

## 24 THE HUMANISTSCOPE — EXPLORING THE SITUATEDNESS OF HUMANITIES INFRASTRUCTURE

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The humanities have a complex relation to infrastructure. Humanists engage with infrastructure—the university, digital systems and tools, cultural heritage institutions, seminar rooms, and networked computing—on a daily basis. They also carry out critical work on infrastructures through looking at matters such as the history of scientific instrumentation and the social, cultural, and political situatedness of systems such as national infrastructures. However, when it comes to thinking about the humanities in terms of infrastructure, there seems to be a lack of both everyday systemic awareness and extensive critical work. Humanists do not thus necessarily think of what they do as situated and conditioned in terms of infrastructure, which leads to challenges when it comes to imagining and implementing new infrastructures. There has been a lack of infrastructural engagement from the humanities, and I argue that this has been at our own cost. Such engagement does not necessarily boil down to requesting funding for technology, but to consider our work and future in infrastructural terms. The digital humanities has been helpful in drawing our attention to our infrastructural needs, and I suggest that the field can help us unlock infrastructural thinking and making.

This challenge is also one of moving from critical sensibility to creative, if conditioned, making, which often does not come easy to the humanities. A real risk is therefore that new humanities infrastructures will be based on existing infrastructures, often filtered through the technological side of the humanities or through the predominant models from science and engineering, rather than being based on the core and central needs of the humanities. This is an important concern and possibility for the humanities. This chapter explores the conditions necessary to allow the imagination and implementation of humanities-based infrastructures as conceptually, critically, and materially situated.

While academic infrastructure as constructed by governmental and funding bodies may make reference to the humanities and social sciences, this seems to be mostly a nominal interest. Infrastructural funding given to these areas is very small in comparison, and actual investments made in humanities infrastructure tend to be based on a notion of infrastructure taken

from other domains or based on certain qualities of familiar infrastructures, such as the library. Some humanistic fields are more likely than others to be recognized as infrastructure, including cultural heritage, language technology, computational linguistics, and archeology. This does not, however, mean that they should automatically be regarded as the main model for humanities infrastructure.

Moreover, while there is an emerging body of humanities scholarship exploring infrastructure critically, such work does not normally engage with the infrastructure of the humanities. Neither does this critical awareness seem to be applied when the humanities conceptualize and make their own infrastructures. In particular, it seems difficult to infuse intellectual issues and scholarly challenges into infrastructures as articulated in various white papers and reports on humanities research infrastructure. Technology and methodology often get foregrounded at the expense of a strong link to the core of the humanities. At the same time, such articulations of infrastructural visions paradoxically lack a deep engagement with the material level of infrastructure and the associated making.

Even if it is necessary to point out the fact that the humanities as a whole are marginalized in the specification and allocation of infrastructural resources, it is more important that the humanities present far-reaching thinking about what their infrastructure could be than oppose the current state of affairs. Such a strategy involves acknowledging the fact that making a case for infrastructure is one of politics and packaging as well as ideas, people, and equipment. An important note here is that while there is need for much stronger infrastructural support for the humanities, I am not suggesting that the humanities need as much infrastructural funding as science or engineering. These areas are larger to begin with (given current priorities), and the realpolitik of infrastructure and research policy (and common sense) will prevent such a trajectory in any case.

Essentially infrastructure is about situated imagination, and it would seem that the humanities lack a clear and systematic idea about their current and future infrastructure. In this chapter, I argue that we need to see infrastructure as situated culturally, socially, politically, technologically, and spatially. If we are to base our future infrastructure on a science and engineering model, on the library, or on the sense that we do not need any infrastructure, it should be a carefully thought-through decision. Naturally, we are not concerned with one decision or one type of infrastructure, but rather, we need to work toward a humanities-wide perspective and a framework connected to the humanities as a scholarly and educational endeavor. Among other things, this stance requires us to connect the conceptual level to the material level, and neither shy away from the ideational underpinnings nor the material details of implemented infrastructure.

I suggest that the idea of a humanistiscope, a humanistic infrastructural platform, can be used to free ourselves somewhat from our own infrastructural past and science and

technology-driven visions of humanities infrastructure, while also acknowledging the need to incorporate and learn from these perspectives. It might have been possible design humanistic microscopes or telescopes, but such “scopes” come with very particular situatedness, function and scientific heritage. Instead, I propose that the idea of a humanistiscope as a rhetorical and practical device can help us reconnect the humanities and their infrastructures. It is much less laden than the aforementioned devices, although it borrows from a scientific infrastructural logic and the Greek for “to look/examine” (which also points to the commonplace privileging of the visual in the infrastructure turn).

