The Laboratory Turn: Exploring Discourses, Landscapes, and Models of Humanities Labs

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Abstract

The goal of this paper is to track the path of the formation of the laboratory turn in the humanities and understand the conditions, meanings, and functions of humanities labs. The first section investigates three discourses that gave rise to the emergence of a laboratory in the humanities: the transformation of the humanities infrastructure within the university, paradigm shifts in the social sciences, and the expansion of cultural categories of innovation, the maker movement (the proliferation of makerspaces), and the idea of community. Next, the author presents a history of the laboratory in the humanities and determines the shift from a *laboratory as a physical place to conceptual laboratory*. The last section analyses five models for humanities labs based on laboratories' statements and operations: the center-type lab, the techno-science lab, the work station-type lab, the social challenges-centric lab, and virtual lab. The research shows that the laboratory turn has emerged in the humanities as a part of a wider process of the *laboratorization* of social life, which has been occurring since the 1980s. Next, the study indicates the role of digital humanities as the driving force behind building a laboratory space, which supports situated practices, the collaborative, and technology-based projects. The paper shows that the humanities lab does not simply imitate the science lab but adapts this new infrastructure for its own purposes and needs.

Introduction

Owen Hannaway defined a science laboratory as a place that "involves observation and manipulation of nature by means of specialized instruments, techniques, and apparatuses that require manual skills as well as conceptual knowledge for their construction and deployment" [Hannaway 1986, 585]. A scientific laboratory implies a physical location, material instruments, equipment, and hands-on skills for knowledge production. With the proliferation and diversification of laboratories in city space, in cultural institutions (libraries and museums), in the virtual environment, and on the university campus, this definition seems difficult to maintain. One realization of labs that resists this elucidation is a humanities lab. A laboratory has emerged in the humanities as part of their rich infrastructure that includes a library and archive, the seminar and workshop, the classroom, the graduate program, the conference, the university press, the journal, the academic newsletter, etc. These all have been and remained institutional forms for the production of knowledge in the humanities. However, in recent years, we have observed how the present forms of infrastructure have been renamed "laboratories": a library's reading room at Yale University Library has been redesigned as the Franke Family Digital Humanities Laboratory, the University of Arizona College of Humanities has launched a new set of courses as the Humanities Lab, and research groups and seminars have been called a "laboratory", for instance, Representing Migration Humanities Lab in the English Department at Duke University. The humanities labs have been built upon different types of existing infrastructure giving rise to new forms of their realization and interpretation. They include situated and virtual digital humanities labs as well as non-digital, seminar- and project-based humanities labs.

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In this essay, I argue thus that the idea of a laboratory has been expanded and altered by social initiatives, such as library creative spaces, makerspaces, and hackathons. A laboratory goes beyond the notion of a physical place dedicated to scientific exploration, becoming, instead, a widely understood *project* (lab as concept, initiative, and

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program) focused on "labbing problems" (the approach to solve problems by applying the practices of labs; see more [Kieboom 2014]). Seen as a *project*, it insinuates that society is, in a certain sense, in a *projection state*, seeking new ways to tackle local and global challenges. The shift from a *laboratory as a physical location* to *conceptual laboratory* is thus crucial for the discussion of a new cultural paradigm. Referring to Thomas S. Kuhn's paradigm concept [Kuhn 1996], the laboratory turn entails fundamental changes in the practices and function of the humanities at large.

The purpose of this article is to track the path of the formation of the laboratory turn in the humanities and understand the conditions, meanings, and functions of humanities labs situated in North America, North-Western Europe, and Australia. In the first part of the article, I analyse briefly three discourses that gave rise to the emergence of a laboratory in the humanities: the transformation of the humanities infrastructure within the university, paradigm shifts in the social sciences, and the expansion of cultural categories of innovation, the maker movement, and the notion of community. Next, I present a history of the laboratory in the humanities and examine a wide range of application of the term "laboratory" to the humanities that cover institutional and technology-based labs (physical and virtual spaces engaging digital tools and technologies) and conceptual, non-digital labs (entities and projects that call themselves "labs" and don't have an explicitly digital component). Drawing on this analysis, I indicate five models for humanities labs based on laboratories' statements and operations: the center-type lab, the techno-science lab, the work station-type lab, the social challenges-centric lab, and virtual lab. These five types of laboratories grew out of various origins and discourses. The goal is thus to grasp the complex landscape of the humanities labs, comprehend their functions, and reflect on their development and features. The result section presents the main findings of the research related to the emergence of the laboratory turn, the uniqueness of the humanities labs, and the implications of labs for the positioning of the humanities both within and outside of academia.

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Three Discourses of the Laboratory Turn

Infrastructure Changes in the Humanities

By looking at the history of the humanities, we can discern moments of significant shifts occurring at the time of cultural, social, and economic changes. Each significant moment in the history of higher education — the beginning of the twentieth century, the 1960s/1970s, the 1980s/1990s, and 2007/2008 — is hailed as a transformation period for the humanities (see more about the history of university and humanities: e.g., [Bérubé et al. 1995] [Readings 1996] [Kerr 2001] [Klein 2005] [Donoghue 2008] [Gottschall 2008] [Kagan 2009] [Wissema 2009] [Collini 2012] [Bod 2013] [Jay 2014]). The discipline is seen as a reactive field seeking to adapt to new conditions and needs. One method which can be used to reimagine and strengthen the humanities is institutional change that entails new organizational structures and, alongside these structures, new research practices. Here, I outline briefly the infrastructural transformations which have been taking place in the U.S. since the 1980s/1990s. However, prior to doing so, it is worth recalling the most significant institutional change which occurred in the nineteenth century.

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At that time, the humanities were under the influence of the growing scientification of knowledge. The humanities were strongly engaged in precise and analytical research typical for scientific discourses. As Julie Thompson Klein describes it, "The tendency toward painstaking research and minute methodology became as evident in historiography as in science. The humanist's equivalent of the laboratory was analytic abstraction, reinforced by description, classification, comparison, and compilation. Like laboratory specimens, humanistic objects could be manipulated, dissected, and embalmed; measured, counted, and calibrated; and subjected to precise methodologies" [Klein 2005, 28]. In a certain metaphorical sense, the scientific laboratory was the first place in which humanistic research determined its methodology and infrastructure. At the beginning of the twentieth century, the university developed the modern system of disciplinarity, which consequently contributed to the independence of the humanities discipline. The moment of separation of the humanities from science meant that the humanities could shape the discipline's own methodology. This new independence of the humanities and the building of the discipline's own physical place became a key moment in the history of the humanities. Departing from a *laboratory methodology* was accompanied by moving from a metaphorical *laboratory* towards an office and a library: spaces that for a long time served as the main places for humanities research.

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Significant changes occurred in the 1980s as a result of the transformations in the academy. The phenomenon of mass universities, the weakening of disciplinary boundaries, and expanding globalization and corporatization led to a crisis in universities in the 1990s [e.g., Bérubé et al. 1995, Readings 1996]. This crisis rhetoric has started to penetrate any discussion about the university, which is attacked for its corporatization and ignoring social problems, as well as the state of the humanities, which is accused of being unprofitable and impractical. Under these conditions, the humanities were transforming gradually into an interdisciplinary field, engaged in sociological, political, cultural, and feminist discourses. The shift towards inter- and transdisciplinary practices and social engagement was accompanied by the symbolic gesture of moving the humanities "beyond the walls of the office" into the public domain. The humanities moved out of their usual spaces — the office and the library — into a new territory — the center — to intensify interdisciplinarity and public engagement. The implementation of new practices was thus reinforced by institutional changes. Consequently, since the 1980s, the humanities have established many centres, aiming to foster interdisciplinarity, build bridges with the medical, technical, and natural sciences, and create a common space for the university and the local community [Klein 2005, 76].

Next to the interdisciplinary research center, a new unit emerged with a focus on computing in the humanities. This center underpinned the development of humanities computing, renamed the digital humanities in the twentieth-first century. It played the role of a work station equipped with computers and other devices, gathering in the same place humanists, computer scientists, and programmers. However, the computing center was more than a physical work space; it was a significant ground for building new practices engaged in manipulating complex digital analysis tools and applying computing techniques. To advance computing within humanities practices, the discipline "required institutional investment in an entirely different infrastructure of courseware specialists, on a large scale and at an urgent pace" [Flanders et al. 2002, 379]. These infrastructural changes were necessary in order to express these new practices within the humanities and, along with that, the new function and place of the humanities in the larger institutional arena. Therefore, the center played an important role in restructuring the humanities within the university as well as reconceptualizing the field as a meeting place for interdisciplinary researchers and the local community.

