence-for-research-access-and-publishing> [accessed: 01.09.2019].

sidered: the organization of data should be executed in a way that data is Findable, Accessible, Interoperable, and Reusable.³⁵ These principles for data management are not crafted in a way to focus solely on human scholars but instead “[...] put specific emphasis on enhancing the ability of machines to automatically find and use the data [...]” and with the intention that “[...] the principles apply not only to ‘data’ in the conventional sense, but also to the algorithms, tools, and workflows that led to that data.”³⁶ Guidelines on how to store research data and make it accessible increasingly become part of regulatory efforts.

Other initiatives, like DORA, the San Francisco Declaration on Research Assessment, focus on other parts of Open Science – in this case on Open Metrics. The goal of DORA is to “improve the ways in which the output of scientific research is evaluated by funding agencies, academic institutions, and other parties.”³⁷ Their goal is to establish new forms of evaluating the quality of research output as alternatives to the flawed Journal Impact Factor.

For more information on the benefits of Free and Open Source Software (FOSS) see the article “From text to Data.”

Before I go on to explain different variants of OA, I need to elaborate further on the term “open” as such. Although I am a proponent of Open Science, I want to make clear that the notion of “open” that is taken up in Open Science principles is in no way unambiguous. As I mentioned earlier, the concept has its roots in movements evolving around computer culture and the free software movement. And this is where its ambiguity stems from. As Evgeny Morozov points out in an extensive essay, “[f]ew words in the English language pack as much ambiguity and sexiness as ‘open.’”³⁸ He goes on to elaborate that it was a process of active rebranding that led the free software movement to shift from “free” to “open”. “Profiting from the term’s ambiguity, O’Reilly and his collaborators likened the ‘openness’ of open source

35 *Wilkinson, Mark et al.*, The FAIR Guiding Principles for scientific data management and stewardship, in: *Scientific Data* 3 (2016): 1-9. <https://doi.org/10.1038/sdata.2016.18>.

36 *Ibid.*

37 *SFDORA*, San Francisco Declaration on Research Assessment, <https://sfdora.org/read/> [accessed: 20.05.2019].

38 *Morozov, Evgeny*, The Meme Hustler: Tim O’Reilly’s crazy talk, in: *The Baffler* 22 (2013), <http://thebaffler.com/salvos/the-meme-hustler> [accessed: 01.09.2019].

software to the ‘openness’ of the academic enterprise, markets, and free speech. ‘Open’ thus could mean virtually anything, from ‘open to intellectual exchange’ [...] to ‘open to competition’.”³⁹ This ambiguity also shows in the concept of and discussions around Open Access, making it difficult to fully embrace this concept without falling for its ambiguities.

Variants of Open Access

I want to elaborate very briefly on the different forms of Open Access. One differentiation is made between the so-called green OA and gold OA Standards. Green OA means that research is published in a subscription journal but the researcher retains the right to publish their work in a repository as a pre-print or after a set embargo period, whereas publications under gold standard are published OA right away. The costs of OA publications are normally shifted towards the side of the author in the form of article processing charges (APC)⁴⁰ – if APCs are charged at all. This can mean that the author has to pay for making OA available, but normally the cost for publication is eligible for funding – which is mostly explicitly stated by funding agencies.⁴¹ Journals can also decide to waive article fees if the author does not have funding.⁴² Another form of OA is hybrid OA, which means that research is published Open Access but in a subscription journal. This practice is highly controversial because it means that article processing charges are imposed for publishing OA while at the same time subscription fees are levied, a practice referred to as “double dipping”. Hybrid Journals are therefore not listed in the Directory of Open Access Journals (DOAJ), a directory indexing peer reviewed Open Access research journals and their metadata.⁴³ Introduced in 2013, diamond OA is a relatively recent form of OA publish-

39 Ibid.

40 The alternative term for this, “author processing fees” and variants thereof are misleading as Suber points out because the fees are rarely paid by the author herself since they are eligible for funding. P. Suber *et al.*, The Bethesda Statement, 138.

41 E. g., *Science Europe*, 10 Principles, <https://www.coalition-s.org/10-principles/> [accessed: 20.05.2019].

42 M. P. Eve, Open Access and the Humanities, 59.

43 *Directory of Open Access Journals*, FAQ: What is DOAJ, <https://doaj.org/faq#definition> [accessed: 20.05.2019].

ing.⁴⁴ It was defined as a reaction to the trend of gold OA becoming a business model, which the authors trace back to the taking over of the distinction of gold and green through Horizon 2020s research funding program.⁴⁵ They fear that this “[...] broad definition of gold OAs ideologically disguises the differences between for-profit and non-profit models and invites ideological abuse of this category by for-profit publishers [...]” which will in turn foster predatory Open Access Journals.⁴⁶ In contrast, “[i]n the *Diamond Open Access Model*, not-for-profit, non-commercial organizations, associations or networks publish material that is made available online in digital format, is free of charge for readers and authors and does not allow commercial and for-profit re-use.”⁴⁷ Using statistics provided by DOAJ, Fuchs and Sandoval point out that “[...] in September 2013, out of a total of 9891 journals listed in the DOAJ, 6527 (66.0%) had no article processing charges [...]” – with an especially low rate of APC-based journals in the humanities (between 2.3% in History and 28.1% in Business and Management).⁴⁸

