

3 e-Research as Intervention

Anne Beaulieu and Paul Wouters

INTRODUCTION

New research tools, be they digital libraries or digital work environments, are usually seen as means to support and further develop research. This also holds for the relatively recent investments in cyberinfrastructures for research in the U.S. and the e-science program in the U.K. (Atkins et al., 2003; Berman, Fox, & Hey, 2003; Hey & Trefethen, 2002). The hope is that it will be possible to create powerful “Virtual Research Environments”, “consisting of a set of sophisticated tools and technologies that will ease the extraction of information from data, and of knowledge from information” (Hey, 2006: vii). By working in these new information environments, researchers should become more productive and better able to cope with interdisciplinary problems. Physics, astronomy, and the life sciences have been at the forefront of e-science, but e-science is increasingly seen by some actors as relevant to the social sciences and humanities as well. The series of conferences on e-social science that started in 2005 in Manchester, within the framework of the UK e-science program, is an interesting example of this development.¹

In this chapter, we focus on this new development by discussing an initiative to analyze and support e-research in the humanities and social sciences in the Netherlands, which officially started on 1 January 2006: the Virtual Knowledge Studio for the Humanities and Social Sciences, funded by the Royal Netherlands Academy of Arts and Sciences.² We are ourselves involved in this project and our discussion can be read as an exercise in prospective reflexivity: an attempt to analyze the tensions we are experiencing and expect for the next few years.

We also hope to contribute to the discourse in social science about the different ways to cope productively with the tension between engagement and distance as attitudes and practices in research. This is a long-running debate, and in itself the development of e-research practices does not immediately change the parameters of the debate. It does raise, however, new forms in which this tension materializes and is being played out. We will discuss some of the most salient of these novel forms and

indicate how we wish to deal with them in the framework of the Virtual Knowledge Studio (VKS).

In short, the chapter has a double goal. First, we wish to contribute to e-research by seeing e-research as a specific, historically situated, set of interventions in existing practices in the social sciences and humanities. Second, we wish to contribute to the methodological, political and epistemological debate in the social sciences, by drawing the implications of e-research for the old tension between being engaged as social researcher or alternatively remaining at a distance from one’s object of study and from the implications of studying it.

E-SCIENCE VERSUS E-RESEARCH

We would like to begin with a distinction between e-science and e-research. Terminology is not innocent and the differences in the integration of cyberinfrastructures and tools in scholarly dominant use of the term e-science in discussions of new information infrastructures for the humanities and social sciences carries with it an emphasis on data-oriented, computational, or quantitative analysis (Wouters & Beaulieu 2006). We propose to use the term e-research instead. This term is more inclusive of a variety of research modes, and thereby acknowledges disciplinary practices (Fry, 2006; Kling & McKim, 2000).

e-Science, termed cyberinfrastructure in the US,³ is generally defined as the combination of three different developments: the sharing of computational resources, distributed access to massive datasets, and the use of digital platforms for collaboration and communication. The core idea of e-science is that knowledge production will be enhanced by the combination of pooled human expertise, data and sources, and computational and visualization tools. e-Science has become a buzzword for funding large-scale facilities in research fields driven large-scale data processing. It claims to be no less than a revolution in the way knowledge can be created (CSTB, 1999). This development started in the US at the end of the 1990s in the framework of super-computer centers (Vann & Bowker, 2006). It was picked up in the UK in 2001, when an ‘e-science’ research program was launched, with funding of 250 million pounds for a period of 5 years (Hey, 2006). The Grid technology developed by computer scientists working in particle physics settings played an important role for e-science. In the framework of their research, it was important to go from sharing information (via the Internet) to sharing computation (via the Grid), turning “the global network of computers into one vast computational resource” (Grid Café, no year). The idea then took the shape of a generic computational infrastructure for scientific research. The domains that are supposed to be affected by this revolution vary according to the national variety of e-science. But, so the claim goes, almost all disciplines will be transformed in some way or other.

We have discussed elsewhere the tension this has created between e-science as a generic novel paradigm of research and its practice as a local infrastructure in a limited set of fields (Wouters & Beaulieu, 2006). This led us to a plea for forms of non-computational e-science, and for the use of e-research as the more inclusive term. e-Research acknowledges forms of research that are not reliant on high-performance computing, as well as other ways of making use of new media and digital networks. Email and Web sites, used by hundreds of thousands of scholars may have more import than a Grid application used by a few hundred.

