King's Digital Lab

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Maximising Research Capacity & Quality in Digital Laboratories: The Philosophy behind King's Digital Lab

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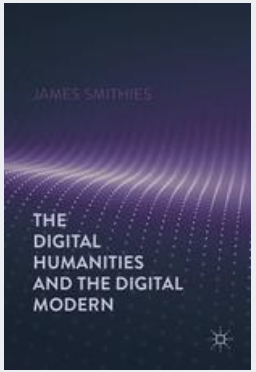
Current research

The Digital Humanities & the Digital Modern (Palgrave Macmillan, 2017).

- Digital humanities need to be understood in the context of 'the digital modern'.
  - Reflexive Modernity (Anthony Giddens et al).

- We need to develop critical theories that can help us both understand digital media & culture and build working digital tools / products.
  - Postphenomenology (Donald Ihde, Peter-Paul Verbeek et al).



Future research

The Epistemology of the Machine.

- An exploration of how humans have used machines, over the long-term, to construct knowledge and meaning.
- Antikythera mechanism / Chinese water clocks >> Digital Humanities / eResearch / High Performance Computing / AI.

The Antikythera mechanism (Fragment A – front), 150-100 BC.

The IBM Blue Gene/P "Intrepid" supercomputer, Argonne National Laboratory.

Amazon Echo 'AI' assistant.

But why focus on laboratories?

- Laboratories are key sites in the construction of knowledge, and hence meaning.
- Scientists worked out what they are, and how they work best, 100 years ago.
- Humanists and social scientists are still working that out. The better we understand it, the better our labs (and the knowledge & meaning they produce) will be.

James Gillray, Scientific Researches. New Discoveries in Pneumatics, 1802. National Portrait Gallery, London.

Molecular Biology Technics Laboratory at Faculty of Biology of Adam Mickiewicz University in Poznan (*Wikipedia)*.

We must not only search for, and procure a greater number of experiments, but also introduce a completely different method, order, and progress of continuing and promoting experience. For vague and arbitrary experience is (as we have observed), mere groping in the dark, and rather astonishes than instructs. But when experience shall proceed regularly and uninterruptedly by a determined rule, we may entertain better hopes of the sciences.

Francis Bacon, *Novum Organum*, 1620.

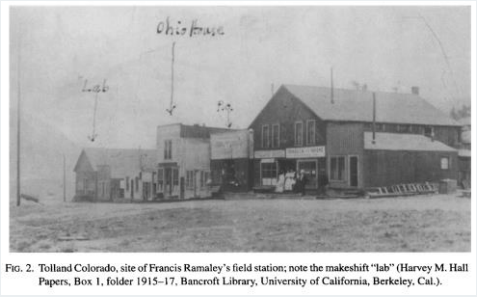


Fig. 2. Tolland Colorado, site of Francis Ramaley's field station; note the makeshift "lab" (Harvey M. Hall Papers, Box 1, folder 1915–17, Bancroft Library, University of California, Berkeley, Cal.).

Fig. 4. Boat-lab, Illinois Natural History Survey, 1894–95 (Illinois Natural History Survey, Champaign, Ill., negative no. 875).

Fig. 6. University of Pennsylvania Vivarium *c.* 1903 (University of Pennsylvania Archives, Philadelphia, Pa.).

Robert E. Kohler, "Lab History: Reflections." *Isis* 99, no. 4 (2008).

Cern. CC0 Brücke-Osteuropa.

Ivanka Trump in the lab, 2018. Meme by @MaryViglione.

King's Digital Lab

The evolution of KDL

- 30 years of activity, against a background of rapid innovation and change in Humanities Computing and Digital Humanities.
- Centre for Computing and the Humanities (1991); Centre for eResearch in the Humanities (2008).
- Department of Digital Humanities (2011-):
  - ~500 students across 5 Masters and 1 Undergraduate degree.
  - ~40 academic staff.