All aforementioned variations of OA deal with venues of distribution. Another differentiation that primarily affects the user’s rights or freedom is made between gratis and libre OA. Gratis in this case means the removal of price barriers alone, while libre OA is defined as removing price barriers and a varying range of permission barriers. Suber transposed the terms gratis and libre from software development, where they are used to express the same distinction.⁴⁹ Both green and gold OA can be gratis as well as libre, but to obtain libre OA is usually easier for gold OA publications,⁵⁰ while diamond-OA is automatically libre. Authors who want to publish their work libre OA need to waive some of their copyrights. This is well regulated through open licenses, e.g., the Creative Commons licenses, which even allow for different gradients of usage approval, while publishing in subscription

44 Fuchs, Christian/Sandoval, Marisol, The Diamond Model of Open Access Publishing: Why Policy Makers, Scholars, Universities, Libraries, Labour Unions and the Publishing World Need to Take Non-Commercial, Non-Profit Open Access Serious, in: triple(C) 13 (2013), 428–443.

45 Ibid., 433.

46 Ibid., 436.

47 Ibid., 438.

48 Ibid., 434.

49 P. Suber et al., The Bethesda Statement, 65–66.

50 Ibid., 67.

journals mostly means completely waiving the copyrights of a publication in favor of the publisher. Creative Commons licensing “[...] leaves authors with permanent ownership of their work and lets them reprint that work without seeking permission or paying fees.”⁵¹ The different versions of Creative Commons offer different versions of rights clearance: “Creative Commons offers CC0 (CC-Zero) for copyright holders who want to assign their work to the public domain. The CC Attribution license (CC-BY) describes the least restrictive sort of libre OA after the public domain. It allows any use, provided the user attributes the work to the original author.”⁵² Then there are different versions of restricting CC-BY licenses: using CC-BY-NC⁵³ forbids commercial usage while CC-BY-ND⁵⁴ restricts editing, to name just the most known. The regulations made through “Plan S” make some kind of open licensing, preferably CC-BY mandatory.⁵⁵ This type of license has been criticized for restricting academic freedom because it “effectively assigns all of the exclusive prerogatives of the copyright holder to the general public, allowing anyone who so desires to copy, distribute, translate, create derivative works, etc., even for commercial purposes, as long as the author is given credit as creator of the original work”,⁵⁶ which is especially relevant in the humanities. Critics have also pointed out that it is “[...] wise to be cautious of the fact that the motivation of many governments pursuing open access is to allow industry to take the fruits of (often public) scientific research and to re-enclose it for commercial benefit.”⁵⁷ As I already mentioned, “Plan S” also forbids the monetization of research, but this policy only regulates the researcher. Still, these arguments can not be attributed

51 Anderson, *Talea/Squires, David*, Open Access and the Theological Imagination, in: *Digital Humanities Quarterly* 11 (2017), <http://www.digitalhumanities.org/dhq/vol/11/4/000340/000340.html>.

52 P. Suber et al., *The Bethesda Statement*, 69.

53 For more information check: *Creative Commons*, Attribution-NonCommercial 3.0 Germany (CC BY-NC 3.0 DE), <https://creativecommons.org/licenses/by-nc/3.0/de/deed.en> [accessed: 20.05.2019].

54 For more information check: *Creative Commons*, Attribution-NoDerivs 3.0 Germany (CC BY-ND 3.0 DE), <https://creativecommons.org/licenses/by-nd/3.0/de/deed.en> [accessed: 20.05.2019].

55 *Science Europe*, 10 Principles.

56 R. Anderson, *Open Access and Academic Freedom*.

57 M. P. Eve, *Open Access and the Humanities*, 23.

to the licensing itself and it is important to note that open licenses explicitly allow data mining and other forms of digital analysis while traditional publication forms normally do not – which is important for everyone wanting to conduct digital research.

Why Open Access?

Discussions on Open Access have gained momentum because of the so called “Journal crisis”, which worsened over the last 30 years. The subscription fees of natural science journals have risen and continue to rise because of the formation of large publishing houses through mergers, which led to a quasi-monopolization. At the same time, the measurement of the quality and importance of a journal through impact factors prevailed. A high impact factor means high reputation for the journal but also for every scientist publishing in it because “[t]he JIF, which measures journals’ average citations per article, is often incorrectly used to assess the impact of individual articles.”⁵⁸ It mostly also implies high publication and subscription fees.