As far as we know, the term e-research in a methodological sense was used first by Terry Anderson and Heather Kanuka in 2002 (Anderson & Kanuka, 2002). In their research manual addressed to researchers in the field of education, they define e-research basically as 'Net research'. It includes online surveys and interviews, log file analysis, analysis of social behavior in virtual reality environments and online evaluation of knowledge. Their use of the term e-research is very close to Christine Hine's use of the term virtual methods (Hine, 2005) or the term Internet Research by a growing group of social and humanities scholars, in particular the group organized in the Association of Internet Researchers AoIR (www.air.org) (Jankowski, Jones, Lievrouw, & Hampton, 2004).

Since 2004, we have used e-research differently,⁴ as a critique of the notion of e-science rather than as a generic word for Internet research or virtual methods (Wouters, 2004). Our critique addresses three different aspects of e-science: the underlying philosophy of science, assumptions about diffusion of e-science across academia, and expectations about the technological infrastructure needed.

First of all, in contrast to the implied philosophy of science in most e-science writing, we wish to celebrate rather than diminish the pluriformity that exists in academia. We do not expect that making clever use of ICT will in itself make the social sciences or humanities 'harder' or more like experimental science. Nor should it: our use of e-research is both descriptive and performative. Our second point of critique addresses the assumption that e-science is supposed to diffuse across academia. With respect to the diffusion model, we emphasize that if more fields make use of ICT, this will not be a simple wholesale adoption. Rather, we foresee an active transformation, in which the models of research prevalent in the relevant field shape the way ICT is conceptualized and used. Rather than a *diffusion* of e-science, we propose to think along the lines of *translation* of e-research. The implication is that it is not a matter of simply setting up a proper Grid infrastructure, and then expecting that users will flock to it and become e-scientists. A translation model of e-research posits a different dynamic between tools and users, where mutual shaping and adaptation takes place, and where what 'e-science' can mean as a practice is also subject to transformation.

This leads to the third element of our critique: which technologies are actually needed by scholars in a variety of fields? Or perhaps more precisely,

which technologies could support and enhance research practices in a given field? Very often, researchers will not need a Grid—nor whatever paradigm comes next in computer science. They may be more interested in some rather 'low-level' technology like better email applications—robust and portable rather than cutting edge—which may not be very exciting for computer scientists, but may be far more helpful to advance the field in question.

Our critique implies a particular stance, and this too has implications for the kind of work supported. This user-oriented perspective may lead to conservatism, since it emphasizes a business-as-usual focus. By making the user so central, we run the risk of undermining the dynamic of innovation that can be coupled to initiatives like e-science. In this respect we are on the side of some of the champions of e-science, in that we also feel that it should be possible to play more creatively with both concepts and technologies in many fields in the social sciences and humanities than is currently the case. We think this type of innovation of epistemic cultures (Knorr-Cetina, 1999) will always need to start from the position of a group of researchers in a particular field and the creation of room and support for activities that explicitly involve exploration and experimentation,⁵ however, rather than with a technology looking for users. This forces us to play a rather complicated game in which we both promote innovation in academia and are suspicious of the innovation talk that comes with it. We expand on how we are dealing with these tensions later in this chapter.

On this issue of e-research, let us finally note that the term seems to have become far more widespread recently. This is partly due to discussions at the series of international conferences on e-social science, and partly due to the creative activities in 'digital humanities'. The Oxford e-research Centre has also taken up the term, and shifted from the use of e-science to e-research to designate their new research program. This development reached a high point in 2007 at the Third International Conference of e-Social Science in Ann Arbor, where the former director of the UK e-science program Tony Hey explicitly noted the restrictive character of the label e-science, and affirmed that in the social sciences, e-research would be a much better term instead (Hey, 2007).

