BENTE MAEGAARD, RICCARDO POZZO, ALBERTO MELLONI, MATTHEW WOOLLARD (EDS.*), STAY TUNED TO THE FUTURE: IMPACT OF THE RESEARCH INFRASTRUCTURES FOR SOCIAL SCIENCES AND HUMANITIES*, LEO S. OLSCHKI, FIRENZE 2019 (LESSICO INTELLETTUALE EUROPEO, 128), XXXVI + 190 PP., ISBN: 9788822266439.

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The volume *Stay Tuned to the Future: Impact of the Research Infrastructures for Social Sciences and Humanities* collects the papers presented at the conference that took place in Bologna on 24–25 January 2018. The event was held in conjunction with the ESFRI (European Strategy Forum on Research Infrastructures) Working Group on Social Innovation (23 January) and aimed at investigating the impact of Research Infrastructures (RIs) for Social Sciences and Humanities (SSH). The papers assume, as Bente Maegaard and Riccardo Pozzo state (p. xxxv: « The landscape is taking a favourable shape »), that RIs will grow in importance and size in the future: the discussion about their impact, especially for SSH for which they are a relatively new phenomenon, turns out to be particularly urgent.[1]

In the documents of the European Commission presenting the strategy plan for 2020–2024, RIs are defined as « facilities that provide resources and services for research communities to conduct research and foster innovation ».[2] The Commission cooperates with EU countries to avoid duplication of efforts, reduce fragmentation « in the innovation ecosystem », and develop infrastructures that can be competitive on the international level.[3] The ESFRI is listed as the first initiative aimed at reaching these objectives. As its name indicates, the ESFRI is responsible for defining the long-term strategy and roadmap, monitoring ongoing projects, and impulsing new programs. ESFRI initiatives are distinguished in ESFRI

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[1] It is not the goal of the volume to question such assumption. However, as Ana Proykova mentions (p. 173), there is not a complete agreement on the matter, see for instance JORIS VAN ZUNDERT, « If You Build It, Will We Come? Large Scale Digital Infrastructures as a Dead End for Digital Humanities », *Historical Social Research / Historische Sozialforschung*, 37/3 (2012), p. 165–186.

[2] <https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/european-research-infrastructures_en> (Accessed December 2021).

[3] <https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/european-research-infrastructures_en> (Accessed December 2021).

projects and ESFRI landmarks: the first are « proposals of RIs with an adequate level of maturity », the second are « successfully implemented Ris ».[4] The roadmap 2021 features five landmarks and six projects for the SCI (Social and Cultural Innovation) area, that corresponds to SSH. The volume mainly discusses the landmarks, listed in the table below:[5]

Name	Full name	Operation Start (Y)
CESSDA ERIC	Consortium of European Social Science Data Archives	2013
CLARIN ERIC	Common Language Resources and Technology Infrastructure	2012
DARIAH ERIC	Digital Research Infrastructure for the Arts and Humanities	2019
ESS ERIC	European Social Survey	2013
SHARE ERIC	Survey of Health, Ageing and Retirement in Europe	2011

Table 1: List of SCI Research Infrastructures

CLARIN and DARIAH are the two RIs associated with the field of the Arts and Humanities, while the remaining three (CESSDA, ESS, SHARE) belong to the Social Sciences. The goals of each of these RIs are discussed in the fourth section of the volume.[6]

The general frame is set with two keynote papers. The following five chapters discuss each a different facet of the impact of RIs: « Conceptualisation of Impact », « Measurement of Impact and Research Infrastructures », « The Demand for SSH Research », « Social Science and Humanities ERICS and their Impact », « Increase of Impact through Interaction of Domains ». The main goal of the papers isn't to provide scientific studies on impact, nor fully innovative conceptualizations. Rather, these kinds of studies are here used as starting points for sharing doubts, expertise, best practices, global visions on the impact of RIs. Short bios of the contributors are included at the end of the volume (p. 175–180), where the readers can appreciate strong track records in managing and decision making, beyond excellent academic curricula. The concrete necessity of such discussions is clear:

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4   <http://roadmap2018.esfri.eu/projects-and-landmarks/> (Accessed December 2021)

5   The table is a section of the document found at <https://roadmap2021.esfri.eu/media/1290/ta bella-part-1.pdf> (Accessed December 2021).