The university entered the twenty-first century along with the accelerating power of technology, the emerging cyberinfrastructure, and intensifying globalization and internationalization. The university of the twenty-first century is an economically-driven institution centred on applied, profitable, and competitive research and training students in order to provide them with practical and useful skills. Based on J. G. Wissema's considerations of the third generation university, the academy of the twenty-first century is distinguished by seeking alternative funding for cutting-edge scientific research, intertwining the two worlds of academic and industrial research, operating in an internationally competitive market, and the commercialisation of knowledge [Wissema 2009, 31–2]. These technological, economic, and academic conditions have affected the humanities, which, particularly after 2007, entered a state of crisis. The humanities were seen as unproductive and out of touch with contemporary science and the technology culture, leading consequently to a decline in funding, reduction in the number of majors, and shrinking job market. Under these conditions, the humanities sought to find a strategy with which to reinforce their position. One of the implementations of the "tactical humanities" [Pawlicka 2017] is a "scientification of the humanities" [Stratilatis 2014], i.e., moving the humanities closer to the sciences [Gottschall 2008]. The process of the scientification of the humanities has taken different forms, including the use of new research data and applied methodologies (qualitative methods, data mining), new research practices (collaboration, experimentation), new methods of evaluating research (parameterization, falsifiability, the ranking system of universities), as well as reconceiving institutions (forming laboratories).

Consequently, the humanities took a step towards revamping their infrastructure, aimed at fostering and enhancing growing computational, collaborative, and interdisciplinary practices. In this light, drawing on Amy E. Earhart's reflections, a laboratory emerged in the humanities discipline as "more than a space, but a symbol of our hope" [Earhart 2015, 399]. It became a new institutional structure that was supposed to fuel the development of the humanities with new working models and research practices. The laboratory was intended to work as a driving force to develop a new model of the humanities based on collaboration, partnership, interdisciplinarity, situated practices, technology-focused work, and alternative, empirical education.

The laboratory idea was thus applied to the humanities field in response to its structural crisis; the existing infrastructure

(offices, library, seminars) was insufficient to meet contemporary scholars needs, such as advancing collaborative and interdisciplinary research and fostering frequent meetings and interaction [e.g., Hiatt 2005, Joselow 2016, Breithaupt 2017]. Therefore, a lab was not only seen as a new institutional unit for the humanities but also as a conceptual model for conducting research embedded and entailed in a laboratory's set of practices. In "Designing a Lab in the Humanities" [Breithaupt 2017], Fritz Breithaupt described his experience in creating the Experimental Humanities Lab at Indiana University, Bloomington in 2015, which arose from simple weekly meetings that the students called "lab meetings". "Sure, we had done several joint presentations and written some small articles, with more pending. But was this a lab?"; Breithaupt's striking question shows that firstly, the concept of the humanities lab is still far from a clear definition, and, secondly, that the lab idea grows out of the simple necessity of frequent meetings and conversations as well as the need to work together instead of remaining isolated in offices. The term "lab" is thus used to imply specific values embedded in a particular place or initiative. However, this tactical naming strategy doesn't necessarily transparently disclose the actual workings of knowledge production.

The impulse to establish laboratories in the humanities is also related strongly to the utilization of technology in research projects. Following the report of the American Council of Learned Societies Commission on Cyberinfrastructure for the Humanities and Social Sciences, "Our Cultural Commonwealth", we can see that physical laboratories have been established as a place for facilitating new research practices (collaboration, experimentation, and interdisciplinarity), advocating technological innovation, and developing a robust cyberinfrastructure [Our Cultural Commonwealth 2006, 29]. A laboratory entails physical situatedness, i.e., work is performed in a particular place and context. Traditional models of humanistic research involve work in an office, a library, or at home since it is not attached to place and does not demand any particular equipment and devices. In contrast to this model, digital humanities require equipment, tools, and software that are accumulated and provided, physically and through licenses, in one space. This place gathers people from different disciplines and institutions: programmers, engineers, librarians, curators, and archivists. It becomes a work space for collaborative, interdisciplinary, and technology-based research. Thus, humanities research has been transformed from placeless and isolated work into the collaborative and situated practices of the digital humanities. As a result, the digital humanities have become the driving force behind building a laboratory space. This new vision of the humanities propelled the creation of laboratories with missions related strongly to the idea of reconstructing the humanities in the vein of technological innovations. Good examples are the following statements made by digital humanities labs: "LINHD mission is to redefine the way of working in digital humanities by promoting innovation and technology in the environment of the new information society" [LINHD n.d.] by the Digital Humanities Innovation Lab (LINHD) established at the National University of Distance Education in 2014, and "We at the Price Lab believe that if the humanities are to survive and thrive, digital research tools for the imagined future of our various fields must be developed by scholars who possess expertise in both humanistic inquiry and digital technology" [Price Lab for Digital Humanities n.d.] by Price Lab for Digital Humanities launched at the University of Pennsylvania in 2015.

Therefore, along with the development of the digital humanities, we can track the infrastructural changes in the humanities of the twenty-first century as moving from a center [Zorich 2008] [Sample 2010] [Fraistat 2012] to a laboratory [Emerson et al. n.d.] [Svensson 2015] [Svensson 2016] [Svensson 2018] [Earhart 2015] [Lane 2017] [Pawlicka 2017] [Pawlicka-Deger n.d.] [Smithies et al. 2017] [Smithies et al. 2020] [Foka et al. 2018] [Pask 2018] [Ricaurte Quijano 2018]. The years after 2010 are particularly significant period in the history of the laboratory. First, we have experienced tremendous growth in numbers of labs launched in the academic and societal areas. Second, 2010 was proclaimed to be the year of "the death of the centre" [Sample 2010], which was now seen as an unsustainable place in which to house collective activities within the humanities. Third, in 2010, the Franklin Humanities Institute (FHI) at Duke University founded the Humanities Laboratories, heralded as a "new architecture of multiple humanities laboratories" [FHI-DU Humanities Labs n.d.]. This structure marked the beginning of a new model for a laboratory in the humanities as one that was created for a fixed period and a specific purpose, but which was not particularly related to physical situatedness and not necessarily involved a digital component. This model gave rise to *conceptual laboratories*, which were seen more as projects and programs entailing different types of learning and research practices in the humanities rather than physical work spaces. The good examples of conceptual labs are Humanities Labs at Colby College, which were launched as innovative courses in 2014 [Colby College Humanities Lab n.d.]. The notion of the laboratory is used in terms of new modes of research and community outreach which do not necessarily require a fixed

physical location and equipment. This significant change reflects the meaning of the laboratory turn: the lab does not refer to a physical place anymore; instead, it is related to a way of thinking, communicating, and working.

The last reason for the *laboratory boom* after 2010 is related to the growing interest in the concept of community, public engagement, and *do-it-yourself* culture. It entails popping out labs as makerspaces and hackathons in the academic space (e.g., the Curtin Library Makerspace at Curtin University) as well as establishing labs in city space; for instance, OpenLab was launched as a "challenge-driven innovation community" by Karolinska Institute, KTH Royal Institute of Technology, Stockholm University and Södertörn University in 2013 and located in the City of Stockholm [OpenLab n.d.].

Laboratory Studies and Conceptual Changes in the Social Sciences

The second discourse on the laboratory turn brings us back to the 1980s and 1990s when the conceptual shifts in the social sciences occurred. The new concepts had a significant impact on emerging new theories and the research approach of the twenty-first century. Based on Don Ihde's reflections, the following theoretical changes are indicated: the emergence of the new sociology of scientific knowledge, namely, social constructionism and the actor-network theory of the 1970s; the new philosophy of technology in the 1980s; and the concept of science as a cultural practice in the late 1980s and 1990s [Ihde 2009, 7]. This concise timeline reveals the most significant shifts in the notion of science, namely, moving away from science as a knowledge towards science as a practice [Pickering 1992]. As Hannaway claims: "Science no longer was simply a kind of knowledge (one possessed scientia); it increasingly became a form of activity (one did science). That there should have arisen in this period a place specially set aside for such activity and bearing a new name serves to measure the force of that shift" [Hannaway 1986, 586]. A new approach to thinking about science was based on a conviction that knowledge is produced as a part of social and cultural practices; therefore, scientific knowledge itself should be understood as a social product.