There are several reasons for using the humanistiscope as a “thought piece.” For one thing, there is not necessarily a name for the kind of things under discussion here (existing or possible humanistic infrastructures), and the notion of the humanistiscope gives us a way of packaging and imagining humanities infrastructure without being locked into current vocabulary and infrastructures. Additionally this device allows us to appropriate language that belongs to science, technology, and engineering as well as being usefully suggestive and provocative within and outside the humanities. There is also a helpful material push in the idea of humanistiscopes, as they would seem to be material devices one way or another. It should be stressed, however, that the idea is not to exoticize the humanities and humanities infrastructure or to discard previous layers of infrastructure. The humanities need to articulate their own infrastructural visions, but they also need to relate to the larger world of infrastructure and to their own past.

The chapter starts off with an extended background of the infrastructure turn and humanities infrastructure followed by an analysis of a call for proposals for data-intensive projects in the humanities. This leads to a more general discussion of academic infrastructure and a look at two main infrastructural templates for humanities infrastructure. The latter part of the chapter discusses the humanistiscope in more depth, including criteria and potential use, and some examples of humanistiscopes are presented. These examples are based on my experience from HUMlab at Umeå University. I argue that humanities infrastructure often may be multiplex beyond what fits in one humanistiscope, and that platforms such as humanities laboratories can be useful in allowing the alignment of many humanistiscopes.

## Background

Over the last fifteen years there has been an increasing interest in academic infrastructure under rubrics such as cyberinfrastructure, research infrastructure, and e-science. The 2003 National Science Foundation report “Revolutionizing Science and Engineering Through Cyberinfrastructure,” the introduction of the UK-based e-science program in 2000, and the

formation of a European Strategy Forum on Research Infrastructures (ESFRI) in 2002 have been important factors for this development. The infrastructure turn, as Geoffrey Rockwell (2010) describes it, has been characterized by an opening up of academic infrastructure in two senses. First, there has been an interest in moving beyond actual equipment to also including services and people. Second, there have been attempts to include other academic areas than those normally associated with large investments in infrastructure, including the social sciences and the humanities. One interpretation of this more open stance is that it is part of repackaging infrastructure discursively to make a case for new funding.

Hence it is not surprising that the humanities are often included nominally, but not actually, in terms of significant funding allocations or far-reaching thinking about humanities infrastructures. For instance, the “What are RIs” page on the ESFRI website tells us that research infrastructures are “tools for science,” that they should be “at the core of research and innovation processes,” and that they offer “unique research services to users from different countries, attract young people to science, and help to shape scientific communities” (European Commission 2013). A couple of examples of high-quality, important research infrastructures are given early on in this text: radiation sources, genomics data banks, environmental sciences observatories, imaging systems, clean rooms for developing new materials, and nano-electronics. As observed by Christine Borgman (2007), such definitions, by example, are common in infrastructure discourse. And although social sciences and libraries are mentioned in a cursory way at a later stage in the text, it seems quite clear that this kind of presentation does not make an effort to include the humanities or to speak to a community outside of science, technology, engineering, and mathematics (STEM).

The report “The Swedish Research Council’s Guide to Infrastructures 2012” makes this pattern clear. Crude frequency statistics show that “science” occurs 190 times and “humanities” 36 times, while there are 92 instances of “biology” and no instances of “linguistics” or “archeology.” We should be careful not to draw too far-reaching conclusions from this kind of data, of course, but this pattern points to the humanities mainly being dealt with on an aggregate level rather than at a discipline level. There is an effort to mention the humanities, but not very much more, although certain areas such as language technology and digital cultural heritage are given more attention. There is also a focus on databases and data. The report states that the “most urgent need for infrastructures in the humanities and social sciences is that of creating better conditions for research using databases and registers” and that a “fundamental aspect of the infrastructure for research in the humanities is access to digital data.” Even including this particular idea of humanities infrastructure, there are typically very few resources allocated to the humanities. Looking at the Swedish Research Council infrastructure grants for 2013, one out of 27 grants was given to the humanities (The Swedish Research Council Project Database). This grant was unsurprisingly given to the Swedish node of CLARIN, which is

a European platform for language technology, and is also clearly labeled as a social sciences project. The same year, incidentally, the Swedish Research Council made a principal decision not to continue to support a number of humanities-based research print journals (*Svenska Dagbladet*, November 15, 2013). There were two principal arguments put forward. First, it was argued that other fields than the humanities and social sciences do not have this kind of support. Second, a comment was made that these journals may actually keep the humanities the same rather than develop them. This example shows the effects of trying to have one template for all disciplines and a failure to provide a strong enough infrastructural encapsulation for the journals.