This also had an impact on the humanities because the risen subscription fees left libraries with less money to buy monographs.⁵⁹ The severity of the problem became obvious for the broader public when Harvard’s Faculty Advisory Council signaled that the university’s library could no longer afford the rising cost of subscription fees. The council reported a price increase of about 145 % over the past six years, leading them to encourage the “[...] faculty to consider open access publishing as one means of alleviating the high cost of journal subscriptions.”⁶⁰ Anderson and Squires point to this as a key moment in the debate because firstly Harvard has the biggest budget of all American universities and secondly it generated publicity.⁶¹ The overall effect of the journal crisis is shown in various studies based on statistics from the

58 Priem, Jason, Altmetrics: A manifesto (October 26, 2010), <http://altmetrics.org/manifesto/> [accessed: 01.09.2019].

59 Hagner, Michael, #Open Access: Wie der akademische Kapitalismus die Wissenschaften verändert, in: *Geschichte der Gegenwart* (Sep 26, 2016), https://geschichtedergegenwart.ch/open_access-wie-der-akademische-kapitalismus-die-wissenschaften-veraendert/.

60 T. Anderson, Open Access and the Theological Imagination.

61 Ibid.

Association of Research Libraries. They show that subscription costs “[...] outstripped inflation by over 300 % since 1986.”⁶²

The effects on the humanities were profound: “From 1986 to 1997, the unit cost of serials rose 169 percent compared with 62 percent for book monographs. Research libraries’ expenditures for serials thus rose 142 percent compared with only 30 percent for monographs. In 1986 these libraries spent 44 percent of their budgets on books and 56 percent on journals; by 1997 the imbalance had grown to 28 percent for books and 72 percent for journals.”⁶³ Thus, the journal crisis was followed by a monograph crisis that is mostly felt in the humanities⁶⁴ because of the role monographs play in its research culture.

Problems of inclusivity

Another problem that arises for libraries when they subscribe to journals is that when they “[...] pay for subscriptions to digital journals, they don’t buy or own their own digital copies but merely rent or license them for a period of time. If they cancel a subscription, they could lose access to past issues. They could violate the publishers’ copyrights if they make or hold copies for long-term preservation without special permission or payment [...]”⁶⁵ This forces the libraries to carefully negotiate what is at stake in each individual case. I point that out because I see a similar model of dependency growing in the world of software that does not seem to be widely discussed until now. The subscription model of licensing is on the rise in software as well. The fee of software relevant for research processes is paid by the universities, and students and staff can use the programs. Software like *Citavi* has operated on this model for years but it also became more common for other programs formerly using models of perpetual licensing like the *Microsoft Office Suite* or *InDesign*. Also, a lot of proprietary programs in Digital Humanities or digi-

62 M. P. Eve, *Open Access and the Humanities*, 13.

63 McPherson, James M., *A Crisis in Scholarly Publishing*, in: *Perspectives on History* 57 (Oct 2003), <https://www.historians.org/publications-and-directories/perspectives-on-history/october-2003/a-crisis-in-scholarly-publishing>.

64 P. Suber et al., *The Bethesda Statement*, 33.

65 Ibid., 34.

tal social sciences operate on equivalent modes. This leads to new forms of exclusivity and exclusion not yet widely problematized by important stakeholders like universities or funding agencies. This university-wide licensing is normally limited to people having at least some affiliation with said university. Thus, universities demand Open Access while at the same time aggravating the problem of access through software licenses. The arguments raised for Open Access are also relevant for this case. Students and researchers get trained in using certain software they might no longer have access to once they leave university. Then they must choose between buying said software or searching for open source alternatives and learning anew how to use them. Training on open source software is still rarely provided at universities. The awareness of the importance of implementing FOSS at university level is still not fully developed but noticeably on the rise – mostly due to questions surrounding data security, protection and sovereignty. But although this problem should be tackled through open science policies and raising awareness, the focus, even of the DH community, seems to lie primarily on workflows instead of the broader implications: “More than causing personal frustration, this reliance on proprietary tools and formats has long-term negative implications for the academic community. In such an environment, journals must outsource typesetting, alienating authors from the material contexts of publication and adding further unnecessary barriers to the unfettered circulation of knowledge.”⁶⁶ The argument here is that the reliance on proprietary solutions for scholarly production makes it necessary to outsource parts of the publication process because the scholars cannot do them on their own. I would add that the problem is less the alienation than the business interests of other parties involved (as in the case of the journal crisis). Gil and Ortega add that “[t]he culture of ‘user friendly’ interfaces that has helped popularize computers for almost three decades now, and which underlines the dominant role of .docx, .pdf, and .epub files today, has also led to some basic misunderstandings of what computers can and should do. In the case of writing, the expectation that you should get what you see continues to distance producers from their tools. As with any human tool, we need to understand computers a bit more intimately if we’re going to use

66 Tenen, Dennis/Wythoff, Grant, Sustainable Authorship in Plain Text using Pandoc and Markdown, *The Programming Historian* (Mar 19, 2014), <https://doi.org/10.5281/zenodo.1477854>.