The perspective of science as a social practice opened up new questions regarding a place in which to construct science [Latour et al. 1979] [Galison et al. 1999], a community of practice [Wenger 1998], and material instruments and artefacts [Latour et al. 1979] [Lynch 1985] [Latour 1987]. It was a move towards unveiling scientific practices and investigating the network of actors that take part in constructing scientific knowledge, i.e., space, material instruments, technology, and community. By the late 1980s, there was no doubt that major changes were coming, driven by research in science and technology studies: *Laboratory Life* by Bruno Latour and Steve Woolgar (1979), *The Manufacture of Knowledge* by Karin Knorr Cetina (1981), *Art and Artifact in Laboratory Science* by Michael Lynch (1985), and *Science in Action* by Latour (1987).

Such a perspective on science entailed establishing new fields to explore the various aspects of the social construction of science. One area refers to a contextual theory of knowledge, assuming that the knowledge is situated in practice, in contrast to conceptual knowledge, which is abstracted from situations [Brown et al. 1989, 32]. This means, to put it slightly differently, that situated knowledge is a part of the activity, context, and culture in which it is constructed and used. Viewed in this way, space for knowledge production began to be one of the key research issues. Place defines the condition of scientific knowledge construction and determines the research mode and perspectives. Under these circumstances, laboratory studies arrived eventually as a new field focused on the investigation of the space used for scientific inquiry [Knorr Cetina 1995].

In this light, the emergence of the laboratory in the humanities entails a significant shift from the *text* towards the *place* where it is constructed. The laboratory draws attention to the space in which humanities experiments are conducted, the knowledge is produced, and scholarly communication occurs. Consequently, the humanities are seen as a *practice* and *process* that engages space, interactions, and equipment. Like the natural sciences and techno-science, the humanities involve "infrastructural thinking" [Svensson 2015, 337], according to which the architecture of the humanistic inquiry determines the process of knowledge construction.

The 1980s and 1990s, as Robert E. Kohler observed astutely, were thus recognized as a productive time for laboratory studies, and the laboratory itself was seen as a social institution. After that time, the notion of the laboratory was neglected until interest was revived again in the twenty-first century [Kohler 2008, 761]. Kohler's article "Lab History"

from 2008 is a significant gesture, implying that there was a surge in lab activity again after 2007 and a need for tracking its history. In this context, it is worth recalling another important publication, namely, *Representation in Scientific Practice. Revisited* [Coopmans et al. 2014], a revised book originally published in 1990. The manuscript suggests that research topics come back again after twenty-four years. One key issue it addresses is a return to the idea of laboratory, which, as the editors note, "extends to other spaces and places via collaborative ventures, shared data centers, and information and communication technologies", challenging "the very distinction between laboratory and field" [Coopmans et al. 2014, 1]. Both publications draw a connection between the study of scientific laboratories in the 1980s and laboratories of the twenty-first century, which have popped out in the humanities, social sciences, and outside of the university.

Cultural Categories: Innovation, the Maker Movement, and Community

The last line of development of the laboratory turn runs through the prevailing cultural categories of the twenty-first century. Let us now take a look at the following three cultural discourses and their impacts on changes within the university and humanities. The first category of innovation has dominated cultural and social rhetoric and given rise to new concepts, such as the innovation society and innovation paradigm. According to this rhetoric, to tackle the complex social, cultural, and economic problems of the twenty-first century, society must turn into an innovation society, which drives breakthrough solutions and cutting-edge technologies. Such discourse has led to the design of the manifold varieties of innovations labs that have popped up like mushrooms within the university and city space as social institutions; for instance, the Scholarly Innovation Lab (SIL) at the UCLA library and the Digital Innovation Lab at the University of North Carolina at Chapel Hill. The innovation concept has begun to be a crucial category defining the humanities labs and signifying the new features found within these labs, including a strong link between the humanities and the creative industries, providing cutting-edge equipment for excellent research, and solving hard problems. As a result of this discourse, the concept of an innovative university emerged with the desire to turn the university into a successful and competitive business or entrepreneurial university [Thorp et al. 2010].

The innovation approach requires effective creative ideas and thinking outside the box. Creativity is seen as a key method with which to improve social and economic conditions and "devise potentially better options for the future" [Moran 2010, 76]. A societal awareness of the value of creativity is constructed by establishing *creative spaces* that integrate the local community around the processes of creative endeavours. One such place is a library creative space that "focuses wholly or in part on content creation as opposed to content consumption alone" [Johnson 2016, 4]. The process of creation can include drawings and photographs, audio materials, videos, three-dimensional objects, computer coding, web-based multimedia, and more. Hence, library creative spaces play a key role in expanding the function of the library from providing information resources and services to integrating and developing the community through creative activities. One realization of these creative spaces is the advent of a laboratory in the common space that is the library. A laboratory in the library offers space, equipment, and resources and guides learning how to use digital tools and create digital projects [Goodman 2014] [Hamilton et al. 2015] [Johnson 2016] [Kavanagh Webb 2018].

Another type of creative space is the makerspace defined as a "center or workspace where like-minded people get together to make things" [Hatch 2013, 13]. The concept of makerspace is particularly related to a creative and participatory culture. It was conceived of as an outgrowth of the cultural *maker movement*, created as a "return to craft", in which people can build things together again [Proske 2013]. Therefore, coming back to the idea of *making things* came about as a response to consumption and corporate culture, driving interest in hacker and *do-it-yourself* cultures. Labcraft, using Hendrik Tiesinga and Remko Berkhout's term [Tiesinga et al. 2014], is thus seen as an innovative and, above all, community lab, seeking to connect people, create a space for dialogue, and transfer ideas to the world. Such labs aim to create new solutions and develop new ways of seeing the world. The maker movement has been embodied by the rise of media labs, established as institutionalized units (the academic media labs), cultural events (media lab workshops), and alternative models of education based on tinkering and hacking. Eventually, the *do-it-yourself* approach made inroads into academic culture through the launch of makerspaces (e.g., Maker Lab in the Humanities at the University of Victoria) and hackerspaces (e.g., Blow Things Up at the University of Colorado, Boulder) and organizing hackathons (e.g., in the Computational Humanities Lab at the University of Wisconsin–Madison).

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The last cultural category, which has accompanied the maker movement, is community. The labcraft, makerspace, and hackathon movements are all based on the idea of the community being the main resource and driving force behind them. The idea of the community, introduced in the 1990s [Wenger 1998], gained importance again in the twenty-first century, along with the concepts of civic engagement, activism, and the public humanities. Community and public engagement began to be common categories used to describe media and humanities labs. For instance, the Scholars' Lab at the University of Virginia Library is described as a community lab with the following motto: "We build up people and practices more than products." The lab prioritizes the process of learning and working together: "'People over projects' means that we care more about such outcomes, than about whether a formal 'project' happens" [Scholars' Lab n.d.]. The Change Making Media Lab at the University of Southern California, in turn, is a good example of public engagement in that it collaborates with people outside of the academy and creates products, such as entertaining dramas, that have real impacts on the local community.

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Cultural trends and a circulation of particular concepts are reflected in the emergence of different types of academic institutions, ranging from the entrepreneurial to the engaged university. To meet contemporary challenges, the humanities have made an "infrastructural turn" [Rockwell 2010] to build a physical place that, through the architecture itself, brings new features to the field: innovation, experimentation, hands-on practices, and collaboration. Under such circumstances, humanities labs have been constructed.