E-RESEARCH AS INTERVENTION

We conceptualize the development of e-research in the humanities and social sciences as an intervention in the practice of knowledge creation. The drive to create new modes of knowledge generation that is dependent on, and mediated by, high-performance computing networks has usually not been the result of the autonomous development of the field in question, but rather of interactions. For example, cell biologists did not accidentally hit upon the idea of simulating a living cell in a three-dimensional graphical immersive environment. Rather, this resulted from interaction with

computer scientists involved in the creation of virtual reality environments and of visualizations (Lenoir, 1998), initially mainly funded by DARPA (Sutherland, 1968), leading to projects such as the Virtual Cell.⁶

Coalitions are therefore created around advanced research instrumentation. Funding schemes, tools, researchers, institutional frameworks and research agendas interact to form these coalitions. Presently, we are witnessing the emergence of this type of interaction in the social sciences and humanities. The result of these interactions can perhaps best be characterized as a parade of prototypes, applications developed within the framework of a particular project but aimed at broader area of scholarly communities. For example, papers presented at the First International Conference of e-Social Science in 2005 in Manchester showed ways to put social science applications on the Grid (Crouchley et al., 2005), a spatial decision support system (Birkin & McFarland, 2005), tools for distributed data analysis (Fraser et al., 2005), modeling and simulation environments (Birkin & MacFarland, 2005) and a prototype for networking social science resources on the Web (Schumann et al., 2005). It is not yet clear to what extent these prototypes will survive their initial period of funding and contribute substantively to social science research. If other researchers do not use them, this may simply be because they are not sufficiently relevant to the field, or even invisible to the core group of experts in the field. It may also be that certain kinds of actors, such as large firms and professional software developers need to be involved in these coalitions, because of their ability to shape availability and usability of tools.⁷

In all these cases, it may be fruitful to conceptualize e-research as an intervention in current practices, potentially upsetting these practices and disrupting the existing fabric of social relationships that carry knowledge creation. This conceptualization also emphasizes the recognition of theoretical and methodological pluriformity we attach to the term e-research. By seeing e-research as intervention, we not only underline that translation work is needed if e-research is to be adopted in new fields, but also that this has a cost. It is not only a matter of spreading the wealth around; it is also a matter of redirecting and thereby upsetting research agendas.

Conceptualizing e-research as intervention, we make visible the complexities of the work involved and the difficulties in prospective evaluation of its possible outcomes. It is not enough to weigh the costs and benefits of one research agenda over the other. It is also relevant to acknowledge the fact that e-research as intervention needs to be understood in sociological as well as epistemological terms. We need to step back from involvement in the culture of a particular field to be able to see these intricacies. This is why we find the expertise developed in the field of science and technology studies especially useful. Because our primary accountability as scholars is not in the particular field being investigated, this provides a relative distance from its dominant paradigms. We thereby have a degree of freedom to engage in experiment and play with new forms of research that may be

enabled in e-research, and to reflect on the consequences. This leads, of course, to an immediate new involvement in that field, opening a virtuous cycle of engagement and disengagement. This cycle can only be sustained on the basis of a theory about innovation in a particular field that is partly independent of the state of affairs in that field. For example, in one of our projects at the VKS, we work together with economic historians to create a collaboratory for their research. In order to understand the problems historians may encounter in switching to mediated and large-scale forms of collaboration, we can draw on experiences in other fields. We therefore need to draw upon knowledge such as developed in the "science of collaboratories"⁸, while maintaining an analytic standpoint that remains aware of the particularities of economic history. In other words, having a conceptual framework to understand the dynamics of knowledge production enables a different appreciation of new practices around new tools. The field of science and technology studies has not only developed well-honed theories and methodologies to understand these dynamics, but has also thought hard about the balance between engagement and distance.

INTERVENTION AS CONCERN FOR SOCIAL SCIENCE

In order to reflect on intervention, we draw on the body of work on intervention in STS and on the STS scholarship on the "dynamics of expectations" (Brown, 2003; Brown & Michael, 2003). We are especially interested in how it is possible to combine critical analysis with design-oriented research in the context of analyzing and creating e-research practices and infrastructures (Hine, 2006a). This is not a new question, and earlier generations of researchers in science and technology studies have dealt with it. More recently, in the U.K. and the U.S., STS has partly moved to new academic environments in such innovative directions as business schools (Coopmans, Neyland, & Woolgar, 2004), where intervention seems a given of the institutional context.

According to Gibbons and colleagues (Gibbons, Limoges, & Nowotny, 1994), a new mode of knowledge production has emerged in the past decades in which basic research has become intimately intertwined with contexts of application. The mode 2 thesis has been criticized because it tends to lump unrelated phenomena together, underestimates the extent to which mode 2 science was dominant in the past (for example in chemistry), and tends to present the emergence of new accountability regimes as inevitable and politically neutral (Rip, 2002a, 2002b; Shinn, 2002). This critique is even more relevant if we study the shifting contexts of STS research itself. But, as Coopmans and colleagues note, a key question remains for whom is engagement a form of progress (Coopmans et al., 2004: 6).