them with any degree of critical awareness [...]. [W]hat has remained invisible or grossly misunderstood to producers of scholarship in certain parts of the world are the material conditions of their own knowledge production – digital and analog – with noxious effects for labor and ecological practices.”⁶⁷ This argument points to the heart of the problem: Proprietary programs raise the expectation that software should do most of the work themselves and as seamless as possible. Compatibility problems that still often arise when working with FOSS solutions are attributed to the Open Source solution because all worked fine when not using open source – not considering that proprietary programs have a commercial interest in sustaining incompatibilities. The dependencies created by proprietary programs are linked to exclusion mechanisms created through incompatibilities. The problem of inclusivity is still only marginally addressed in the Digital Humanities but is slowly being popularized by DH initiatives like the minimal computing group of `go::dh`,⁶⁸ `transform DH`⁶⁹ or `Micro DH`.⁷⁰

It remains necessary to continuously raise awareness for the importance of the work that is done in tool development by on the one hand pointing out the restrictions proprietary programs impose on researchers – or sometimes even false assumptions about those programs⁷¹ – and on the other hand disclosing that there are issues of academic freedom and inclusivity involved in making oneself dependent on proprietary programs. Fiormonte,

67 Gil, Alex/Ortega, Élika, Global outlooks in digital humanities: Multilingual practices and minimal computing, in: Constance Crompton/Richard J. Lane/Ray Siemens, *Doing Digital Humanities: Practice, Training, Research*, London/New York: Routledge 2016, 30.

68 *GO::DH Minimal Computing working group*, About: What is Minimal Computing, <http://go-dh.github.io/mincomp/about/> [accessed: 20.05.2019].

69 *#transform DH*, About *#transform DH*, <https://transformdh.org/about-transformdh/> [accessed: 20.05.2019].

70 Risam, Roopika/Edwards, Susan, *Micro DH: Digital Humanities at the Small Scale*, in: *Digital Humanities 2017* (2017), <http://works.bepress.com/roopika-risam/27/> [accessed: 01.09.2019].

71 In a blog article Thomas Lumley for example responds to a twitter comment of an undisclosed poster complaining about R having no warranties. He responds by citing license agreements of popular proprietary solutions that also do not offer warranties relating to user errors, pointing to this assumption as “a clear symptom of not having read licence [sic] agreements for other statistical software.” Lumley, Thomas, *Absolutely no warranty?* (Feb 18, 2019), <https://notstatschat.rbind.io/2019/02/18/absolutely-no-warranty/> [accessed: 01.09.2019].

Numerico, and Tomasi argue “[...] that humanists need to engage in not only the development of online content but also with ethical issues around computing, especially issues around language, search engines, open access and censorship.”⁷²

Hence, in our collaboration we decided to use open source software and solutions wherever possible. As a result, we implemented open source software and tools whenever possible, for other workflows the conversion to open source would be too complicated at the moment because it would produce compatibility issues in a research environment that still mainly uses the Windows operating system. On the other hand, working with Linux based operating systems is in no way trivial. A lot of processes we are by now used to being automated in Windows have to be performed manually, which requires more technological expertise of all parties involved and cannot be implemented without additional training.

A lot needs to be done to raise awareness for the role of the individual researcher as well as universities as driving forces in either perpetuating the dependencies being fostered by using proprietary software or overcoming them. Regarding the implementation of Open Source Software we are still at the beginning. The Open Access movement has a pioneering role now but hopefully paves the way to generate acceptance for the necessary changes in research practices – even if it is more difficult at first. There is no denying that Open Source Software still does not run as smoothly as proprietary programs, but the example of Open Access shows how joint initiatives of important stakeholders can not only shift a discussion but also lead to important policy changes and redirections of money, which, in effect, leads to the emergence of new tools and solutions simplifying the process of OA publishing. Similar effects could be achieved by using the same mechanisms in implementing FOSS and other variants of Open Science. It is important to note that “[...] by making intelligent investments

72 Now this points to even broader aspects of the discussed problem: While I follow a line of argument that is fitted for a European context, problems of inclusivity and academic freedom have of course broader and much more serious implications that go beyond the scope of my article. A lot of those problems (from censorship to environmental issues to participation to reducing barriers of all sorts to working conditions) are addressed in the DH initiatives mentioned in Footnotes 67, 68, and 69. D. Fiormonte/T. Numerico/F. Tomasi (eds.), *The Digital Humanist.*, X.

in its information infrastructure, the academia could regain some of its autonomy.”⁷³

To achieve this, Open Science principles need to gain a bigger foothold in the overall research culture of the humanities. The Digital Humanities are well suited to be of aid here because there the relevance of the different aspects of Open Science shows regularly in daily endeavors. Therefore, I want to point to discussions on Digital Humanities and its role in the overall humanities research landscape to show how the frictions between both can be utilized not only to prepare the humanities for the demands of the digital age but also to use the critical potential of the humanities for overall changes in its research culture.