6   A contextualisation of the emergence of the model of RIs and the implementation via the ERIC program, with a specific focus on DARIAH, is found in JENNIFER EDMOND, FRANK FISCHER, LAURENT ROMARY, TOMA TASOVAC, « Springing the Floor for a Different Kind of Dance: Building DARIAH as a Twenty-First-Century Research Infrastructure for the Arts and Humanities », in JENNIFER EDMOND, *Digital Technology and the Practices of Humanities Research*, Open Book Publishers, Cambridge 2020, p. 207–234, https://doi.org/10.11647/OBP.0192 (Accessed December 2021).

RIs are relatively new forms of organization for the domain of SSH. How can institutions, users, funders evaluate their output? This is relevant not only for designing an efficient funding policy, but also for improving the work and organization of RIs.

The contributions are divided into two main typologies: some concretely suggest parameters and pathways to assess and foster the impact of RIs for SSH, building on past experience, or on the ongoing work of similar organizations. The second group of papers takes a step back, questioning and trying to redefine the notion of impact for the Arts and the Humanities. This division roughly mirrors the distance between the two domains that here are assembled, the Social Sciences and the Humanities. Whereas for the former, the main challenge consists in finding reliable ways to correctly measure relatively well-defined factors, for the latter, an additional difficulty is given by the effort required for adapting the currently used metrics for research evaluation to the field of Humanities. This duality is somehow anticipated in Yves Gingras's highly informative paper, and emerges clearly in the fourth section of the volume.

In the first keynote paper, Žic Fuchs focuses on the notion of 'scientific excellence' and 'multidisciplinarity'. Current approaches bind the notion of excellence to scientific publications and patents, which results in measuring citations for the former and commercial value for the latter. However, such a definition is problematic for SSH in general and for RIs in particular, for which data curation and sharing represent a core business, whose impact is not easily assessed in terms of paper citations. According to Žic Fuchs, there is a general need for « conceptualising excellence in broader terms » (p. 5), not mimicking the methods used in other fields. On the second point, multidisciplinarity, Žic Fuchs states that RIs in SSH are especially suited for fostering multidisciplinary research, which appears to be a necessary feature of innovative research. These two lines (redefining excellence and fostering multidisciplinarity) come together in the consideration that the impact of RIs, and of the work of the scholars contributing to them, should be assessed taking into account precisely their contribution in creating multidisciplinary research. In the second paper, « The Specificity of the Social Sciences and Humanities and its Relation to Research Evaluation », Yves Gringas tackles specifically the 'perverse effects' of impact indicators, designed for natural sciences, on SSH research. The point discussed by Gingras is a very important one: descriptive bibliometrics show that research in the Arts and Humanities responds to very different trends than in Natural and (for some aspects) Social Sciences: single-authored papers, books, 'local' topics, and collaborations (vs international team-work) are much more frequent than in other fields. This is due to the different nature of the objects of study. Instead of forcing researchers to comply with evaluation standards modeled on different research communities, a much more reasonable approach would be to design evaluation

standards that are consistent with the current trends of the Arts and Humanities. Besides flawing evaluations, adopting the wrong indicators might also cause a decline in research quality because scholars would try to comply with these ill-defined standards by distorting their own working practices.

This first section has the merit of making very clear a crucial point: evaluation metrics need to be rethought for SSH, because they do not acknowledge the nature and practice of SSH research community, nor the specific challenges linked to the setup or RI. This is the ground on which all following sections implicitly build.