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A Brief History of the Laboratory in the Humanities

The first laboratories serving other than natural sciences were computer science labs established in media studies in the 1980s and 1990s; for instance, the Laboratory Paragraphe at the University of Paris 8 in 1983, Media Lab at MIT in 1985, and Aalto Media Lab at Aalto University in 1993. Media labs were launched as production, dynamic, and experimental research spaces, studios, and ateliers. The goals of the first laboratories were to foster the creation of new media projects which explored the impact of technology on society and the human condition, developed hardware and software within the context of artistic projects, and tested the potential of electronic technologies. Concurrently, in the late 1990s, the word "lab" was applied to humanities and technology, for example, HUMlab at Umeå University was founded in 1997 and Stanford Humanities Lab at Stanford University in 1999. Although the institutional models for these units were not new, their conceptualization as "lab" was an original move. Nevertheless, the end of the twentieth century and beginning of the twenty-first century remained under the domination of media labs.

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Since 2007, the situation changed significantly through the dissemination of the concept of a laboratory in the humanities domain. The laboratory concept has expanded rapidly across the humanities department (e.g., the Global History Lab in the Department of History at Princeton University, 2007; the Media Archaeology Lab in the Department of English at the University of Colorado, Boulder, 2009) and libraries (e.g., the Scholars' Lab launched in the Alderman Library of the University of Virginia, 2008). The trend towards building laboratories continued unabated, reaching the point of the *laboratory boom* after 2010 that converged with the computational turn in the humanities [Berry 2011], the development of the digital humanities [Gold 2012], and the emergence of virtual laboratory (Alfalab, a project of the Royal Netherlands Academy of Arts and Sciences, run in 2009-2011). Since 2010, the concept of laboratory has spread over the university campus, made inroads into city space and public cultural institutions [Mahey et al. 2019] and been launched in places that had never been designated for this purpose.

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Along with the humanities labs, with names referring mainly to disciplines and cultural categories (e.g., the Culture Lab at Brown University and Participatory Cultures Lab at McGill University), digital humanities labs have begun to proliferate right next to existing models of centers (e.g., the Digital Humanities Laboratory at Ecole Polytechnique Fédérale de Lausanne, Digital Humanities Lab at Utrecht University, and the Franke Family Digital Humanities Laboratory at Yale University). The proliferation of various labs in the humanities has led to the broadening of the concept of laboratory beyond the notion of a physical place. The term "laboratory" is used to describe the following places, initiatives, and ideas: an interdisciplinary department (the Humanities Lab at Lund University), a center (the HUMlab at Umeå University), a makerspace (the Maker Lab in the Humanities at the University of Victoria), an incubator for new ideas (the Humanities Lab at American University), a research workshop (the Northwestern University Digital Humanities Laboratory at Northwestern University), a collaboration of individuals (the Nebraska Literary Lab at the

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University of Nebraska), a coalition (the Humanities Action Lab led from Rutgers University-Newark), a student-led initiative (the Public Humanities Lab at the University of Virginia), a state-of-the-art facility (the Digital Humanities Lab at the University of Exeter), an innovative course (the Humanities Labs at Colby College), a study programme (the Humanities Lab at Leiden University), consortium (the DigHumLab at Aarhus University), a virtual research environment (the Digital Humanities Innovation Lab at the National University of Distance Education), and even a podcast (the Literature Lab Podcasts at Brandeis University). Consequently, the notion of laboratory has gone far beyond its traditional meaning, turning into a *project* that can be done or an *action* that can be taken, then dispersed all over the world. A good example of this approach is the Humanities Action Lab led from Rutgers University-Newark. It is a coalition of universities, organizations, and public spaces in twenty cities that collaborate to build community-curated public humanities projects. The lab can be created everywhere needed to engage a community around a particular challenge.

Thus, over the last years, we have observed the proliferation of humanities labs and the growing interest in a laboratory that implies a new mode of working. It suffices to mention conferences, panel discussions, and seminars devoted to the concept and organization of laboratory: "Building the Humanities Lab: Scholarly Practices in Virtual Research Environments", the panel session in the Digital Humanities conference at King's College London in 2010; "Theories and Practices of the Literary Lab" roundtable at Modern Language Association National Meeting in Boston in 2013; "The Hum Lab: A Consortial Workshop" at Haverford College in 2014; "The Humanities Laboratory: Discussions of New Campus Models", organized by Arizona State University's Institute for Humanities Research for the National Endowment for the Humanities in 2016; "Reimagining the Humanities Lab", a panel discussion at ADHO Digital Humanities Conference in Mexico City in 2018; "What Is a Feminist Lab?" symposium at the University of Colorado, Boulder in 2019; "Humanities Laboratories: Critical Infrastructures and Knowledge Experiments" workshop at King's College London in 2019; "Rebuilding Laboratories" workshop at the University of Birmingham in 2019; and "The Architecture of Science and the Humanities" workshop at Netherlands Institute for Advanced Study in 2019. This list shows that there is an urgent need to discuss this institutional model for the humanities and understand its implications for scholarly research and teaching practices.

Typology of Humanities Labs

To comprehend a laboratory in the humanities and identify its different realization, I firstly collected the descriptions of labs ranging from media labs to digital and non-digital humanities labs [Pawlicka-Deger 2019], scrutinize the context and meaning of the term "laboratory", analyse their mission statements, and further determine their functions. Before discussing the typology in detail, however, we can pose a significant question of what is a humanities lab in itself? To answer this question, let us look at below statements from three laboratories:

> At Humanities + Design our mission is to produce, through the lens of humanistic inquiry, new modes of thinking in design and computer science to serve data-driven research in the humanities. We believe that humanistic inquiry, grounded in interpretation, has much to contribute to the development of technologies if they are to help us reveal ambiguity and paradox, allowing human-scale exploration of complex systems. In the laboratory environment, theoretical and methodological discussions happen side-by-side with hands-on work with digital materials. Humanities scholars and students, designers, engineers, and computer scientists engage together in ongoing tool design as defined by the specific needs of participating humanities projects. [Humanities + Design n.d.]

> The Digital Humanities Laboratory (DHLab), a unit of Yale University Library, offers space, community, and resources for Yale scholars who are using computational methods to pursue research questions in the arts, humanities, and humanistic social sciences. Located inside Sterling Memorial Library, the Franke Family Digital Humanities Laboratory is a hub for consultations, training, and opportunities that support Yale students, faculty, and cultural heritage professionals in their engagement with digital tools and techniques. [Yale DH Lab n.d.]

The Humanities Lab at ASU is designed as an experimental space in which interdisciplinary faculty teams work with students from a variety of academic and cultural backgrounds to investigate grand social challenges, to construct researchable questions that delve deeply into those challenges, and to generate possible approaches to complex, "wicked" issues like immigration, health, and climate change, for which there are no easy answers. [ASU Humanities Lab n.d.]

The first lab, the Humanities + Design is a research lab at the Center for Spatial and Textual Analysis at Stanford University focused on designing and producing tools through the lens of humanistic inquiry. Critical thinking practiced by humanities scholars is thus applied to a hands-on work conducted by designers, engineers, and computer scientists. The lab team works on building open source tools for digital research, such as Data Pen, an instrument for creating data sets that draws from linked data sources, and a visualization tool Palladio. The second example represents a lab established as a shared space at the university's library. It is a facility that provides equipment and digital technologies and support in digital humanities skills acquisition for both research and teaching purposes through consultations, training, and guest lectures. This multifunctional lab has been built to offer space, community, and resources for scholars in the arts, humanities, and social sciences. The last statement, in turn, describes the Humanities Lab at Arizona State University which is a set of lab-based courses. The lab offers an experimental space where students and faculty work on a particular problem in intergenerational collaborative teams for one or two semesters. Each lab is devoted to a specific socio-cultural challenge that is investigated through critical thinking, critical engagement, hands-on practices, and interdisciplinary discussions. Although these three labs represent different functions and practices, each is guided by a "laboratory" ethos, defined by the Stanford Humanities Lab: collaborative, co-creative, and team-based [Hartwig 2011]. These features are the core of laboratory where the humanistic inquiry, knowledge, and practices are applied, produced, tested, and investigated.