In a recent issue of *Science as Culture* (Zuiderent-Jerak & Jensen, 2007) and in other publications, the problem of interventionist science and

technology studies has been explored in relation to the tradition of action research and to the normative implications of social research (Callon & Rabeharisoa, 2008; Chilvers, 2008; Lengwiler, 2008; Stirling, 2008).

To sum up these brief reflections (which are expanded on the Web site accompanying this book), our starting point is that intervention oriented STS may present many issues that may feel 'new', especially if one is newly dependent on research funding—where many schemes demand that attention be paid to added value, to social relevance and other forms of intervention—but that can also be constituted as an opportunity for reflection and better interventions. We think these problems are relevant along three dimensions: theoretical, methodological, and political. We wish to explore these dimensions on the basis of the Virtual Knowledge Studio for the Humanities and Social Sciences (Wouters, 2004).

HOPE AND INTERVENTION AROUND THE VIRTUAL KNOWLEDGE STUDIO

The promise of the new and the promise of intervention are closely entwined in the case of the Studio, and in this section we attempt to show the mutual shaping of particular hopes regarding new technologies and changing research practices. New technologies, in this case, information and communication technologies carry a particular set of hopes about increased efficiency, relevance or novelty (Hine, 2006b). Funding bodies also foster particular hopes about doing something for a particular constituency. Indeed, by the time funding is on offer, what this 'something' should be is already partly shaped. Expectations are constitutive, and like hype, they "mobilize the future into the present" (Brown, 2003: 6).

In May 2004, the KNAW issued an international call for a program leader in the area of e-science for the humanities. This call was based on the notion that it should be possible both to support 'e-science initiatives' in the humanities and social sciences and to critically analyze them. This can be seen as the result of a debate of a few years in which scholarly insights from STS were mobilized in the framework of Academy research policy (Bijker et al., 2003). However, the idea that technology may drive new scholarly developments is also prominent in the call: "Potentially e-science can have a profound influence on research, the questions researchers ask and the way research is carried out" (KNAW, 2004: 2). A particular kind of hope for what ICT could do for the humanities was therefore embedded in the call, using the language of impact, of newness, of overcoming difficulties via technology. At the same time, the call maintained that both analytic and contributory work should happen under the auspices of the program.

The successful proposal in this procedure was written by one of us (Wouters, 2004) and forms the basis for a new KNAW program, The Virtual Knowledge Studio for the Humanities and Social Sciences. It aims to

support researchers in the humanities and social sciences in the Netherlands in the creation of new scholarly practices, as well as in their reflection on e-research in relation to the development of their fields. A core feature of the VKS is the integration of design and analysis in a close cooperation between social scientists, humanities researchers, information technology experts and information scientists. This integrated approach provides insight in the way e-research can contribute to new research questions and methods in the humanities and social sciences. Importantly, the program entails a subtly different formulation of the "problem of e-science in the humanities and social sciences". It thereby effects a shift that can be seen as a first concrete intervention, not only at both institutional and organizational levels at which the future of the program is being decided, but also in the way the Studio presents itself to the researchers in the fields where it is mandated to intervene.

The program shifts the notion of e-science, as electronic science, towards the notion of *e* for 'enhanced', and towards a more general (though still normative) notion of 'e-research' rather than e-science. These shifts create a space for interventions, where 'e' is decoupled from a particular type of technology (which is evoked by the *e* for electronic). Second, the shift from 'science' to 'research' establishes the Studio as recognizing the particularities and specificities of the humanities and social sciences (Bijker & Peperkamp, 2002; Boonstra, Breure, & Doorn, 2004; Kircz 2004). As discussed above, this formulation aims to turn threat into promise, and aligns the proposal with social sciences and humanities, in the face of the e-science movement.