Frictions in research cultures as starting points for policy changes and metareflections

The research landscape of Digital Humanities differs in some relevant ways from the established research landscape in the humanities. In part this is due to the questions digital humanists are confronted with in their daily endeavors and the different approaches to the research objects prevalent in the Digital Humanities. “Examples of how and why ‘we’ have to play an active role in the design of the scholarly environments of the future abound in the experience of digital humanists – and are more common in the daily experience of scholars trying to perform basic research and writing tasks than many realize. [...] What version of a work should be digitized as representative of a work?”⁷⁴ Or translated into our context: What can be digitized without infringing copyrights? What data can be published? What is research data in the humanities? How can it be published? How can the context of the research be made visible – the material used, its enrichment, the methodology, the people working on making its enrichment possible? Questions that are not at the forefront of humanist thinking constitute the daily endeavors of digital humanists and lead to the recognition of friction points in digital humanities research.

73 Fecher, Benedikt/Wagner, Cert G., Open access or the re-conquest of autonomy, in: *encore* (2016), 79, <https://www.hiig.de/encore2016>.

74 J. Drucker, *Blind Spots*.

The importance of cooperation in Digital Humanities (and in Open Science Initiatives, for that matter) shows clearly that the transformation of research practices leads to the recognition of new voids and the development or adaption of new practices. I will illustrate this with three examples.

The metrics of attribution that are used up until now (and are criticized for various reasons⁷⁵) are not suited for assessing cooperative practices. It became important to find new ways of making the different roles involved in DH cooperations visible by, e. g., developing new ways of highlighting and making attributable the work of researchers involved in programming or maintaining digital research environments. Also, different forms of technology-enabled academic outreach prominent in DH like (micro-)blogging are not accounted for. Therefore, the striving for Open Access also includes new ways of impact measurement trying to depict forms of scientific inquiry that are not accounted for until now – and going a lot further than the DORA-principles. Open Access supporters argue “[...] the case for an alternative and faster impact measurement that includes other forms of publication and the social web coverage of a scientific contribution. The general credo is: As the scholarly workflow is [sic] migrates increasingly to the web, formerly hidden uses like reading, bookmarking, sharing, discussing, and rating are leaving traces online and offer a new basis by which to measure scientific impact. The umbrella term for these new impact measurements

75 And, as I want to add, valid reasons. I can not fully encapsulate the discussion but I try to give a very brief description of the main points of criticism: The Journal Impact Factor (JIF) that was originally meant to measure the impact of a journal is often used to derive the (presumed) impact of individual articles, which is in itself an invalid practice. This is in turn employed to assess objectifiable criteria that are used to evaluate the employability of individual researchers. This is a criticizable practice and even worsened by being built on misused parameters. While it is positive that because of new means of academic outreach new forms of impact assessment have been created that can supersede the old, flawed forms of impact measurement, this leaves aside the fundamental discussion on the problems of condensing academic work and impact into quantifiable aspects. For more information see: *Callaway, Ewen*, Beat it, impact factor! Publishing elite turns against controversial metric, in: *Nature* 535 (2016), 210–211. <https://doi.org/10.1038/nature.2016.20224>. *Fenner, Martin*, Altimetrics and Other Novel Measures for Scientific Impact, in: *Sönke Bartling/Sascha Friesike* (eds.), *Opening science: The evolving guide on how the internet is changing research, collaboration and scholarly publishing*, Cham: Springer Open, 2014, 179–189. *Lariviere, Vincent/Sugimoto, Cassidy R.*, The Journal Impact Factor: A brief history, critique, and discussion of adverse effects (Jan 26, 2018), <http://arxiv.org/pdf/1801.08992v2>.

is altmetrics.”⁷⁶ Altmetrics are also suitable to comply with other forms of Open Science that gained influence in recent years like Open Research Data or other forms of “raw science”. But they are only one part of the so called scientometrics, focusing on the web, interconnected tools, and social media as new sources for impact measurement. “Altmetrics can help researchers demonstrate the impact of their research, in particular if the research outputs are not journal articles, but datasets, software, etc., and if the impact is best demonstrated in metrics other than citations.”⁷⁷

Furthermore, as Niebisch points out, practices integral for software development and project management like agility⁷⁸ or versioning are more and more incorporated into the methodology of Digital Humanities because of the role of cooperative practices.⁷⁹ He compares the practices used in the development of digital objects to practices prevalent in philology, differentiating them into the role of versioning and the option of continuous development and points to the potential these practices can unfold in the humanities. He argues that the need for continuous development of software leads to the imperative of thorough documentation. This is what enables cooperative work on a project. Also, because software needs to be maintained and improved continuously, different versions of a program emerge over time. So software development does not create a static product but a historized and archived output. This can be compared to practices used in philology because in both cases texts are enriched by certain criteria. But whereas in philology the final product is a finished edition (at least up until now), in software development there is no final product but a continuous need for improvement – hence the need for versioning.⁸⁰ And through the change of practices facilitated by the Digital Humanities, these practices will take root in the humanities.