This wide range of uses of the term "laboratory" implies that labs are varied due to the function and activities. Based on the collected data, I indicate the following six functions of laboratories in the humanities:

1. Research-focused lab - a place for conducting, coordinating, and promoting cross-disciplinary research, ranging from theoretical, critical, and methodological analysis and interpretations to practices based on learning-by-doing approach, such the application of digital tools, experimentation, and prototyping.
2. Design-focused lab - a place for designing and producing technical tools, applications, website, platforms, and creative works which provide new methods, tools, and a subject of critical research.
3. Work station-type lab - a place for providing equipment, hardware, software, and resource for facilitating research, teaching, and learning.
4. Service-focused lab - a place for meeting the individual needs of users through consulting, technological services (web hosting, maintenance, dissemination and preservation for digital projects), and computer services (support for conducting digital projects).
5. Public engagement-focused lab - a place that conducts research and organizes events related to social challenges and community affairs, creates community-curated and participatory projects, develops new ways of collaborations with public audiences, and promotes civic engagement.
6. Pedagogical-focused lab - a place for teaching, training, and learning through courses, seminars, lectures, workshops, etc. A laboratory that implies collaborative and experimental practices, entails the dissemination of new forms of teaching and learning in the humanities, including hands-on practices based on the learning-by-doing approach (popularized by creative spaces, makerspaces, and hackerspaces that practice prototyping, tinkering, and hacking; e.g. the Maker Lab in the Humanities at the University of Victoria and the Computational Humanities Lab at the University of Wisconsin–Madison); experiential learning and offsite research, that is to say, learning through direct experience outside a traditional academic setting, for instance, through traveling (The Global Humanities Lab course in the Alice Kaplan Institute for the Humanities at Northwestern University offers students the investigation of an international humanities through traveling to cities being the subject of the study) or field trips (e.g. the Encountering Food course of the Humanities and Arts Labs at Albion College where students explore local and global food through a series of projects and field trips and organize a community dinner); problem-based learning meaning that

students investigate an open-ended problem through collaborative and interdisciplinary practices (e.g. the Humanities Lab at Arizona State University); and community-curated public humanities projects (e.g. practiced by the Humanities Action Lab, a coalition of universities, organizations, and public spaces in forty cities, led from Rutgers University-Newark).

Since any laboratory is a self-defined entity focused on a specific function, activity, and practice, it can be difficult to build a common definition of the laboratory in the humanities. However, based on the above reflections, I attempt to create the following working definition of the humanities lab:

A laboratory in the humanities is a technical, research, and intellectual infrastructure for humanistic issues and inquiries which offers space (physical, virtual or conceptual), community, and resources to conduct a set of activities resulting from its specific function (e.g. research, design, work station, service, pedagogical, and public engagement). Laboratory initiatives are guided by the following principles: interdisciplinarity, collaboration, co-creation, team-based, and experimentation.

The widespread application of the term "laboratory" has led to the fact that there is no single model for the humanities laboratory. Based on more than two hundred laboratories, established in North America, North-Western Europe, and Australia, I determine five models for the humanities labs due to their situatedness (physical or virtual), traditions, functions, scholarly questions, practices, and activities. Let us now explore these five models (the center-type lab, the techno-science lab, the work station-type lab, the social challenges-centric lab, and virtual lab), investigate their organization and indicate a discourse from which they originate.

The center-type labs

To characterize the center model-based laboratories, it is essential to summarize the infrastructure changes that occurred in the humanities over the past years. In the 1990s, as previously stated, the first laboratories emerged in the humanities (e.g. the English Media Lab at the Department of English of the University of Manitoba in 1995 and the HUMlab at Umeå University in 1997) modelled upon media labs for providing digital and analog media, facilitating the use of digital and online resources, and assisting with the application of digital tools for the study of literature, language, culture, and history. Since the 1990s, the digital humanities have been rapidly developing through establishing the first humanities computing centers, later becoming the digital humanities centers, defined by Zorich as "an entity where new media and technologies are used for humanities-based research, teaching, and intellectual engagement and experimentation" [Zorich 2008, 4]. The center played a crucial role in facilitating and reinforcing digital humanities research at the university by providing digital resources, services, and tools, supporting the teaching of new digital practices, and hosting symposia and lectures (e.g., the Centre for Computing in the Humanities at King's College London established in 1991 and Maryland Institute for Technology in the Humanities in 1999). Along with the proliferation of the digital humanities centers, a new institutional unit emerged in the humanities — a laboratory — modelled on a center for advancing and fostering the humanities research on and with digital technologies (e.g., the Electronic Textual Cultures Lab at the University of Victoria founded in 2005 and Scholars' Lab at the University of Virginia in 2006).

The next changes involve the reorganization of digital humanities centers into departments (e.g., the Centre for Computing in the Humanities was renamed the King's College Department of Digital Humanities) and thereby, the institutionalization of the discipline and the establishment of digital humanities programmes and degrees. Later, the infrastructure of the center would be a strategic choice for the university to further set up the department of digital humanities (e.g. the Department of Digital Humanities at the University of Helsinki grew out of the Helsinki Centre for Digital Humanities, research network, and infrastructure established in 2016). Meantime, laboratories have been launched in the humanities departments and libraries, emulating the center model or establishing an entirely new infrastructure for the humanities research, teaching, and activities.

Laboratories built upon the center model are a central institution at the university for conducting, coordinating, and promoting research, teaching, and infrastructure for digitization in the humanities and social science. They play a key role in building collaboration across departments and providing support and training to the entire university, as

exemplified by the Price Lab for Digital Humanities at the University of Pennsylvania: "The Price Lab serves as a central node of communication and exchange across Penn's many departments, centers, and schools with expertise and interest in the digital humanities" [Price Lab for Digital Humanities n.d.]. Instances of laboratories that were influenced by the center model in other institutions include: the HUMlab at Umeå University (1997); the Humanities Lab at Lund University (2005); Electronic Textual Cultures Lab at the University of Victoria (2005); the Scholars' Lab at the University of Virginia (2006); the Digital Humanities Lab at the University of Basel (2010); the Carolina Digital Humanities: Digital Innovation Lab at the University of North Carolina at Chapel Hill (2011); the UC Arts Digital Lab at the University of Canterbury (2011); the D-Lab at the University of California, Berkeley (2013); the NULab for Texts, Maps, and Networks at Northeastern University (2013); the Digital Humanities Lab at Utrecht University (2014); the Digital Humanities Innovation Lab (LINHD) at the National University of Distance Education (2014); the Franke Family Digital Humanities Laboratory at Yale University (2015); and the Price Lab for Digital Humanities at the University of Pennsylvania (2015),

The center-type lab model is identified by the following features:

<div style="text-align: right">37</div>

- Physical situatedness – the lab is mainly located in humanities departments or in libraries;
- Manifold functions – the lab carries out various functions from conducting and coordinating cross-disciplinary research to providing space, equipment, and resources to facilitating research, teaching, and learning;
- Facilities and equipment – the lab offers space, resources, and equipment for conducting and facilitating research projects;
- A wide range of research projects – the lab involves research groups and projects devoted to the broad scope of humanities study;
- Academic appointments and staffing – the lab affiliates faculty and researchers as well as its own staff;
- The community – the goal of the lab is to bring together faculty, staff, and students as well as independent scholars and participants from cultural institutions and industry interested in a particular discipline, practices, and methods through series of open lectures, workshops, and seminars;
- Education – the lab offers teaching and training in the form of workshops, courses, academic degree programs, postgraduate and faculty training, fellowships, internships, and summer schools;
- Service – the lab offers a number of services to support faculties, staff, and students: consulting, providing technology solutions, maintaining and preserving digital projects, etc.

While any one of these features might be present in other models, the center is clearly distinguished by a large-scale central role in advancing humanities scholarship as well as supporting the study and the uses of digital methods and technologies for research and teaching in the humanities.

<div style="text-align: right">38</div>

The techno-science labs

In the natural sciences a laboratory is an ordinary place which provides facilities, instruments, and equipment with which to conduct experiments, test hypotheses, and investigate samples. Science laboratories have a long history dating back to the alchemical laboratory in the sixteenth century; however, for the purposes of this paper, we will focus on the techno-science model developed in the second half of the twentieth century, along with the acceleration of technological innovation. A crucial moment in a lab history occurred when the laboratory was exposed as a space for constructing knowledge through the use of technology and instruments rather than a place for revealing reality. Sociology of scientific knowledge, mentioned in the previous section, played a key role in this movement. Techno-science implies that science cannot be detached from the technological tools that shape our perceptions and help to produce the knowledge; thus, our observations are always embodied via the practical use of instruments.