By showing awareness of the limitations of particular e-science promises, and sensitivity to the ways in which the humanities are particular, we hope the program can become a solid basis for humanities researchers. The promise is one of support in reaping the benefits of ICT, without having to conform to what is articulated in e-science dreams of physicists. In this way, identifying the hype may perhaps help develop other hopes. The moral valence of the Studio's intervention may seem grounded in contrast to inflated promises, and to provide more localized, context-sensitive stories of potential benefit, thereby profiting from what might be seen as 'the hype' in other areas. The VKS program becomes one of the sites where actors come to share a belief in the promise of interventions. If this is successful, they share not only expectations, but also obligations. These relations between funders, researchers and those who believe they will benefit from the interventions promised can be thought of as a network (Van Lente, 2000).

Finally, the VKS program specifically maintains an analytic stance with regards not only to current practices, but also to current technological paradigms. It argues that important fields in the humanities and social sciences are characterized by a huge epistemic diversity; by specific, sometimes person-bound, roles of the researcher; by the lack of consensus about the research agenda in a host of specialties; by a relatively low-tech

research environment (often aggravated by the scarcity of university funding); by the specificity of writing and reading as features of knowledge creation; and by a historically grounded and relatively large share of solitary research practices (Becher, 1989; Whitley, 2000). In all these dimensions, many fields seem ill-suited to become enthusiastic adopters of the e-science paradigm as it now stands. Therefore, if e-research is to make sense to a variety of specialties in the humanities and social sciences, new non-computational and computational paradigms of e-research may need to be developed (Wouters & Beaulieu, 2006). The Studio therefore promises to be a clearing house of expertise, partner in the development of new practices, and provider of insight into new dynamics of knowledge creation in ways relevant to STS research.

At the time of writing this chapter, the Studio has been intervening for two years. Fighting our tendency to look ahead to what we would still like to accomplish, we reflect briefly on the shape of our interventions so far. As part of our research activities, the VKS has been able to pursue the issue of intervention in the shape of a project that specifically examines how different scholars have juggled that issue in their careers,⁹ while this chapter considers intervention as a more programmatic and institutional activity.

We have also been able to develop a number of projects where intervention is part of the expected process or outcome of the projects. With regards to kinds of interventions, we have been relieved to see that an early fear has not materialized. We were wary of being perceived as a 'helpdesk', and that researchers in the various fields we see as our constituency would mainly seek us to intervene as technology experts. This has not happened much so far. Indeed, our own work practices, while experimental and innovative in some respects, tend to be relatively low-tech, as the researchers currently developing a web-based collaborative workspace for the VKS have commented.

While it is still early in our research program, specific kinds of interventions do seem to have been dominant so far. In particular, our role as 'broker' among groups and as 'host' to particular practices seems to have gained most support and recognition so far. Several of our successes with funding rely on our ability to function as brokers between groups. In these projects, our activities are represented as the creation of interfaces between disciplines and research practices, as supporting hubs between sub-fields or as having a networking role.¹⁰ Yet another set of projects emphasizes the element of mediation. In these projects, the role of the VKS members is to reflect upon and shape the insertion of particular tools (web-based applications, simulations, mediated communication) or the coordination of new kinds of sources (web archives, mailing lists, other kinds of digital data).¹¹ These emerging metaphors of *interface* and *mediation* would appear to be rather rich descriptions of our potential—at least they evoke more complex processes than if our interventions were to be characterized as 'implementation' or 'digitization'.

We should note that constraints are also becoming apparent. These interventions are part of our work, but given our primary identity as a research group, they are performed 'on top' of the expectations one has of a research institute. This is a pressure that comes not only from the need to justify ourselves to our funders, but also from the need to remain visible as scholars for the fields in which we hope to keep intervening. Having the status of scholars linked to a given field seems to work as an important prerequisite. A second issue has been our encounter with conventions about intervention. We have received several variations of the following comment in reviews of our interventionist work: who are you exactly in this process? Being both subject and object, part of a change and its agent, seems to be something that is difficult to articulate (for us as writers) and to evaluate (for reviewers and editors). Certainly, the convention of anonymisation is difficult to implement when writing about our initiatives, where we are both authors and participants in the material discussed. It may be that reviewers have to get used to listening to a different kind of interventionist voice. Perhaps interventions are not to be written about in research articles. Perhaps there is a way to do it, but we have not yet found it.