I. *Conceptualisation of Impact.* The first paper of this section, « The Impact of Big Data », by Elena Esposito, discusses assumptions that it would have been interesting to deepen here. RIs in SSH, generally constituted by databases, archives, software, are directly interested in the new challenges generated by the affluence of Big Data, as the diversity of the data and the difficulty in interpreting algorithms processing them. Since Big Data represent nowadays a major societal transformation, the impact of RIs dealing with them should be assessed taking into account their relevance for the society as a whole. Building on the comparison with Big Data analytics, which tends to be predictive more than explanatory, Esposito writes that RIs should consider their impact « on future developments rather than on past performance » (p. 30). The implications of this statement, however, are not fully developed: according to Esposito, we should give up the attempt of finding general criteria but rather prioritize flexibility for evaluation purposes. In the second paper, « Charting Impact Pathways of Investments in Research Infrastructures », Jelena Angelis, Elina Griniece, Silvia Vignetti, Alasdair Reid, describe the RI-PATHS project (2018–2020), whose aim is to develop a theoretical model describing the socio-economic impact of RIs given the large financial investments of public money they require. The model should conceptualize the causal mechanisms that link investments in RIs and the consequent impact of RIs. An extensive program of participatory workshops should ensure that such a model will be efficiently implemented and will benefit RI managers, policymakers, society, etc. It is worth mentioning that the project has indeed produced a handbook providing concrete guidelines implementing the plans described in this paper.[7]

This section acknowledges the difficulty in defining impact, but provides little guidance to the reader on how to reflect on this point: the first paper indeed, focusses on the very specific (and certainly pertinent) question of Big Data, and the second, given the early stage of the project described, provides generic directions but not yet fully formed reflections. However, the success of the RI-

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7   ELINA GRINIECE, JELENA ANGELIS, ALASDAIR REID, SILVIA VIGNETTI, JESSICA CATALANO, ANA HELMAN, MATIAS BARBERIS RAMI, HENNING KROLL, *RI-PATHS*, <https://doi.org/10.5281/zenodo.3950043> (Accessed December 2021)

PATHS project shows that this kind of initiative is a valid tool to tackle the questions asked here.

II. *Measurement of Impact of Research Infrastructures.* The first paper of this section, « UK Data Service: Impact-Driven Approach to Service Delivery » (Matthew Wollard, Victoria Moody) is a concrete description of how a well-established public service has been measuring its impact and how this measurement becomes part of a mechanism that funders can use for decision-making. After defining the functions of the service and the channels activated to enhance the impact profile of the UK Data Service, the authors describe concrete initiatives, tracking efforts, case studies and categorization systems to properly showcase its impact. The main take aways from this paper, as also stated by the authors, are two: (1) Evaluating impact, in non-quantitative but qualitative ways, is possible for RIs, but (2) this requires self-targeted strategies and long-term implementations. The experience discussed in this paper is certainly transferable to RIs for the Social Sciences, which act mainly as data providers. The link to impact measurement, conversely, is less clear for the second paper, by Riccardo Pozzo and Vania Virgili, « Innovation for Inclusion and Reflection ». Starting from the syntagma « Social and Cultural Innovation » used to discuss RIs connected with SSH, the authors introduce some of the key elements of Pozzo's philosophical approach,[8] namely the fact that contemporary societies need to be inclusive and reflective. By providing space for cultural innovation, RIs can foster inclusion as they provide access to resources and consequently can be considered as « common goods » (p. 67).[9] A reflective society is a society that, in a globalized world, can construct its identity through contact and enrichment. In the conclusion, the authors hint at the fact that the use of cell phones by migrants represents an entry point through for inclusion and reflection. Given the nature of the paper, it would have best complemented the texts presented in the first section of the volume. The third and last contribution, by Jean Moulin, has the title « Measurement of Impact of RIs: Use and Usefulness of Indicators » and reviews quantitative and qualitative indicators currently used for RIs. The contribution is based on the results of a survey conducted by the Expert Group of the Global Science Forum of the Organisation for Economic Co-operation and Development. First, criteria for establishing a typology of RIs are given; then the author distinguishes the different levels at which impact can take place (from local to « the whole European society », p. 73). Two main strategic objectives are given for RIs (scientific

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8   Some of the given definitions, contextualized in Pozzo's broader philosophy, can be found on the page: <https://en.wikipedia.org/wiki/Riccardo_Pozzo> (Accessed December 2021).