Humanists are not new to academic infrastructure, and indeed, the history of the humanities is embedded in different kinds of infrastructure. The classical concept of *ars memoria* is related to remembering, and more important, to the understanding and interpretation of materials, and as such, is arguably an example of virtual infrastructure for the humanities. The Mouseion in Alexandria, established in the third century BC, is cited by the European Science Foundation report “Research Infrastructures in the Digital Humanities” as an early example of humanities infrastructure. The university is clearly a major infrastructural platform, whose development is intertwined with the evolvment of the humanities (Grendler 2004). At another level of specificity, the domestic study that emerged in the Italian Renaissance is clearly an infrastructural installation connected to humanistic work (Thornton 1997: 8). Humanists were also early adopters of technologies such as the printing press (Burdick et al. 2012: 4).

The relation between humanities affairs and infrastructure can be nicely illustrated by the seminar, which emerged as an institutional activity in the late eighteenth century and early nineteenth century at European universities but, of course, goes back to the Socratic dialogue. The seminar itself could be seen as a type of infrastructure, although it lacks some of the qualities normally associated with the infrastructure turn. For instance, it does not require massive investments, it is conventionally local and not distributed, and it is normally not described as a way of solving major societal challenges. It might be argued that the seminar room is a fairly low-key form of infrastructure that does not necessarily get acknowledged as such. This does not mean that the seminar as organization, space, technology and key intellectual resource cannot be packaged as academic infrastructure or a humanistiscope. If so, it would probably make sense to stress the increasing reliance on remote participants, broadcasting, and shared digital resources. And why should humanists not have enormous touch visualization tables to manage their disparate and complex materials in a collaborative fashion? Another kind of seminar can be exemplified by platforms such as the HASTAC website, which may be easier to package as infrastructure. Such changes would not be the first ones in the history of the seminar. When the seminars were first introduced at German universities, they challenged the strict hierarchy of education because knowledge rather than status was taken into account (Hansson



2007). It would seem quite unlikely that the seminars removed the hierarchies, but they did change the nature of education and they put pressure on infrastructure. For example, the format was not necessarily compatible with traditional lecture halls, and Hansson makes the point that this is why the seminars often took place in the professor's home at this point in time.

Scholarly work on humanities infrastructures in a contemporary context is rare, although there is substantial work on scholarly publishing, libraries, the tools of the trade, and visualization. However, there is a set of work within critical studies and science and technology studies that is highly relevant to the current topic. Some of this work clearly points to the situatedness of infrastructure. As Lisa Parks (chapter 25 in this volume) argues in her discussion of media infrastructure, infrastructure cannot easily be snapshotted. There is complexity, systematicity, and messiness to infrastructure. And as Jo Guldi (2012) shows in her work on Britain as an infrastructure state, the story of infrastructure is one of tension, politics, skyrocketing expenses, and necessity. Chandra Mukerji's (1997) work demonstrates—in wonderful material detail—how the Gardens of Versailles, under Louis XIV's stewardship, became a material site for representing power structures and imaginary worlds. Shannon Mattern (2013) pointedly argues that the idea of big data in the service of urban development is a problematic concept. She discusses the NYU Applied Urban Science and Informatics initiative (placed in Brooklyn) and notes how the “all-white, all-male leadership team, perched high above Brooklyn's MetroTech” sets out to model cities to come up with new solutions and develop new expertise. Mattern's work reminds us of the important work on categorization done by scholars such as Geoffrey Bowker and Leigh Star. Categories are not just “out there,” but situated constructs. This is not least true of knowledge infrastructures such as metadata systems. An interesting example is presented by Ursula Heise's (2011) work on biodiversity databases, in which she shows how such databases are subjective constructions full of human decisions, cultural preferences, and storytelling.

Any infrastructure has built-in predispositions. For instance, the Web as a platform is tied to the page as a frame, a predominantly one-screen environment (as opposed to multiple-screen environments), and the encoding structures imposed by HTML. The Text Encoding Initiative offers not only a way to annotate and describe mainly textual materials, but as Dino Buzzetti and Jerome McGann (2006) have pointed out, is also itself an interpretation that among other things imposes a hierarchical structure on texts. The underwater network cables that deliver Web content and other data are intertwined with the content, the industries that use them, and the material and political conditions that govern their placement and routing. The traditional classroom supports a structured learning situation with clear teacher and student positions and expectations embedded in a long cultural and social history. Hence instruments and infrastructures always come hand in hand with ways of perceiving, interrogating, and enacting

the world. This is not necessarily a problem and should not keep us from engaging with infrastructure. However, when imagining and implementing humanities infrastructures, we need to incorporate the critical sensibilities that come so naturally when we study other domains.