We also seem to have been able to develop a particular kind of internal interface with members of the Studio. While different members surely experience this in a variety of ways, there is a general feeling, in our own discussions and in the perception of the Studio, that we have set up a way of working in which intervention is possible. VKS researchers work with a degree of openness and an intensity of interaction that is somewhat unusual for a humanities or interpretative social science research setting and that seems to be gradually developing into a hybrid between a scholarly and a designer style of working. Practicing what we preach may also be contributing to building up our skills to intervene with colleagues outside the Studio.

CONCLUSIONS: MANAGING EXPECTATIONS

As will be clear by now, the expectations that underlie the funding and support of the Virtual Knowledge Studio are related to 'modernization' or 'rationalization' of humanities and qualitative social science research. The expectation is for improved ('enhanced') research, through the mobilization of technology. This is not something the Studio explicitly embraces, but this element is present in its discourse, if only as a straw man / bogeyman. In approaching possible constituents, the VKS is able to leverage STS sensibilities to disciplinary differences as a way of differentiating the Studio from those who would unilaterally impose natural science processes on the humanities. This discourse also posits the Studio as an obligatory passage point, through which particular segments of social scientists and humanities scholars might get access to some of the funds associated with ICT, while also maintaining their distinct identities

through our ‘validation’ of the particularities of their practices. Concretely, this means speaking a language of experiment and new experiences, rather than of overhaul and revolution.

It bears repeating, at this point, that the interface with actors in the field is a fruitful site, not only of funding, but also of important insights for STS. For example, the definition of e-science is not strictly a technical issue. It also raises important questions for STS itself, regarding the dynamics of innovation, processes of academic agenda setting, and the role of ‘promises’ in the development of new tools and practices (Fry, 2006). These questions are addressed by researchers in STS in a scholarly manner (in contrast to our discussion here about the pragmatics of the initiative). Yet, the scholarly and pragmatic dimensions intersect in this kind of work.

The problem as formulated in our work is strongly shaped by the STS tradition, and a constructivist approach to technology that seeks to open up black boxes and questions the ways they come to be closed. It emphasizes practices rather than technologies, to prevent a tool-push approach. Nevertheless, the existence of particular promises associated with e-science has been very important in giving the means to realize and conceptualize the VKS. Shaping hopes as a kind of intervention is furthermore present in some of the earliest work in the Studio, in writings about the kinds of hopes that fields such as women’s studies might like to see taken up in the way e-science develops its promise (Wouters & Beaulieu, 2006). Hope therefore enables this work and forms a site of intervention. In the same way, our developing track record may also be shaping future possibilities.

The double role of STS research in the management of expectations is our answer to the question whether it is possible to combine critical analysis with design. The Studio therefore plays a complicated game in which it alternates positions in order to enable a critique of *both* the present scholarly practices in the humanities and social sciences and of the modernist critique of these practices. This may be enabled by the fact that the Royal Netherlands Academy for Arts and Sciences (KNAW) itself is an organization in which intellectual excellence is highly valued and in which a variety of philosophical positions about the value of knowledge can be found. We propose a sharpened analytic framework for understanding the relationship between STS and intervention. It is an approach that is prospective, reflexive and strategic, and in which STS has been so aware of the power of promises and hope in science that it also becomes aware of the power of promises and hope for its own goals. This chapter is an occasion to further develop this aspect of our work. Following Brown, we believe that ‘situatedness of expectations’ is an important goal to diminish the costs of hype/ unfulfilled promises: “we need to reflect upon the actual contexts and conditions in which expectations, hype and future imaginings are embedded” (Brown, 2003: 10). But also, in our view, this is a way to produce better STS research. Again, it is important to note that we are not trying to do away with hype/hope, because it is constitutive of present and near future

activities, as has been argued by Brown (2003). Intervention also implies power to change situations.

Our first preliminary conclusion is the importance of developing a critical stance with respect to the underlying motivations of research funding in interventionist contexts. These motivations (whether they be constellations of more or less distributed ambitions, drives, or needs) should first of all be taken seriously. At the same time, these motivations can be approached critically and this critique can form an integral part of the research project. As our research develops, we also come to realize that this question is also relevant to smaller gestures (collaborations, co-authorship, etc) and to other kinds of large ones besides funding—such as infrastructural or institutional decisions. Interests, big or small, remain important elements in shaping what kinds of research are possible.

Our second conclusion is that it might be a fruitful strategy to open up the research process to a variety of actors and conflicting influences. In the case of the Studio, the research program is under discussion with the funder (the KNAW) and the scholarly communities involved (STS community, humanities communities, social science communities). This strategy might also be useful in other contexts, such as society and genomics or the social impact of nanotechnology, since it prevents a monopoly position of the funding agency.