9   The statement in based on Pozzo's previous work, for instance R. Pozzo, V. Virgili, « Governing Cultural Diversity: Common Goods, Shared Experiences, Spaces for Exchanges », *Economia e Cultura,* 26/1 (2016), p. 41–47.

leadership and support for innovation), and six dimensions of impact assessment (from scientific output to indirect economic impact) are presented in detail. In the last part of his contribution, Moulin gives some practical suggestions on how to apply these categories to the SSH RIs.

The section is overall very informative, and, in a way, encouraging, showing that a large amount of work, both on the systematic level (as Moulin demonstrates) and in concrete cases (Wollard and Moody) has already been done and will certainly benefit SSH RIs. Nonetheless, Pozzo and Virgili remind us that, as to cultural impact, conceptualization efforts are still necessary before establishing any concrete practice and measurement: as announced, the duality between Social Sciences and Humanities emerges very clearly here.

III. *The Demand for SSH Research.* This section is constituted of three papers, each tackling the question of how SSH research makes use of RIs, or might need to make use of RIs. The first paper, « Austrian Institutions as User of Social Sciences and Humanities Research Infrastructures », by Matthias Reiter-Pázmándy and Thorsten D. Barth reports on two projects by the Austrian Federal Ministry of Education, Science and Research (BMBWF) aiming at mapping and fostering the use and visibility of RIs in Austria. The authors claim, among other things, that data for comparison, as, for instance, the number of users, should be collected for impact assessment purposes.[10] The first project aimed at analyzing the use of large, international, RIs by Austrian institutions from 2013 to 2018. The most striking results are that two SSH RIs appear among the four most used RIs in Austria, and, that, when looking at the twenty-four RIs for which the BMBWF holds a membership, the total number of institutions using SSH RIs is largely comparable to the other fields.[11] The second project describes the attempt of creating an Austrian public database of RIs for sharing information, giving visibility, and fostering transparency of RIs. The authors outline the strategy for identifying RIs and for convincing researchers to register them. The third paper of this section, titled « Impact or Fertility » (Alberto Melloni), traces the evolution of the term « impact », from the original, ballistic, meaning, to the current trivialized « impact syndrome » (p. 96) that strongly influences research policies in many countries. Melloni expresses his reservations about such an approach, pointing out two implicit assumptions of the impact model that might not apply to research and RIs. The first is « time », because the impact is measured during the active research career, and acts on the short time of decision making. The second postulate is that

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10 Counting users is a suggestion that emerges frequently in the volume. I find particularly interesting the statement by Romary and Edmond (p. 152–153) according to which the distinction between user and consumer does not really hold for the Arts and Humanities, the producers of data being generally the consumers as well: this increases the complexity of RIs dynamics.

11 49 for SCI, 61 for Physical Sciences and Engineering, 40 for Health and Food, 9 for the Environment.

we accept as valid the global ecosystem of research. Beyond that, for every positive impact, also a negative one should be assessed: resources and knowledge allocated for one RI might result in a decline of sectors that do not fit in the research agenda of the RIs. Hence Melloni suggests that « fertility » might be a better concept to exploit (p. 98), as it is turned to the long-term future and allows free blossoming of yet unforeseen or undervalued ideas. The last paper of this section, « Computers that Read and Understand (Almost): Language Technologies and Scientific Information Management », by David Pérez Fernández, Doaa Samy, Jerónimo Arenas-García, and Juan de Dios Llorenz González describes in general terms how texts can be mined using computer technologies. The authors hint at how these approaches can be used for supporting decision making, research policy etc., but do not go in-depth in analyzing any specific case that could demonstrate the utility of these technologies beyond academic research.

This section is very rich and heterogeneous, ranging from the conceptual paper of Melloni, to the concrete description of the Austrian current situation. Two important points emerge: the first is the large number of institutions subscribing to SSH RIs. This shows how compelling is the question of assessing their impact. The second point is Melloni's reflection about the 'negative impact': it is true that if we only reason in terms of concrete outcomes of RIs, we should consider carefully what fields are put in the background because of resource allocation to RIs. Reversing the perspective and looking and the generative aspect of RIs appears to me as a very appropriate metaphor, particularly suited, as I will discuss below, for the field of Digital Humanities.