<div style="text-align: right">39</div>

Techno-science labs associated with the categories of production, technology, innovation, and experimentation became an inspirational architecture for the humanities in need of a new place to explore the emerging innovative uses of technology in the study of history, art, and culture. Therefore, the impulse to establish a laboratory in the humanities came about in order to replicate the knowledge production environment associated with science. A science-based lab is thus seen as a driving force for cutting-edge projects and a natural space for developing and applying technologies to

<div style="text-align: right">40</div>

humanities research. The following labs are good representations of the techno-science lab model in the humanities: the Stanford Humanities Lab at Stanford University (1999-2009); the Critical Media Lab at the University of Waterloo (2008); the CulturePlex Lab at the University of Western Ontario (2010); the Digital Humanities and Literary Cognition Lab at Michigan State University (2012); the Humanities + Design a Research Lab at Stanford University (2012); the Maker Lab in the Humanities at the University of Victoria (2012); the Poetic Media Lab at Stanford University (2013); and the King's Digital Lab at King's College London (2015).

Based on these examples, laboratories built using the techno-science model are driven by the following functions: providing state-of-the-art facilities and equipment for experimental and innovative research; promoting new ways of conducting research, teaching, and learning through the application of digital technologies; introducing new digital methods and new modes of knowledge (e.g., data mining, mapping, data visualization, simulation, 3D digitisation, tinkering, coding, prototyping, and fabricating); producing data-driven research in the humanities; designing applications, tools, and platforms used in digital humanities research and teaching; and designing technical infrastructure for the humanities.

The principles that guide the techno-science-based laboratory are identified as:

- Physical situatedness – the lab is located in a particular place, in different departments (e.g. the Critical Media Lab is housed in the Institute of Experimental Design and Media Cultures, while the Digital Humanities and Literary Cognition Lab at the Department of English), and shared by people coming from various disciplines who work together on research projects;
- Equipment and technology – the lab is equipped with technological devices and tools that are necessary for conducting experiments and innovative projects; for example, hardware, software, applications, platforms, 3D digital technologies, eye-tracking systems, and so forth;
- Interdisciplinarity – strong post-disciplinary modes of research carrying out by humanities scholars, designers, computer scientists, software analysts, and engineers;
- Experimental research – conducting a technology-based project that attempts to explore new methods of creativity, fill research gaps, and open new scholarly perspectives;
- Manual work – doing hands-on work with the use of material devices, instruments, and technologies;
- Collaboration – projects are done via collaborative actions between faculty, staff, and students, between different disciplines and departments, and between the university, industry and the public sphere;
- Applied research – designing applications, tools, digital methods, and resources to meet the specific needs of humanities projects (e.g., Breve and Palladio, which are open-source tools for research designed by Humanities + Design a Research Lab);
- Products – the lab work is focused on designing measurable, applicable, and practical products, for instance, the Lacuna tool, produced by the Poetic Media Lab at Stanford University, is used in the Rhizomatic Reading project developed at the Center for Digital Humanities in the Princeton University Library to analyse connections across literary texts.

The humanities labs originated from techno-science labs are focused on production, tools, and research products. Although they stress the notions of community and collectivity, these concepts are not their goals in and of themselves but rather a way to achieve their objectives. Each lab represents distinct aspects and missions, but their common and the most significant feature is technology "being the glue", to use Pierre Proske' description of the Media Lab Melbourne [Proske 2013]. Digital technology, tools, and platforms are at once the methods, the research, and the objects of study themselves. Drawing on the description of Stanford Humanities Lab, we can summarize that these labs involves a "triangulation of arts practice, commentary/critique, and outreach, merging research, pedagogy, publication and practice. They didn't just comment and discuss, they built: new media, interactive archives, predictive models of social change, new courses, collaborative research workshops, art exhibitions" [Hartwig 2011].

The work station-type lab

The next model is called both the work station and service model [Maron et al. 2014], referring to the idea of desktop

classrooms, a computer lab, and instructional technology spaces. This type of laboratory operates as a physical room that accumulates equipment and devices used to support faculty and students in their work. It functions as the work space that supplies facilities, such as editing software, digital cameras, and audio recording devices; provides services, such as printing and studio spaces; and supports the use of software and devices. Labs based on the work station model are located mainly in libraries, which play a key role in facilitating humanities research by providing resources and equipment. The library is also seen as a major place for digital humanities since it typically carries out the following tasks: digitizing materials, building digital collections and resources, and supporting research data management. Examples of the works station-type laboratories include: the Digital Scholarship Lab at Brown University (2012); the Digital Humanities Lab at the University of Massachusetts Amherst (2012); the Digital Humanities Lab at the University of Wisconsin-Milwaukee (2013); the Digital Scholarship Lab at the University of Oklahoma (2014); Willson Center Digital Humanities Lab at the University of Georgia (2015); the Digital Humanities Lab at Bowling Green State University (2015); the Digital Humanities Lab at Rutgers University (2015); the Humanities Research Lab at California State University, Northridge (2016); the Digital Humanities Lab at the University of Exeter (2017); the Digital Humanities Lab in the Centre for Digital Humanities Research at Australian National University (2017); and the Digital Scholarship Lab at Michigan State University (2018).

These labs are guided by the following functions: supplying facilities, equipment, and devices; supporting faculty and students in their studies; providing help in research data management; and training faculty and students in regard to the utilization of equipment, digital tools, and software. | 45 |

The work station model is distinguished by features listed below: | 46 |

- Physical situatedness – the lab is located mainly in libraries but also in the humanities departments;
- Reconfigurable space – the place is made to be adjusted according to needs and conditions; for example, the Digital Scholarship Lab at the Brown University Library can be converted from a lecture hall to a team project room;
- Facilities, equipment, and technological tools – the lab provides different types of facilities (sound recording studio, interview room), equipment (computers, cameras, eye trackers, 3D printers), and software;
- Specific function – the lab defines its purposes clearly, which may range from providing equipment and tools for students, supporting research data management, offering technical assistance, such as metadata encoding and archiving digital projects, and training faculty and students on the use of various media and tools;
- Specific users – the lab targets specific users who have access to the lab and permission to use its facilities; for instance, the Digital Humanities Lab at Rutgers University is available only to members of the Rutgers digital humanities community;
- Terms and conditions – since the lab welcomes everyone from any discipline and level of experience, it provides rules related to the use of the lab's facilities and equipment.

The humanities lab as a work station aims to provide an environment, services, and facilities which support scholarly work rather than innovative research projects, as in the case of techno-science labs. A laboratory is thus understood literally as a place — referring again to Hannaway's definition — equipped with specialized instruments and apparatuses that require hands-on skills and knowledge for their utilization. | 47 |

The social challenges-centric lab

The next model of a humanities laboratory grows out of social labs, community labs, and citizen labs [Hassan 2014] [Kieboom 2014] [Tiesinga et al. 2014] [Ricaurte Quijano 2018] as well as public humanities initiatives. It comes from seeking "new research methods, new lines of inquiry, and new ways of engaging with public audiences" [FHI-DU Humanities Labs n.d.] for tackling real-world problems and stimulating social changes. Marlieke Kieboom claims that one way to address global and local problems is to establish a new space entailing new practices, methods, and solutions; a promising place for undertaking the challenges is a laboratory seen as a "container for social experimentation" [Kieboom 2014, 9]. A lab implies new practices, such as collaboration, integration, public action, and | 48 |

dialogue across departments, institutions, and communities. A laboratory is an experimental space where the humanities can merge with other disciplines and take part in the process of addressing local and global concerns. The great example of this model is the Humanities Lab at Arizona State University founded by Sally Kitch in 2017 to enhance problem-based study and interdisciplinary and intergenerational collaboration. As Kitch said, "I started the Humanities Lab because I realized that our students were not benefitting from the kind of interdisciplinary, exploratory experiences faculty were getting through the IHR. (…) So I wanted to see if we could establish a way for students to get that experience; to recognize the humanities as important for approaching and addressing today's challenges, because the kinds of questions that really plague us are humanistic at their core. They're about values and culture and understanding the way people form beliefs and the kinds of attitudes we carry around with us and the way we all live in our own narratives. And encountering that is essential for solving these problems." [Greguska 2019] The Humanities Lab was created as an experimental space for investigating "wicked" problems, such as immigration, health, and climate change through the humanities inquiry approach and intervention: "Most of the really big challenges we face are not fundamentally about technology, science, economics, etc. They are human challenges that have been with us for a very long time and therefore require human-centred inquiry as part of the search for a solution. Yet, often the humanities disciplines are not included in such discussions. Therefore, the Humanities Lab brings the humanities to the table by emphasizing the study of values and the way we understand the world around us. Merging the humanities with diverse disciplines helps us to see the grand social challenges more holistically and therefore puts us in a better position to conceptualize solutions." [ASU Humanities Lab n.d.]