## A Call for Proposals Investigated: Digging into Data

When a science, technology, engineering, and mathematics (STEM) framework is taken to the humanities and social sciences, there will often be attempts at aligning specific tool sets and technologies with the subject areas in question and the starting point will often be the research material or the technology. For instance, it is expected that because of the assumed access to big data, humanists need to engage with it. An example is a 2013 call for project proposals issued by multiple organizations, including the UK-based Arts and Humanities Research Council (AHRC) and the US-based National Endowment for the Humanities (the following analysis is based on the AHRC document “Digital Transformations in the Arts and Humanities: Big Data Research. Call for proposals”). The excerpt below is a description of projects in the most costly funding strand followed by a general comment on what is expected of projects:

Projects submitted under this strand would need to take a more in-depth approach to their proposed research. They could possibly include visualisations and analysis of big data, creation of new tools and workflows for big data, the assessment of use of high performance computers, creation of artworks and other objects with big data, and may generate new big data. These projects may involve greater collaboration with both academic and non-academic partners and within or between disciplines.

The aim of both strands is to produce innovative, collaborative projects that add value to the digital transformations theme, can potentially have a big impact in the arts and humanities, and raise enthusiasm about the potential of big data to facilitate and support innovative research in the arts and humanities.

On the one hand, this call is quite attractive in that it is open-ended, encourages exploratory work, and seeks to innovate research in the arts and humanities. It is not unlikely that the call may result in some high-quality research projects, and I would be delighted if the Swedish Research Council dared to propose calls of this type. On the other hand, though, there seems to be little substance to the conceptual foundation articulated in the call and the guidance document. There simply does not appear to be an intellectual rationale for why this investment would lead to innovative research or why it is important in the first place. Why do such projects potentially have a big impact? The expectations in relation to the more expensive projects (up to £600,000) as described in the text above seem almost naïve, and there is little focus on the scholarly challenges or a deep conceptual rationale.

Furthermore the call is clearly based on a science model, and the first paragraph of the “Digital Transformations in the Arts and Humanities: Big Data Research. Call for proposals” document, states that some of the most known examples of use of big data come from the sciences. The call cites statistics from the Large Hadron Collider, which is said to produce 15 petabytes of data every year, and points out that a grid consisting of 140 centers in more than 35 countries is used to analyze these data. There is, however, very little discussion of what the collider actually does in terms of facilitating research or tackling research challenges. Corresponding numbers are given for other, humanities-like data sets. The George W. Bush email archive, for instance, consists of 200 million emails (equaling 80 terabytes). It is somewhat troubling that there is no discussion in the call of the perceived objectivity of data or relevant work done in science and technology studies on data. Lisa Gitelman and Virginia Jackson (2013: 4) remind us that objectivity, as situated and historically specific, is the result of “conditions of inquiry, conditions that are at once material, social, and ethical.” While it is important to encourage exploratory work and to engage with technology, it seems that the call has significant weaknesses that come from a combination of starting out with the material (generic data), assuming a science model (through a humanities lens), not focusing on research challenges and not incorporating the critical modality that we associate with the humanities. Some of these alleged weaknesses can be explained by the realpolitik of a complex institutional setup across funding agencies and countries and by the attempt to encompass both the humanities and social sciences. Nevertheless, this is where the digital humanities and the humanities more generally should be involved in discussions with funding agencies, and making sure to connect scholarly needs and perspectives with infrastructure.

## Academic Infrastructure

Whatever we imagine humanities academic infrastructure to be, we will have to relate to the notion of infrastructure established by the policy makers, funding agencies, and institutions of higher education. I will now discuss this sense of infrastructure and look at some of the assumptions built into the institutional sense of infrastructure.

One assumption is that infrastructure is primarily for research. Research infrastructure, cyberinfrastructure, knowledge infrastructure, and e-science are concepts normally associated with research and particularly science-based research. I use the alternative term academic infrastructure to emphasize that I see infrastructure more broadly. If we believe that education and research are intrinsically connected, we need to think about how infrastructure can serve both needs. This does not apply equally for all infrastructure, of course, but is an important overall sentiment, and something that the humanities should take care to point out

when discussing infrastructure. After all, if we look at a key example of humanities infrastructure, the library, it serves both education and research.