IV. *Social Sciences and Humanities ERICs and Their Impact.* The fourth part of the volume is constituted of five papers, each dealing with one of the SSH ESFRI landmarks.[12] The first paper (« Impact of Social Science Data Services », by Ron Dekker), discusses the case of CESSDA, whose main goal is to promote the reuse of data for the Social Sciences. The analysis of the benefits is structured following the different stakeholders: service providers, researchers, research sponsors, and society. The diversity of the benefits described (from « scale effects » to « training ») is a clear anticipation of the difficulty of measuring the consequent impact (or « rate of success », p. 118) of CESSDA. The authors state in particular that there is a long and non-linear path between the intended goals and the effective impact obtained. The RI CLARIN is, in turn, presented by Franciska de Jong in the paper « CLARIN: Infrastructural Support for Impact through the Study of Language as Social and Cultural Data ». CLARIN provides access to digital language data, together with the tools needed for exploiting them. Its societal impact results from the data it preserves, which are keys for understanding « societal and cultural phenomena ». The data being multilingual, they are also

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12 See Table 1 above for the complete list.

well-suited for comparative studies and for capturing cultural diversity across Europe. CLARIN aims at playing a decisive role in the implementation of the FAIR principles for linguistic data publication,[13] while improving the transparency and documentation of the algorithms applied. An example of the benefits of such work is represented by the publication of parliamentary corpora. Rory Fitzgerald and Stefan Swift author the paper « Measuring the Impact of the European Social Survey ». The European Social Survey (ESS) is defined (p. 131) as a « pan-European RI providing freely accessible data for academics, policymakers, civil society and the wider public ». It organizes a survey every two years « measuring social attitudes and behavior ». In order to measure impact, the ESS keeps track of registered users and as a deposited bibliography of publications using ESS data. Moreover, Google Scholar was used as a source in a recent study for understanding in which research areas and journal publications make larger use of ESS data. To increase sustainability, the RI increases the number of its member states (SUSTAIN project) and monitors closely dissemination activities (Impact Monitoring Tool). The study of non-academic impact has shown that several government bodies base policy decisions on the ESS work. Axel Börsch-Supan, with the paper « The Socio-Economic Impact of the Survey of Health, Ageing and Retirement in Europe (SHARE) » examines the impact of the RIs (SHARE) whose main goal is to tackle the phenomenon of ageing and in particular its consequences on the economy, society, employment in Europe and Israel. Three types of impact are described: on research (increasing number of users and publications based on SHARE data), on policymaking (illustrated by examples), and on employment (measured in terms of researchers hired by the RI, and contracts given to external agencies). In the last paper of this section (« A Tangential View on Impact for the Arts and Humanities through the Lens of DARIAH-ERIC »), Laurent Romary and Jennifer Edmond address the problem of defining impact for an Arts and Humanities Infrastructure such as DARIAH. The Arts and Humanities studies use human artifacts to understand our societies and cultures. Their impact consists thus in creating an informed, critical and open citizenship. DARIAH provides researchers with the tools necessary for being well-informed about the impact of technology on the Arts and Humanities. The authors identify three main areas of impact (p. 153): « fostering research excellence » (through networking and training), « supporting organizational efficiency and effectiveness » (with a focus on Open Access), and « promoting more fluid interactions between policy and practice » (by facilitating the redistribution of data, expertise and training). In the conclusion, the authors indicate two areas (network creation and the promotion of innovation) where CLARIAH should work in going beyond the boundaries of its area of action.

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13 FAIR stands for Findability, Accessibility, Interoperability, and Reuse.

This section gives a practical shape to many points discussed in the previous parts of the volume by diving into the ongoing business of the discussed RIs. The section also displays very clearly the inherent differences between RIs for the Social Sciences and for the Humanities. ESS, SHARE and CESSDA are busy collecting and distributing data describing society: it is straightforward that the number of users, publications and decisions based on the data is a good indicator of the usability of these RIs. The situation for CLARIN and DARIAH appears more complex because both are involved with the transformation, on the level of sources, standards, and methods, of the way in which linguistic resources and human artifacts are gathered, preserved, conceptualized, and studied. This convincingly grounds the need for the change of perspective sketched by Esposito (thinking of the « future developments », p.30) and argued by Melloni (with the notion of « fertility », p. 98).