Unlike the techno-science model, which is centred on designing and applying technological tools to research projects, the social challenges-centric model aims to build a common and interventive space that in itself is a way to address the most profound social issues. I indicate three varieties of the social challenges-centric model for a humanities lab: coalition-based lab, problem-based lab, and community engagement lab. This model is thus not a unified structure, but a dynamic form driven by the ideas of community, dialogue, and intervention.

The first type of lab arises as an initiative of a coalition of various institutions that activate a laboratory as an urgent need to react to pressing problems in a particular place. The Humanities Action Lab (HAL) is a coalition of universities, issue organizations, and public spaces in forty cities led from Rutgers University-Newark. Students and stakeholders in each city investigate a particular problem in a local context, produce community-curated public humanities projects, and stimulate public dialogue on the urgent questions. Laboratories can also work on the same problem explored then by different communities and from various perspectives. They develop local contributions to national project that further "travel nationally and internationally to museums, public libraries, cultural centers, and other spaces in each of the communities that helped create them" [HAL n.d.]. The examples of national projects are "Guantánamo Public Memory Project" hosted by Columbia University. This initiative involved over 300 students from 13 universities to research, document, and interpret the history of the US naval base at Guantánamo Bay, Cuba. "Students from around the country collaborated with more than 600 community stakeholders including Haitian refugees, former service people, and attorneys representing current detainees, to explore GTMO's history from many perspectives, as well as the questions it raises today. Together they created a traveling exhibit, web platform, digital and physical archive, interview collection, and series of public dialogues. The exhibit has traveled for more than 3 years to 18 cities and counting, with public dialogues in each place. More than 500,000 people will have had a face-to-face encounter with the exhibit, and many more online and through social media" [HAL n.d.]. This type of laboratory is a great example of how the humanities can bring together people from various institutions around a particular challenge, participate in public dialogue and call for action at the local and national level.

The problem-based lab is in turn set up around a central theme for a specific purpose. It thus creates an environment — problem space — around particular urgent social and cultural issues that need to be addressed by integrative and interdisciplinary approach. Good examples are the labs within the Humanities Laboratories at the Franklin Humanities Institute of Duke University, where each individual lab is devoted to a particular problem and launched for mainly three years. The first lab at the FHI, Haiti Lab, was established after Haiti's natural disaster in 2010 to broaden knowledge about Haitian culture, history, and language and expand Haitian studies in the U.S. Other labs at the FHI devoted to significant social phenomena and challenges are BorderWork(s) Lab (2011-2014) investigating the acts of division and

demarcation in the world; Health Humanities Lab (2016- present) undertaking issues of clinical medicine and public health from the perspective of the humanities and social science; and From Slavery to Freedom Lab (2018- present) examining the life and afterlives of slavery and emancipation. The similar type of problem-based lab is also set up within the Humanities Lab at Arizona State University where each lab works as a one- or two-semester course bringing together students and faculty around "wicked" issues. The lab is thus established for a fixed period of time to investigate grand social challenges, construct researchable questions, and generate possible approaches to complex problems. So far, the Humanities Lab program has launched the following courses: Health & Wellbeing Lab, Sexual Violence Lab, Sustaining Humans Lab, Rebuilding Puerto Rico Lab, and Facing Immigration Lab. The next great example, differing from the previous ones, is the Human Security Collaboratory (HS Collab) launched by the Global Security Initiative (GSI) at Arizona State University focused on addressing complex problems related to digital security and civil rights through the application of digital humanities tools and inquiries. The lab's current projects include "Border Quants", a collective of artists and scholars conducting research related to digital human rights, personal data protection, and decolonial approaches to data use, and "Vibrant Lives", an immersive performance installation as a critical comment on the use and monetization of personal data production. The important part of the lab's activities is a public engagement through events, such as a series of lunchtime conversations about digital human security issues.

The third type of lab — the community engagement lab — aims to promote civic engagement through participatory approaches to research and social action. Good examples are the mentioned HS Collab at Arizona State University and the Engage Media Lab at The New School. The latter lab is a student group and research lab that develops workshops, screenings, and research projects in collaboration with The New School students and the New York City community. Other instances include the Public Humanities Lab at the University of Virginia and the Participatory Cultures Lab at McGill University. The last one is particularly focused on participatory research devoted to issues of social justice, gender-based violence, food security, and poverty alleviation. Research projects use various tools that engage a community: digital storytelling, photovoice, participatory archiving, and more. Community engagement projects are conducted through the collaboration with variety countries including South Africa, Ethiopia, Mozambique, Vietnam, and Indonesia. `52`

To summarize, instances of laboratories built upon the social challenges-centric model include: the Humanities Laboratories at Duke University (2010); the Participatory Cultures Lab at McGill University (2010); the Engage Media Lab at The New School (2011); the Humanities Action Lab led from Rutgers University-Newark (2014); the Human Security Collaboratory (HS Collab) at Arizona State University (2015); the Humanities Lab at Arizona State University (2017); and the Public Humanities Lab at the University of Virginia (2017). `53`

Based on these cases, the social challenges-centric model of labs can encompass the following functions: building a community around the lab and challenges; fostering collaboration and communication across departments, institutions, and communities; engaging with the local community beyond the university; connecting the diverse local perspectives of communities around the world; producing community-curated public humanities projects; propelling positive social, cultural, and environmental changes; promoting civic engagement; and initiating new public dialogues. `54`

The model is guided by the following principles: `55`

- Flexible structure – the lab can be situated physically or virtually and formed as a meeting place, research group or course; in this sense, a lab can be created anywhere at the university or beyond;
- Flexible duration – the lab can be set up for a specific period of time and then can be closed down once a project is concluded and goals are achieved;
- The community – people gathered around the lab are the main resources and their dialogue are the driving forces of the lab;
- Collaboration and integration – the lab is an integrative environment for faculty, staff, students, and the local community;
- Specific purpose of the lab – the goals are particularly related to social challenges, global "wicked" problems, and the local community;
- The infrastructure of engagement – the lab works as the infrastructure that provides space and tools for

intervening in social issues, translating ideas into action, and enhancing the engaged humanities;

- A wide range of methods – the lab uses various methods for tackling problems, such as public dialogues, interventions, digital methods, interviews, testimonies, prototyping, and participatory-based methods;
- Public actions – public initiatives are a product of the lab, including exhibits, web platforms, digital and physical archives, interview collections, and series of public dialogues.

The social challenges-centric model for the humanities lab originates from the concepts of social labs, citizen labs, and public creative spaces. While the techno-science model is centred on applied research, technological issues, and innovative approaches, the social challenges-centric model is created around people, social issues, and public engagement. Further, while the techno-science model produces quantifiable and applied projects, the products of this model of labs are dynamic, powerful, and influential. As Zaid Hassan claims, "Complex challenges are therefore dynamic and can change in unexpected ways over time, whereas technical challenges are relatively stable and static in comparison" [Hassan 2014]. To conclude, the social challenges-centric model can be created in any environment where there is a need to initiate dialogue and collaboration across communities to solve particular local problems. `56`

The virtual lab

Thus far, the term "laboratory" has been used in the context of Hannaway's definition of a place which accumulates instruments, techniques, and apparatuses. The techno-science, work station, and community labs have one major thing in common, which is physical situatedness [Svensson 2015]. A concrete location with an infrastructure and facilities determines the knowledge creation practices, the collaboration methods, and social interactions. However, in recent years, along with the development of cyberinfrastructure, we have witnessed the expansion of a new lab model: the virtual laboratory. `57`