Another assumption is that it makes sense to coordinate research infrastructures nationally and internationally. The rationale for this is partly economic. It takes massive resources to fund infrastructure and there is an interest in not duplicating resources unnecessarily. This is not just a question of technological platforms, it also has to do with competence and reaching critical mass. Furthermore coordinated efforts are seen as a way of maximizing the use of expensive equipment, as can be seen in the following EU description (“The European Landscape”):

Adequate research infrastructures are essential in promoting technological innovation, as they provide the conditions and critical mass required to carry out cutting-edge research. New scientific and technical challenges call for increased performance of research facilities and better knowledge exchange between different disciplines. This increase in capacity and performance can, in part, be achieved through better coordination of existing facilities and the development of simple operational mechanisms. In addition, funding the design and construction of new infrastructures affects the direction of research for many years afterwards.

This text also exemplifies some other key assumptions. Beyond the already discussed notion that research infrastructure relates to science and engineering, it is clear that infrastructure is expected to be expensive, to be used beyond single research groups, and to typically have considerable longevity. Moreover there is an expectation that progress will be made at the intersection of different disciplines and areas, and that infrastructure thus depends on being in between to help facilitate intersectional work. Typically the text also points to how infrastructure is necessary for innovation, producing world-class work and for meeting key challenges. In some ways, infrastructure represents national and pan-national dreams.

If we go back to the examples of research infrastructures listed by ESFRI and discussed earlier, these point to another important assumption about infrastructure. Radiation sources, environmental sciences observatories, imaging systems, genomic data banks, and clean rooms all have a sense of discreteness and unity to them. Infrastructure, in this sense, consists of material installations or platforms that can be described by a name or a phrase. Such platforms are not “given,” but the product of packaging and strategic framing as well as function. Arguably, the humanities need to engage with infrastructure on the level of packaging.

## Infrastructural Templates

Institutional assumptions about infrastructure as well as our own infrastructural past and our sense of the humanities shape contemporary ideas about humanities infrastructure. This means that humanities infrastructure, as envisioned inside and outside the humanities, relates

to certain templates, and I will briefly look at two such templates in this section: a science and engineering model and using existing infrastructure, such as libraries, as a model.

As the earlier discussion of the “Digging for Data” call for proposals demonstrates, there is a strong tendency to relate to and adapt to a scientific and engineering paradigm when conceptualizing humanities infrastructure. Not only are science infrastructure and data sets used as examples, but the call in question draws heavily on ideas associated with science, technology, and engineering, such as big data, instrumentation, and visualization. Another example of this type of alignment is provided by a report from the American Council of Learned Societies (Unsworth et al. 2006):

Humanities scholars and social scientists will require similar facilities but, obviously, not exactly the same ones: “grids of computational centers” are needed in the humanities and social sciences, but they will have to be staffed with different kinds of subject-area experts; comprehensive and well-curated libraries of digital objects will certainly be needed, but the objects themselves will be different from those used in the sciences; software toolkits for projects involving data-mining and data-visualization could be shared across the sciences, humanities, and social sciences, but only up to the point where the nature of the data begins to shape the nature of the tools. Science and engineering have made great strides in using information technology to understand and shape the world around us. This report is focused on how these same technologies could help advance the study and interpretation of the vastly more messy and idiosyncratic realm of human experience.

There is a clear risk here of adopting a science and engineering based model for humanities infrastructure in such a way that the model significantly constrains and shapes possible research enterprises and directions. Hence it is assumed that much of the structure of infrastructure will be the same, including the technologies, although the objects used by the humanities will be different from the sciences. There is also an assumption in the text excerpt that the objects are static and restricted to specific knowledge domains. However, as Jonathan Sterne points out, “disciplines never fully constitute their objects; they fight over them” (Sterne 2005: 251). Sterne argues that these fights are partly what make disciplines maintain their intellectual vibrancy.

Another relevant question is whether it is at all possible to discern a point like the one referred to by the statement: “only up to the point where the nature of the data begins to shape the nature of the tools.” It could be argued that it is naïve to think that there is such a point and that that shaping starts even before one actually starts to use the tool. Geoffrey Bowker argues that databases should be read both materially and discursively as sites of technical, political and ethical work, and that there “can be no a priori attribution of a given question to the technical or the political realms” (Bowker 2005: 123). Furthermore, just like the “Digging for Data” call, the ACLS report advocates a notion of infrastructure very much concerned with data and

incorporating as much data as possible. Humanities infrastructure can certainly be about big data, also immensely large data sets, but the science and engineering template seems to strongly suggest a privileging of large data sets in the humanities without adopting a critical perspective and awareness. In her work on data fetishism, Shannon Mattern points to how complex phenomena are reduced to data in an automated fashion, and how these data get reified through visualization and other means. Her position contrasts distinctly with infrastructural visions such as the ACLS report, not least in emphasizing the taintedness of data and associated processes:

If we gather lots of (mostly well-educated, male) programmers, armed with expensive machinery, and put them in a room with a tank of coffee, their version of “social change” will almost always involve finding the right open data set and hacking the crap out of it. Not only does the hackathon reify the dataset, but the whole form of such events—which emphasize efficiency and presume that the end result, regardless of the challenge at hand, will be an app or another software product—upholds the algorithmic ethos. (Mattern 2013: <https://placesjournal.org/article/methodolatriy-and-the-art-of-measure/>)

This is the kind of critical awareness that the humanities need to incorporate into its thinking about humanities infrastructure. For instance, the central role played by the visual in many infrastructural installations must be addressed critically and practically not only in terms of particular installations and current visual predominance, but also in the long-term cultural and historical perspective. Who can do this better than the humanities? And how do we best incorporate critical work along the lines of Mattern’s analysis of hackathons to the digital humanities investment in THATcamps and maker labs?

Another important model for humanities infrastructure is existing infrastructure, in particular, libraries and memory institutions. It is clearly evident in the American Council of Learned Societies report “Our Cultural Commonwealth”:

The infrastructure of scholarship was built over centuries. It includes diverse collections of primary sources in libraries, archives, and museums; the bibliographies, searching aids, citation systems, and concordances that make that information retrievable; the standards that are embodied in cataloging and classification systems; the journals and university presses that distribute the information; and the editors, librarians, archivists, and curators who link the operation of this structure to the scholars who use it. All of these elements have extensions or analogues in cyberinfrastructure, at least in the cyberinfrastructure that is required for humanities and social sciences.

While this is probably a fairly valid description of existing infrastructure, it largely leaves out infrastructures outside of libraries, archives, museums, and publication systems. Also it accentuates certain aspects of such institutions and systems. For instance, the library as a situated place for knowledge production is not given any attention.



Thus we are concerned with a library and collection-based model, which admittedly is well in line with a large part of the humanities. It is important to realize, however, that there is a set of epistemic commitments associated with this model—pertaining to structure, delivery, material types, retrieval systems, selection procedures, the relation between researchers and library institution, and other issues basic to the humanities—and that any major new investment in academic infrastructure should not uncritically be based on such existing structures and descriptions. For instance, it would seem that the model presented above makes a fairly strong delineation between the collections (institutions, distribution systems, professional functions involved, etc.) and the researchers and the research community. Johanna Drucker addresses such delineations critically stating, “modelling scholarship is an intellectual challenge, not a technical one. I cannot say this strongly or clearly enough” (Drucker 2009a). In contrast to much of the discourse of academic infrastructure and digital humanities, Drucker importantly focuses on the scholarly challenge and not on the technology or technology-induced visions. And although her point is valid, the challenge is of course both intellectual and technological, especially if we believe that the humanities need to create humanities infrastructure.

## The Humanistiscope Revisited

The humanistiscope is a rhetorical device that can help us conceptualize and create humanities infrastructure that meets the combined intellectual and technological challenge referenced above. Needless to say, the idea of the humanistiscope is not an all-in-one-solution, but rather, a tool to help us think about and enact humanities infrastructure. In the sciences the notion of platforms is often used in a similar way, but as we will see, the suggested neologism offers more precision. Platforms tend to refer to set of instruments rather than a single apparatus and notions such as apparatus and instrument already come with much meaning. In any case, I argue that the humanistiscope can push against the humanities in productive ways. The common sensibility that science instruments are materially and conceptually defined can be used to push the humanities to think about their infrastructure in terms of material, technological, and spatial situatedness. At the same time, the humanistiscope as a thought piece can make it easier for the humanities to draw on their own critical work on instruments and apparatuses, notably in science and technology studies, in order to push against their own imagined and implemented infrastructures. Such critical work often stresses the cultural, social, and political situatedness of infrastructure.

Importantly, the humanistiscope should not be seen as independent of current discourse on research infrastructure, but rather, it offers a humanities-based way of productively aligning with and tweaking such discourses. This means that there will necessarily be a relation to

national and international research policies and agendas. The point is not to oppose these generically, but rather, to articulate infrastructural models that are built on humanities-based needs and challenges. I will now use an extended example to illustrate some of these points and to discuss what makes a humanistiscope.