Our third conclusion is that it becomes more urgent to work pro-actively on the criteria of one’s own assessment—a stance we increasingly see in other research institutions and universities. The traditional indicators of academic quality (publications in high-reputation journals and publishers) are perhaps not enough, since they cannot capture the relevant dimensions of the role of intervention in present scholarly practices. Other criteria may become important in this respect: participation of scholars in the Studio, invitations, new software tools, accessibility of datasets and digital resources, in-links to our Web sites and, not least, success in acquiring additional funding. This signals the need for theories that can be mobilized to develop assessment indicators and approaches, knowing that not every important dimension can be measured quantitatively, and that various criteria must be coordinated rather than added-on.

Developing these three strategies will perhaps also make clear what can be learnt from e-research in methodological terms. The discussion about the merits of action research versus more distanced analytical work has mostly focused on the value of a particular research project with only a few researchers involved. In e-research, however, we are dealing with an infrastructure as intervention. To what extent does this difference in mode of intervention matter? Does it make it more difficult for researchers to ‘speak back’ to the intervention, unless the infrastructure is explicitly made a topic for conversation and dispute? A second dimension might be the technological. In our research we are explicitly using technology as a probe to analyze and disturb existing scholarly practices. In most discussions about

interventionist research, technology does play an important role, but the intervention is usually located in the persona of the researcher herself. In our practices this may be the case to a lesser extent, although we acknowledge that this is also a matter of framing. Perhaps we will have more leeway in dealing with the tensions between being involved in e-research and being critical about it, because we are not seen as the primary source of intervention. On the other hand, our role as interface, broker or mediator seems to be our fastest growing concern.

Finally, and perhaps most importantly, e-research may enable the actors themselves to become the prime interventionists. In other words, e-research may help create an invitation to scholars in the humanities and social sciences to intervene themselves in their own practices, or at least to be more reflexive about these changes. At least one chapter in this collection points in this direction, where the probing of researchers about the role of a new application led to reflection and articulation by researchers of their own changing expectations of the technological support (See Chapter 5 in this volume by Genoni, Wilson and Merrick). We have tried to draw out the ways in which the requirement for intervention, in its precise formulation and counter-formulation (or reformulation), have shaped the approaches, structures and recent developments of the Studio. By opening up this area of expectations, our article is not only a reflection upon and critical analysis of the management of expectations, but also an invitation to participate in it and thereby shape the Studio into what it may become.

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NOTES

1. See the Web site of the conferences, <http://www.ncess.ac.uk/events/conference/> (accessed 9 April 2008).
2. For more information about the VKS, see <http://www.virtualknowledgestudio.nl/en/> (accessed 9 April 2008) and about the Academy, see <http://www.knaw.nl> (accessed 9 April 2008).
3. In our view, the interchangeable use of these terms threatens to collapse distinctions between tool, practice and knowledge. These are of course inter-related concepts, but an indiscriminate use of cyberinfrastructure to refer to research practices elides what might be needed beyond the hardware.

4. At the time, we were not aware of the work of Anderson and Kanuka, and wish to thank Nick Jankowski for bringing this reference and other use of the term to our attention.
5. By this we mean financial space, less pressure to have only traditional output, access to expertise, space for new tools, etc.
6. See for example <http://www.nrcam.uchc.edu/login/login.html> (accessed 9 April 2008).
7. Whether this is a desirable and unavoidable condition is beyond the scope of this chapter but it is a crucial issue, given the current dependence of researchers and universities on contracts with firms.
8. See for a sustained research program in the science of collaboratories: www.scienceofcollaboratories.org (accessed 9 April 2008).
9. See the project undertaken by Ernst Thoutenhoofd and Teun Zuiderent, http://www.virtualknowledgestudio.nl/staff/ernst-thoutenhoofd/intervention_technology.php (accessed 9 April 2008).
10. See www.virtualknowledgestudio.nl for descriptions of current and completed projects.
11. See the projects developed by Jan Kok and the resulting work of Stefan Dormans and Jan Kok in setting up and analysing collaboratories: <http://www.virtualknowledgestudio.nl/projects/socio.php> (accessed 9 June 2008).

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