76 B. Fecher /S. Friesike, *Open Science: One Term, Five Schools of Thought*, 40.

77 M. Fenner, *Altmetrics and Other Novel Measures for Scientific Impact*, 183.

78 Agile software development is a diverse set of methods and practices developed to handle work in collaborative self-organizing and cross-functional teams.

79 Niebisch, Arndt, *Agilität, Versionierung und Open Source: Softwareentwicklung und Praktiken der Geisteswissenschaften*, in: *Wie Digitalität die Geisteswissenschaften verändert: Neue Forschungsgegenstände und Methoden* (=Sonderband der Zeitschrift für digitale Geisteswissenschaften) 3 (2018). https://doi.org/10.17175/SB003_009. http://www.zfdg.de/sb003_009.

80 Ibid.

Digital Humanities products are characterized by a collaborative structure that vehemently differs from the research methodologies in the humanities. This structure can potentially transform practices in the humanities. As Liu suggests “[...] the appropriate, unique contribution that the digital humanities can make to cultural criticism at the present time is to use the tools, paradigms, and concepts of digital technologies to help rethink the idea of instrumentality. [...] The goal is to rethink instrumentality so that it includes both humanistic and stem (science, technology engineering and mathematics) fields in a culturally broad, and not just narrowly purposive, ideal of service.”⁸¹ The humanities should utilize the critical attitude with which they approach their objects of research for a critical self-examination regarding their own methods and results. This would be a great starting point to evaluate which questions should be addressed and what would be important in tool development. Humanists should take a continuous part in tool development because they could ensure that the diverse iterations during the development contribute to advance the implementation of humanistic paradigms of knowledge and inquiry.

As a third example, the problems of attributing credentials especially for software development in the Digital Humanities spawned the development of principles for software citation. Laurence Anthony, whose tool AntConc was used in our collaboration, suggests forms of citation for the tools he develops on their websites.⁸² Besides, several other parties suggest a citation format, among these are the APA,⁸³ the software sustainability institute⁸⁴

81 Liu, Alan, Where is cultural criticism in the digital humanities?, in: Matthew K. Gold (ed.), *Debates in the digital humanities*, Minneapolis: University of Minnesota Press, 2012, 501–502.

82 Laurence Anthony suggests the following citation for AntConc: Anthony, L. (YEAR OF RELEASE). AntConc (Version VERSION NUMBER) [Computer Software]. Tokyo, Japan: Waseda University. Available from <http://www.laurenceanthony.net/software>.

83 See *Purdue University Online Writing Lab*, Reference List: Electronic Sources, https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/reference_list_electronic_sources.html [accessed: 21.05.2019].

84 *Software Sustainability Institute*, How to cite and describe the software you used in your research – top ten tips, by Mike Jackson (Jun 22, 2012), <https://www.software.ac.uk/blog/2016-10-07-how-cite-and-describe-software-you-used-your-research-top-ten-tips>.

and the FORCE11 group, whose principles for software citation were published in 2016.⁸⁵ In this instance, the humanities were not influenced by computational methods, but rather – via working on a way to incorporate principles of Open Science into the system of attributing credentials – yielded changes in practices of the computational sciences.

These are just a few examples to illustrate how the frictions between the research cultures of traditional humanities and Digital Humanities can be productive by initiating critical reflections on how the landscape of research could evolve. Liu sums up the point I want to make quite nicely when he states that

“[...] digital technology is on the threshold of making a fundamental difference in the humanities because it indeed serves as the vector that imports alien paradigms of knowledge. In terms of objects of inquiry, it brings into play whole new classes or levels of phenomena – e. g. quantitatively defined structures, forms, and cycles. In terms of analytical procedures, digital technology introduces modeling and other kinds of activities to complement interpretation. And in terms of the output or product of knowledge, digital technology expands the repertory of the monograph, essay, and talk (the staples of the humanities) to include programs, databases, visualizations, graphs, maps, etc.”⁸⁶

After having discussed the principles of Open Science with a specific focus on Open Access, the remainder of this text will focus on the role Digital Humanities could play in disseminating these principles across the broader culture of the humanities. The discourses and questions prevalent in Digital Humanities could be of aid when addressing the questions the humanities have to solve in order to adjust their research practices to the demands of the digital age. I will continue with describing aspects of how we tried to tackle these questions in our collaboration and how collaborative research centers in general can be a great facilitator in this process.

85 Smith, Arfon M./Katz, Daniel S./Niemeyer/Kyle E., Software citation principles, in: *PeerJ Computer Science* 2 (2016), e86. <https://doi.org/10.7717/peerj-cs.86>.