During a medievalist conference at the Faculty of Arts at Umeå University in the spring of 2013, a few sessions took place in HUMLab, a digital humanities studio. It turned out that the visual capabilities of the lab environment were quite useful compared with the traditional lecture halls in the humanities building (with relatively small, single, and upfront screens). Research infrastructure was also discussed during the session and, in particular, after one of the presentations. This lecture described a project that made use of a number of discreet screens organized around the space (a screen scape) to enact a pre-print experience of church spaces in relation to the Virgin Mary as a virtuous role model in medieval Sweden (Lindhé, chapter 14 in this volume). One question that came up several times concerned the portability of the installation. When would it be available on the Web? While this is a relevant question, it also demonstrates a lack of awareness of the situatedness of infrastructure. This particular installation was heavily grounded in the particular physical and digital infrastructure of HUMLab, and it cannot foreseeably be moved to a Web environment. Aspects of the installation could certainly be transferred, but that would result in a different sensory experience and knowledge infrastructure. This example points to a tendency to think about infrastructure as placeless, immaterial, and neutral in the humanities. For example, the Web is usually a default platform for digital humanities projects, but there is little critical discussion of the material constraints and conditions associated with this platform and other platforms are rarely considered.

The history of instrumentation has a clear material component, and the humanistiscope borrows a material sensibility from its science counterparts, such as microscopes and sonoscopes, which can help give humanities infrastructure a material and conceptual definition. There arguably has to be a certain degree of configuration and unity to infrastructure. If there are many parts and components, these can be incorporated as long as the heterogeneity is not foregrounded discursively at the expense of the integrity and unity of the infrastructure. Indeed having a fairly discrete definition would seem to be a useful criterion for categorizing something as a humanistiscope. This adds a certain degree of conceptual and material precision, and as such may help the humanities to be both more intellectual and material about their infrastructures and avoid some of the airiness of much of infrastructural discourse. Importantly, building infrastructure is not just a matter of starting out with an intellectual foundation and finding or making infrastructure to implement it (or vice versa), but rather, it is an iterative process. Infrastructure is intellectual, in this sense, and it will shape and condition the research that engages with it.

The preceding discussion and the earlier example of the medievalist conference point to another criterion for humanistiscopes, namely that they cannot be too specific or too general in terms of function. It would not be possible to have one humanistiscope that covers most research needs in all the humanities disciplines. This piece of instrumentation would be a black box and would not be materially and conceptually well defined. However, humanistiscopes must not be too specific or they do not have the applicability and range that we would associate with infrastructure. This is the case with the Virgin Mary installation as it is restricted to one project and associated research questions. It would seem to have too little generalizability to qualify as a humanistiscope in itself. The screen scape, on the other hand, can be used with multiple projects and has a considerably wider range. It also has specificity through having an ideational and material basis. The principal conceptual basis of the screen scape is to allow interrogation of complex cultural and historical matters through multiplex visualization and enactment. In some ways the screen scape challenges predominant visualization infrastructures for science and technology, where there tends to be a focus on immersive environments such as CAVEs as well as very large and uniform display walls (Svensson 2011). There is a humanistic sensibility in the conceptual basis, but also in the way the screen scape has been put together and the underlying technological systems. And beyond the technology, one of the most important parts of the installation is the centrally placed seminar table.

The materiality of infrastructure can naturally be both physical and digital. The screen scape has a strong physical presence but is also digital, whereas an online retrieval system may be mostly digital. Let me now use another example to discuss a mostly digital humanistiscope. Again, I draw on a project based at HUMLab at Umeå University.

The faceted browsing system was developed in a European Union funded project begun in 1997. It was created to manage specific archival data sets and their ontologies, but it came to be expanded over time. In essence, the system allows navigation of rich and complex data sets through selecting and defining facets. These facets determine what will be produced in terms of tables and visualizations in a data view window. Materials can be searched and delimited through the actual data view too and, for instance, map-based navigation can be used to filter data. The facets are shown through small windows or applets in the browser. The basic idea is simple and powerful, and the system has come to be used with many other funded projects and has continued to be developed over time. While it might not have been generic enough to start with, the system would now seem to be a good candidate for being called a humanistiscope. It has a material definition through the Web application and it has a conceptual basis. It is not tied to an individual data set or project anymore, and it is not an all-in-one generic solution.

## Beyond a Single Humanistiscope

There is not merely one humanistiscope, but many. And they can be interrelated. For instance, in 2013, HUMLab finished installing a large floor screen and an adjacent triptych screen (a screen with a large central part and two slanting side parts). The triptych screen draws on a long history of triptychs and configurations of three, and the floor screen challenges conventional orientation and placement of screens. The screens are placed on the Umeå Arts Campus, and this situatedness plays an important factor. The exact position, inside a massive glass wall with high visibility for the whole Arts Campus, is meaningful. While the two screens and associated sensing and interaction technology can be used separately, it would seem to make sense to consider both as one humanistiscope in most cases. They complement each other, and are close enough to be read visually and conceptually as one unit.