V. *Increase of Impact through Interaction of Domains.* The fifth and last part of the volume focuses on the interaction of domains and presents two papers. In the first (« Social Sciences, Humanities, and Exact Sciences: A Necessary Bridge to be Built »), Minh-Quang Tran suggests SSH and Exact Sciences (ES) should collaborate: SSH, for instance, should help in achieving a general social endorsement in the projects of fusion energy. However, the suggestion remains pretty vague (and, to my eyes, puts SSH in a position of servitude with respect to ES), despite the enthusiasm that emerges from the text. In the second paper (« Digital Infrastructures Interaction with Humanities Infrastructures »), Ana Proykova discusses at length the impact of digitization, in particular of the European Open Science Cloud (EOSC), to boost innovation in the Humanities.

The Specific Case of Digital Humanities and RIs

The volume has the merit of articulating, through the concrete problem of framing the complex work of RIs, several challenges that SSH research is facing nowadays. Narrowing down the discussion to the field of Humanities, I will develop some points emerging in the volume for which the existence of RIs plays a particularly important role in the domain of Digital Humanities (DH). This choice is motivated by the fact that both the Humanities RIs (CLARIN and DARIAH) focus on digital technologies[14].

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14 For the interaction, in the current research landscape, between the domains of Computational Linguistics (CLARIN) and Digital Humanities (DH) see Rachele Sprugnoli, Gabriella Pardelli, Federico Boschetti, Riccardo Del Gratta, « Un'Analisi Multidimensionale della Ricerca Italiana nel Campo delle Digital Humanities e della Linguistica Computazionale ». *Umanistica Digitale*, *3/*5 (2019), <https://doi.org/10.6092/issn.2532-8816/8581> (Accessed January 2022).

(a) *The function of the Humanities for the broader society.* Esposito, Gringas, Pozzo and Virgili, Melloni, Jong, Romary and Edmond, all raise the point very clearly. An answer that can be read in most of the papers is that Humanities research helps in better understanding our culture and thus improves the quality of societal relations. However, how this societal improvement should concretely take place is still not obvious. I think that a partial answer can be found in the observation by Reiter-Pázmándy and Barth (p. 87) according to whom non-academic institutions are also members of RIs. In the field of DH, GLAM institutions are the first natural non purely academic partners as they take care of the artifacts and heritage that are now undergoing digital transformation. Besides, they frequently take the lead in the digitization process. Models of collaboration between GLAM institutions and academia are currently studied and implemented,[15] and initiatives such as the data reuse charter[16] (described by Romary and Edmond, p. 155, as a shared initiative of DARIAH, CLARIN, and other actors) show that fostering these collaborations has high priority in DH working groups. Thus, the work related to digitization and digital exploitation of linguistics and cultural resources represents a realistic pathway to embed academic activities in the broader society: and RIs are concretely acting on this key process.

(b) *The need for training, trainers, and the role played by RIs in this respect.* This point clearly emerges in the description of the work of various RIs (see the papers by Dekker, De Jong, Romary and Edmond) and is especially central in the field of DH.[17] This links to the broader question of the skills required to future Humanities scholars and of the ongoing transformation of the research landscape. Recently, Barbara McGillivray and colleagues of the Alan Turing Institute[18] have claimed the need for a deep rethinking at the institutional level of the organization of Humanities research to concretely favor the hybridization with Data Science that

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15 See JESSICA WAGNER WEBSTER, « Digital Collaborations: A Survey Analysis of Digital Humanities Partnerships Between Librarians and Other Academics », *Digital Humanities Quartely,* 13/4 (2019), <http://www.digitalhumanities.org/dhq/vol/13/4/000441/000441.html> (Accessed January 2022), for a survey on the topic. A number of ongoing initiatives encourage collaborations, as the FED-tWIN belgian program (<https://www.belspo.be/belspo/research/FEDtWIN_en.stm>), going well beyond DH, or the recent Biblissima+ call for funding based on combined expertise of conservation and research teams (<https://www.irht.cnrs.fr/fr/actualites/premier-appel-manifestation-dinteret-biblissima-2021-2022>).