The advancement of cyberinfrastructure underpinned the development of the digital humanities field that applies computational tools and methods to the humanities. The discipline of digital humanities is based on the utilization of digital source materials, digital methods, and new ways of collaborating in the digital environment. The core feature of the digital humanities is thus virtual situatedness, defined as the digital, internet-based workspace with an infrastructure, connection, and operation that affect the work and research communication. Scholars work in the virtual space, including online platforms and the virtual research environment, which directs digital humanities research, supports the use of digital tools, and enables scholarly collaboration. Digital humanities scholars are thus examples of researchers who work in both physical and virtual spaces. Therefore, their research rooms comprise physical places, such as a laboratory or center, as well as a virtual laboratory. Hence, the concept of laboratory goes beyond the category of physical location towards a placeless and virtual idea not determined by walls and physical situatedness. The virtual model of the humanities lab plays a key role in the cyberinfrastructure that enhances the web-based research environment, supports national and international collaborations, facilitates networks of scholars, and provides data services, resources, and tools. `58`

Given the scope of the function and the operation of the virtual laboratory, the model comprises two types of labs. The first is formed as a collaborative platform for enhancing communication and cooperation and promoting new modes of learning and research with the use of digital tools and technologies. HASTAC (Humanities, Arts, Science and Technology Alliance and Collaboratory) constitutes a good example of this initiative. It is a community-based publishing and an academic social networking platform that enables global communication, sharing, and collaborations among students and researchers across the humanities, social sciences, media studies, the arts, and technology sectors. Alfalab (2009-2011), in turn, was a collaborative network and a virtual project of five institutes of the Royal Netherlands Academy of Arts and Sciences that aimed to promote, provide, and apply the use of digital tools and methods in the humanities research practices and foster a cooperation of humanities researchers at national and international levels. `59`

The second type, called the virtual research environment, is a virtual space for facilitating digital research processes, providing databases, tools, and services, and promoting collaboration across the university, academic institutions, and cultural organizations. It is an innovative, web-based, and community-oriented digital environment with an international dimension, defined by Annamaria Carusi and Torsten Reimer as a "set of web applications, online tools, systems and `60`

processes interoperating to facilitate or enhance the research process within and without institutional boundaries; it enables collaborative research activities beyond geographical barriers" [Carusi et al. 2010, 12]. Examples of virtual research environments for the humanities are the TextGrid Laboratory provided by DARIAH-DE; DHVLab, the Digital Humanities Virtual Laboratory carried out at the Ludwig Maximilian University of Munich (it consists of a teaching and research infrastructure in the applications and methods used in the digital humanities); HuNI (Humanities Networked Infrastructure), a virtual laboratory developed as part of the Australian government's NeCTAR (National e-Research Collaboration Tools and Resources) program (it is a platform that combines data from many Australian cultural websites into the humanities and creative arts database); the Digital Humanities Innovation Lab (LINHD) at the National University of Distance Education in Spain (a laboratory that serves as a hub for infrastructures and tools for digital humanities projects in Spain and Spanish speaking countries); and the Nordic Digital Humanities Laboratory (NDHL), the ongoing initiative that aims to create convergence in Nordic humanities and arts e-infrastructures through a participant-driven virtual laboratory for data-intensive research.

Hence, the structure of the virtual model of the humanities laboratory can be grasped through:

- Virtual situatedness – research and collaboration processes take place in the digital and shared workspace;
- Technology and software – they are key composers of virtual spaces and the main conditions for sustaining, accessing, and using the virtual laboratory;
- Users-driven – the virtual lab is created for and by the research community; thus, the development of the virtual lab depends on users' activities, support, and feedback;
- Network approach – the main purpose of the lab is building the interaction and collaboration network between researchers, universities, and organizations;
- Service and resource-based project – the virtual lab provides data services, digital materials, tools, and an environment for research practices and collaboration;
- Terms and conditions – the lab space is determined by the terms and conditions related to access, using, and sharing the data and other resources within the virtual platform.

The advancement of cyberinfrastructure ushered in the era of virtual laboratories, created in the digital environment beyond physical, geographical, and cultural borders. Similar to the center-type lab, the techno-science and work station-type lab, the virtual laboratory facilitates scholarly practices and enables collaborative, innovative, and technology-based projects. Hence, the virtual lab represents a laboratory with the aspects characterized by the rest of the models. The main difference lies in situatedness; while the previous labs are all determined by a physical location and physical infrastructure, digital labs are signified by virtual milieu and software.

Conclusions

The paper has shown that the laboratory turn has emerged in the humanities as a part of a wider process of the *laboratorization* of social life, which has been occurring since the 1980s and with a significant intensification in the last ten years. The emergence of the laboratory in the humanities is thus the effect of superimposing three discourses that appeared in different domains: in the humanities, social sciences, and culture. Laboratories made inroads into the humanities, introduced new methods and practices and put the humanities on a par with applied science. A laboratory, however, is more than a new infrastructure within the humanities, it is a "meeting place" [HUMlab n.d.], an "incubator for new ideas" [AU Humanities Lab n.d.], and a "conceptual vehicle" [Critical Media Lab n.d.]. The lab becomes conceptualized as a way of thinking entailing new social practices and new research modes (collaboration, experimentation, and hands-on practices). Hence, the laboratory turn has been driven by the movement away from building physical labs towards creating concept-based laboratories (lab courses, lab projects). The study has shown that the year of 2010 became a significant period in the history of the laboratory in the humanities. The Franklin Humanities Institute at Duke University established a new model for the humanities labs, which gave rise to conceptual laboratories seen more as problem-based projects rather than physical work spaces. This essay has focused on the application of the term "laboratory" to the humanities field in the academy. Therefore, the issues of the implementation of labs beyond this field and the university's campus remain still unexplored, including the emergence of labs in GLAM sector, the formation of cultural and citizens labs along with makerspaces and hackerspaces in public domain, and the use of the

word "lab" in different areas of social life. Humanities labs constitute part of the ongoing move towards turning various social spaces and initiatives into a *laboratory* that is a good lever to intervene in local and global complex problems, testing and scaling ideas, and designing prototypes through a collaboration of experts and citizens.

The second major finding was that the implementation of laboratory emerged as the essential process in the development of the humanities, one, which required the reconstruction of infrastructure to support new research practices and methods related to the utilization of technology and digital tools. Therefore, the digital humanities have become the driving force behind building a laboratory space, which supports situated practices, the collaborative, and technology-based projects. Furthermore, the digital humanities have propelled the development of the virtual laboratory, which involves virtual situatedness, a collaborative and academic network, and the digital research environment. 64

The next significant finding to emerge from this study is that borrowing the laboratory concept from science does not mean imitating its form and features. The humanities have developed unique models of labs differing in the scale of operation, infrastructure, and functions: the center-type lab, the techno-science lab, the work station-type lab, the social challenges-centric lab, and virtual lab. The previous section has shown that each type produces knowledge resulting from a lab structure and mission. Humanities labs do not represent a unified structure; instead, they consist of a group of various types of labs, which have their own architectures, goals, and practices. As a result, the humanities lab does not simply imitate the science lab but adapts this new infrastructure for its own purposes and needs. What fascinates me here is also the way how the humanities reposition themselves in the academy and public domain by bringing the field into dialogue with the sciences in interdisciplinary labs, building their own infrastructure, and designing a lab as a site of intervention in social challenges. 65

This study has important implications for understanding the concept of laboratory in the humanities as well as developing new models and sites. However, one challenge of the humanities lab remains to be discussed: its sustainability. The problem of sustainability concerns any model of laboratory [Maron et al. 2014]. It is a question of maintaining the long-term viability of a lab and sustaining the commitments of time and effort made by the people who are the core of the laboratory. Through examining lab projects that completed their activities (e.g., Alfalab, 2009-2011; the Computational Humanities Lab at the University of Wisconsin–Madison, 2012-2014; the Digital Cultures Lab at Douglas College, 2014-2018), it becomes clear that it is a major concern requiring further investigation. The Digital Matters Lab at the University of Utah has taken action in that direction and chosen the topic of "sustainability" for its activities and projects through 2022. It aims to address the questions of the accessibility of digital materials and the sustainability of in-progress artefacts [Digital Matters Lab n.d.]. Thus, the humanities lab is a fascinating phenomenon in the history of the humanities and many issues regarding its infrastructure, action, and impact require further analysis and reflection. 66

Acknowledgements

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