Mostly physical infrastructure, such as floor and triptych screens, can also be combined with mostly digital humanistiscopes. The faceted browsing system discussed above has always been a Web application, but in the fall of 2013, it was deployed on the floor-triptych humanistiscope. The idea was that a Web browser client imposes a number of constraints, one of which being that normally content is displayed across only one screen. In the new iteration, the content (data windows) can be shown on the floor screen, while the facets are shown on the triptych screen. Since a very commonly used data view in the system is cartographic visualization, the floor screen seems quite suitable as we often look at maps from above. The triptych screen is used for the facets, and active facets are shown centrally on the screen, while inactive facets are shown in the periphery (using the slanted side screens). In this way we have two humanistiscopes, one mostly physical and one mostly digital, interacting.

Unless the humanities come up with individual humanistiscopes of very large reach and critical mass in terms of researchers, it is likely that there will be a number of separate humanistiscopes. In the sciences these are sometimes subsumed under a platform or a laboratory. I suggest that a particularity of humanities infrastructure is that it is likely to be multiplex to accommodate different scholarly and educational needs. Major science infrastructure, in contrast, tends to be seen as more specific in terms of relating to certain projects, questions, or even certain problems. This may be an issue of scale in the sense of the sciences having a much larger infrastructural and operational footprint, but it may also be a matter of the nature of humanistic issues and endeavors. The humanities deal with ambiguity, complexity, layering, theorizing, and a wealth of perspectives. While a science-oriented infrastructure such as the immersive CAVE is generic, it would seem to be built around a set worldview, one that is not normally problematized and that does not easily lend itself to the theorization of the very premises of the infrastructure.



The humanistiscope can help us package things together, but only up to a certain point. In some cases we also need a larger configuration that allows the bringing together of different humanistiscopes. In the same HUMlab space as the triptych and floors screens, there is also a portal room that allows multiple-party Skype meetings and wall-based visualizations. This is also a humanistiscope, and it would not make much sense to group it too tightly with the other screens. It has its own conceptual grounding and function. This does not mean, however, that these humanistiscopes are unrelated. They are part of the same platform or set of co-aligned humanistiscopes, and the rationale for bringing them together is not least related to management of resources. Just like in the sciences it is important to maximize the use and accessibility of infrastructural resources, have a professional organization around them, and allow for crossover effects.

There are many models for accomplishing this clustering of humanistiscopes, including network organizations, lab environments, and open access platforms, and I will end this chapter by briefly considering the humanities lab or digital humanities lab as such a model. A digital humanities lab or studio would seem too large and heterogeneous to be seen as a single humanistiscope. It can usefully bring together humanistiscopes, competence, scholars (inside and outside the humanities), networks, and an investment in the humanities and the academy. Most labs are seen as physical installations, although they are digital as well. It is quite possible to imagine mostly digital humanities labs, but there is also value in the physical situatedness of physical installations. For one thing, such installations allow both physical and digital humanistiscopes to coexist in the same operation. Such infrastructures can make other things possible, not least, such things that do not work well within current, distributed infrastructures. Localized infrastructure can also be worthwhile at a time when we see increased digitalization of higher education and a distinct pressure on space. It is also a good use of space and a way of increasing the attraction of the physical campus. The website for a new Swedish and European infrastructure, the European Spallation Source (ESS), states “[e]ach year an estimated two to three thousand visiting scientists will come to ESS to perform experiments.” Moreover having a lab can be useful in other ways. It can be a place and culture for people and dialogue, house a number of different humanistiscopes (different methodologies and tools), integrate those as well as seminar tables, exhibition space, studio space, and so forth, and allow for multiple points of interaction and for making and critical work (essential to digital humanities). Additionally a digital humanities lab can enable and facilitate new research and challenge the disciplines, manifest the operation (be somewhere to take people and to channel resources), have strong technological engagement, and push technological imagination; it can develop the humanities (knowledge production, work modalities, making, and reaching out), and it can manifest the university as a place for dialogue, intellectual rigor, excitement, and reaching out.

Luckily, the question of humanities infrastructure is not an either-or question, and we will continue to have a mix of different models. What is most important is to connect infrastructures to ideas about the humanities and what intellectual challenges we want to tackle. Infrastructure is a question of social, cultural, and political situatedness as well as a question of material and conceptual situatedness. I have argued that a device such as the humanistiscope can help us do the job. Instead of infrastructure to preserve traditional modes or a wholesale adaptation of infrastructures produced for other communities, we might invite a more nuanced, complex, kind of treatment in order to help us dream up all kinds of yet unseen things for which we are the core.

## Note

The humanistiscope as an idea for this chapter came up in my discussions with Erica Robles-Anderson in 2012.