16 <https://datacharter.hypotheses.org/about> (Accessed December 2021).

17 Cf. JENNY OLTERSDORF, MARKUS MATONI, CARSTEN THIEL, *DARIAH Report on researchers' service needs.* DARIAH. 2016. <https://hal.archives-ouvertes.fr/hal-01351267> (Accessed December 2021).

18 BARBARA MCGILLIVRAY, BEATRICE ALEX, SARAH, GUYDA ARMSTRONG, DAVID BEAVAN, ARIANNA CIULA, GIOVANNI COLAVIZZA, JAMES CUMMINGS, DAVID DE ROURE, ADAM FARQUHAR SIMON HENGCHEN, ANOUK LANG, JAMES LOXLEY, EIRINI GOUDAROULI, FEDERICO NANNI, ANDREA NINI, JULIANNE NYHAN, NICOLA OSBORNE, THIERRY POIBEAU, MIA RIDGE, SONIA RANADE, JAMES SMITHIES, MELISSA TERRAS, ANDREAS VLACHIDIS, PIP WILLCOX . *The challenges and prospects of the intersection of humanities and data science: A White Paper from The Alan Turing Institute.* Figshare. <dx.doi.org/10.6084/m9.figshare.1273216> (Accessed January 2022).

is now necessary to properly exploit digitized material. Training is one of the aspects discussed (McGillivray et al. 2020 p. 20–21). Despite the need for a broader implementation of such multidisciplinary programs, DARIAH (with DARIAH teach and DARIAH campus)[19] and CLARIN (Teaching with CLARIN)[20] are at the forefront for providing open, online, reusable training material for researchers' self-training[21]. On this level as well, RIs are concretely acting on the most urgent challenges faced with the digital transformation of the Humanities.

(c) *Replacing the rhetoric of impact with the notion of fertility.* The problem is not limited to RIs, but in general to Humanities research. DH engages specifically with this point as it is based on interdisciplinary collaborations,[22] whose experiments are often seen as driving forces opening new avenues for research and « cross-fertilizing » (a frequently used term) domains. In addition, on the concrete level, DH projects may require computing power that is not immediately accessible to Humanities Scholars or GLAM institutions.[23] Tobias Blanke and Sheila Anderson suggest the metaphor of ecosystems, where habitats (computing services) host communities (domain research crowds) generating niches (applications and services).[24] RIs are ideally suited for giving life to this scenario: they are distributed, flexible, bring together technological facilities (as high computing platforms), expertise, research communities, and, as we have seen, GLAM institutions. They are also free from the disciplinary distinctions characterizing academic organizations. In this sense, RIs, that fulfill the call for generative power, play a key role in the future development of DH.

In conclusion, the volume, from the very specific perspective of understanding the impact of RIs, raises relevant points around which the debate is still open, especially in the current practice of Digital Humanities research and institutional organization.

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19 <https://teach.dariah.eu> and https://campus.dariah.eu/ (Accessed January 2022).

20 <https://www.clarin.eu/content/teaching-clarin> (Accessed January 2022).

21 Obviously many other equally valuable initiatives exist, as the well-known, multilingual and peer-reviewed https://programminghistorian.org/ (Accessed January 2022).

22 For a careful description of the DH field under this perspective, see MAX KEMMAN, « Boundary Practices of Digital HumanitiesCollaborations », *DH Benelux journali, 1* (2019), <https://journal.dhbenelux.org/journal/issues/001/Article-Kemman/kemman-main.tex.html> (Accessed January 2022).

23 Galleries, Libraries, Archives and Museums.
24 SHEILA ANDERS, TOBIAS BLANKE, « Taking the Long View: From e-Science Humanities to Humanities Digital Ecosystems », *Historical Social Research / Historische Sozialforschung*, 37/3 (2012), p. 147–164.