86 Liu, Alan, Digital Humanities and Academic Change, in: *English Language Notes* 47 (2009), 27.

Examples for the implementation of Open Science principles

The role of collaborative research centers in the humanities should not be underestimated because “[a]t their best, humanities centers and cross-disciplinary institutes are catalysts for humanities-wide perspectives and change.”⁸⁷ Woodward asserts that humanities centers “[...] have served as sites for innovation, as laboratories for incubating emerging modes of knowledge and investigating new objects of study in cross-disciplinary and interdisciplinary contexts.”⁸⁸ Liu claims that a big advantage of collaborative research centers is that they evolve intellectually around a shared topic.⁸⁹ This opens up new possibilities for discussion. As I already pointed out, one big opportunity of collaborative research centers seems to be the option of reciprocal stimulation of research cultures. To gain mutual understanding it is necessary to make explicit and verbalize aspects of research cultures that are assumed to be self-evident. There is great potential in this.

I do not have to explain much regarding our cooperation because Anna Maria Neubert’s contribution to this publication explains it in depth. I just want to sum up that we are part of a large collaborative research center that deals with questions surrounding aspects of practices of comparing, and our teams is responsible for bringing digital research and data management into the research alliance. The collaborative research center consists of eighteen subprojects. Six of them collaborate closely with us and contributed to this book. The projects were originally not designed to conduct digital research – planning how digital methods could be of aid in their research projects was part of the process of constituting our teamwork.

Before I outline which tools we chose to implement, I want to point out that, as is the case with Open Access, the sustainable implementation of open source software and other principles of Open Science needs the engagement of universities and other important research institutions and funding agencies. In some respects this seems to have gained momentum in recent years. The rectorate of Bielefeld University decided to regulate the

87 P. Svensson, *The Landscape of Digital Humanities*.

88 Woodward, *Kathleen*, *The Future of the Humanities – In the Present & in Public*, in: *Daedalus* 138 (2009): 113.

89 A. Liu, *Digital Humanities and Academic Change*, 22.

usage of at least some proprietary software on university computers⁹⁰ as well as the usage of cloud storage – especially in connection with sensitive data because of uncertainties in data sovereignty.⁹¹ In addition to that, the federal state of North Rhine-Westphalia was the first in Germany to roll out a cloud storage solution for universities and research institutes called *Sciebo*,⁹² which makes the data stored there subject to the German Federal Data Protection Act. A similar Europe-wide initiative is on its way in form of the European Open Science Cloud.⁹³ The next step forward for *Sciebo* is to extend its use cases by making it the basis for a new integrated solution for research data management and adding features that support collaborative work practices. In January of 2019, the universities of Münster, Bielefeld, and Duisburg-Essen started a joint venture financed by the DFG to achieve just that.⁹⁴ Again, there is a similar Europe-wide pilot initiative, the EC Open Research Data Pilot called OpenAIRE. It obliges projects it funds to develop (and keep updated) a Data Management Plan and to provide open access to research data, if possible.⁹⁵ Initiatives like that require the realignment of research data management practices and of programs facilitating the research process that are used on a daily basis. As pointed out before, this is something that is not yet conclusively resolved in the humanities. Research data management in the humanities begins with discussing what research data in the humanities could consist of. As part of our collaboration, we conducted workshops dedicated to this question,

90 *Universität Bielefeld*, IT-Sicherheitsrichtlinie zur Nutzung von Skype. Version 1.0 (Jun 21, 2012), http://www.uni-bielefeld.de/informationssicherheit/Regelungen/IT-Sicherheitsrichtlinie_Skype_2012-06-21.pdf [accessed: 01.09.2019].

91 *Universität Bielefeld*, IT-Sicherheitsrichtlinie zur Nutzung von Netzlaufwerken und Cloud-Speicher-Diensten. Version 1.0 (Nov 13, 2015), http://www.uni-bielefeld.de/informationssicherheit/Regelungen/IT-Sicherheitsrichtlinie_Cloud-Speicher_2015-11-17.pdf [accessed: 01.09.2019].

92 *Sciebo*, Das Projekt, <https://www.sciebo.de/projekt/index.html> [accessed: 13.03.2019].

93 *European Commission*, European Open Science Cloud (EOSC), <https://ec.europa.eu/research/openscience/index.cfm?pg=open-science-cloud> [accessed: 20.05.2019].

94 *Universität Bielefeld*, Blog: uni-intern (8 Jan 8, 2019), https://ekvv.uni-bielefeld.de/blog/uniintern/entry/geb%C3%Bcndelte_expertise_f%C3%Bcr_effizientes_forschungsdaten [accessed: 01.09.2019].

95 *OpenAIRE*, Factsheet H2020 Open Data Pilot, <https://www.openaire.eu/factsheet-h2020-odp> [accessed: 20.05.2019].

and Silke Schwandt held a keynote lecture on this question at a conference in Paderborn in 2018.⁹⁶

To make the matter even more complex, implementing principles of open data in the humanities is far from easy because most of its research objects are subject to copyright law, which is one of the reasons why Open Access receives such broad support in the DH community. Our solution is far from perfect because different tasks as of yet have to be accomplished on different platforms but it is a starting point we can build on since we are still at the beginning of our collaboration. We wanted to publish as much of the data we enriched as possible so we chose DKAN,⁹⁷ a free and open source data platform, to collect and publish the gathered research data. DKAN allows for the management of diverse data sets, which includes different gradients of accessibility rights – important in dealing with research data that cannot be published due to copyrights. So some of the data we uploaded will be open for the public, other data will only be accessible by the researcher working with it.

We decided to use Redmine for project management and documentation for the whole collaborative research center and initially used the already existing platform Sciebo to transfer files for further processing. We implemented a pipeline for digitization and natural language processing that is explained further in the article “From Text to Data.” The enriched data generated in this pipeline was then analyzed with several tools depending on the research questions. All of these tools are explained in the introduction to this volume and in Anna Maria Neubert’s article.

A remaining problem of product development within the contexts of Digital Humanities is that “[t]he user interface for many digital projects often seems developed as an afterthought, thrown together after completing the core functionality. However, a truly good user interface requires significant investment in design and development that needs to be integrated into

96 Schwandt, Silke, Quellen, Daten, Interpretationen: Heterogene Forschungsdaten und ihre Publikation als Herausforderung in der Geschichtswissenschaft, Paper presented at Forschungsdaten in der Geschichtswissenschaft, Jun, 7-8, 2018, Paderborn University, <https://kw.uni-paderborn.de/historisches-institut/zeitgeschichte/veranstaltungen/tagung-forschungsdaten/>.

97 DKAN, “DKAN Open Data Portal, <https://docs.getdkan.com/en/latest/> [accessed: 20.05.2019].

the project timeline and budget.”⁹⁸ It can be argued that until now Digital Humanities has neglected to think about interface design and the linked approachability. McGann points out that “[d]igital instruments are only as good as the interfaces by which we think through them.”⁹⁹ One unsolved problem that also showed in our cooperation is that tools become increasingly difficult to handle with growing functionality.

Therefore, humanists and digital humanists should join forces in the process of implementing and developing digital tools because “[t]he task of modeling an environment for scholarship (not just individual projects, but an environment, with a suite of tools for access, use, and research activity) is not a responsibility that can be offloaded onto libraries or technical staffs. [...] *The design of digital tools for scholarship is an intellectual responsibility, not a technical task.*”¹⁰⁰ This is not to be underestimated. “The scope of the task ahead is nothing short of modeling scholarly activity anew in digital media.”¹⁰¹ But if we are not involved in this process of “designing the working environments of our digital future, we will find ourselves in a future that doesn’t work, without the methods and materials essential to our undertakings.”¹⁰²

A finding that the survey of Gibbs and Owens points to is that humanists would be interested in tools that produce interesting results in a short time – an experience we also made in our cooperation. So perhaps “such rough and ready use should be a more explicit aim of digital humanities tool development. [...] [T]he fundamental barrier to wider adoption of digital tools seems to lie now in quality interfaces, accessible documentation and expectations management.”¹⁰³

We try to take this suggestion seriously for the next step of our collaboration, which will be the implementation of a Virtual Research Environment (all of it Open Source, of course).

98 Gibbs, Fred/Owens, Trevor, Building Better Digital Humanities Tools: Toward broader audiences and user-centered designs, in: Digital Humanities Quarterly 6, no. 2 (2012). <http://digitalhumanities.org/8081/dhq/vol/6/2/000136/000136.html>.

99 McGann, Jerome, *The Scholar’s Art: Literary Studies in a Managed World*, Chicago: Chicago University Press, 2006, 156–157. Cited after: Svennson, Patrick, Humanities Computing as Digital Humanities, in: Digital Humanities Quarterly 3 (2009), <http://www.digitalhumanities.org/dhq/vol/3/3/000065/000065.html>.

100 J. Drucker, Blind Spots.

101 Ibid.

102 Ibid.

103 F. Gibbs/T. Owens, Building Better Digital Humanities Tools.

Conclusion

Developing, broadening, and popularizing Open Science principles is one of the next big tasks the scientific community must address. The humanities in particular have to find their own tailor-made solutions for the specific requirements of the research processes in the humanities. I have discussed aspects that should be considered in this process of transforming research practices to meet the demands of the digital realm. The digital humanities community has pointed out the specific requirements. Their suggestions could serve as a good starting point for the necessary discussion. As I have shown by taking the example of Open Science, focal points in future tool development must be negotiated. These focal points will in turn determine which questions need to be addressed and which aspects of a tool will be important besides “mere” functionality. This works especially well in cooperative projects because of the option of mutual cross-pollination of research cultures. Furthermore, the discussions facilitated through interdisciplinary cooperations can make the needs of involved research cultures more explicit because they have to be verbalized for the sake of a mutual understanding.

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