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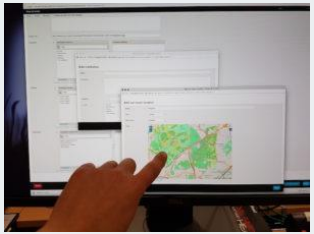
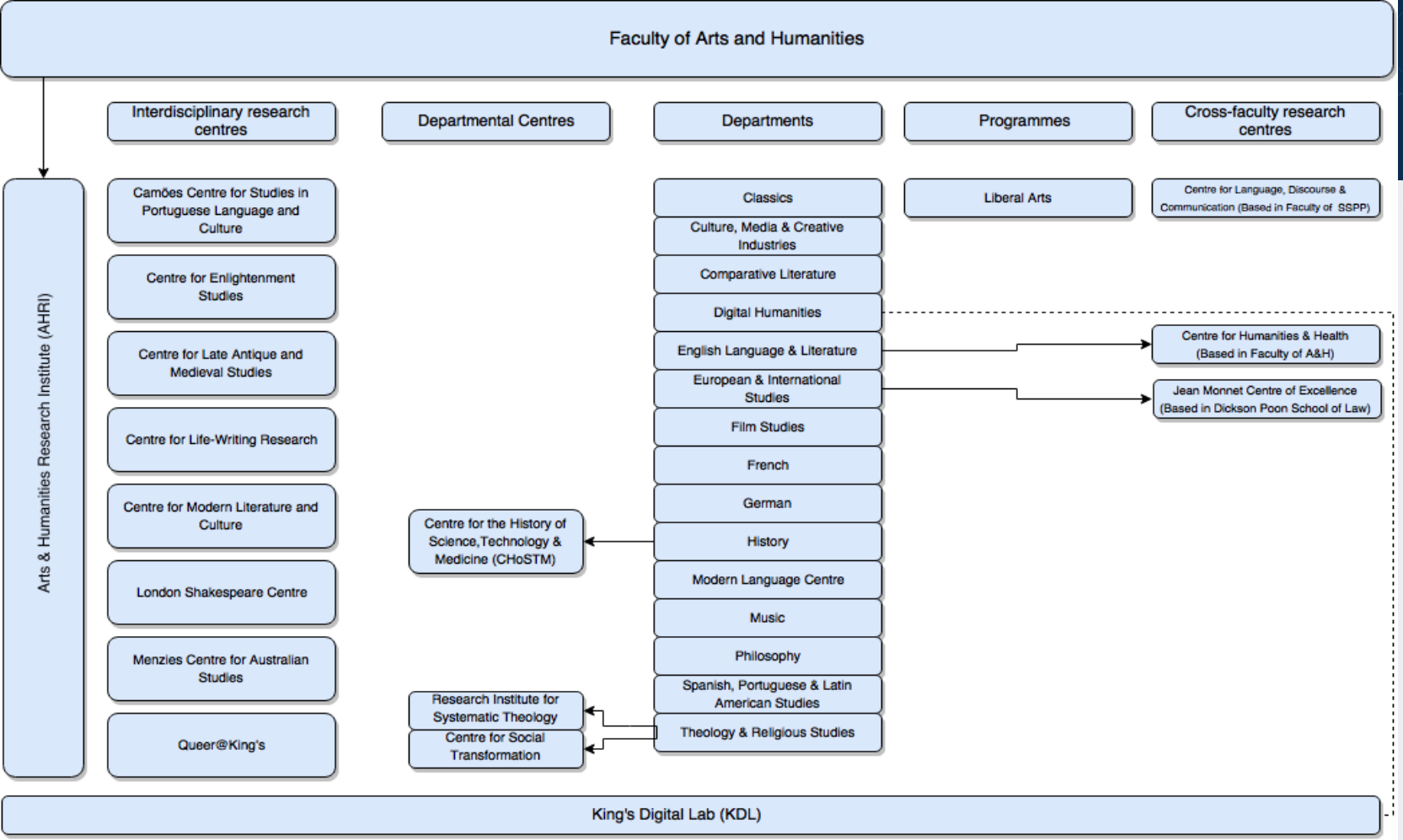
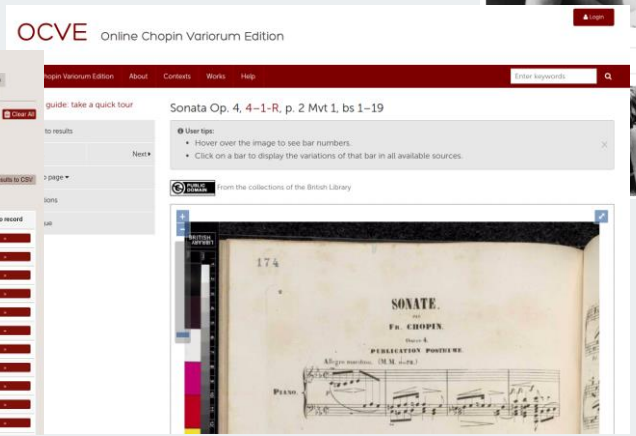
- Established 2015. See https://www.kdl.kcl.ac.uk/blog/kdl-launch/.
- 12 permanent staff: Director, Deputy-Director, Project Manager, 3 Analysts, 4 Software Engineer, 2 UI/UX Developers, 1 Systems Manager. 1 contract analyst. Research Affiliates / Visiting Fellows.
- ~200 virtual machines, ~1TB RAM, ~45TB data.
- ~100 inherited projects, 20 ongoing. ~5 million digital objects.
- 8 countries of origin, 11 languages.
- Supported by external funding, under-written internally.



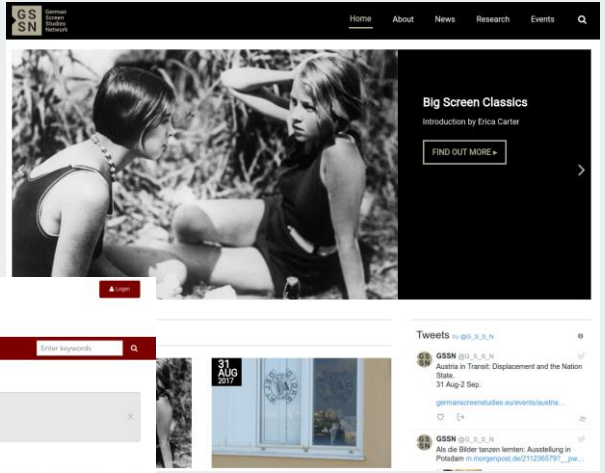

Faculty of Arts and Humanities
Interdisciplinary research centres
Departmental Centres
Departments
Programmes
Cross-faculty research centres
Arts & Humanities Research Institute (AHRI)
Camões Centre for Studies in Portuguese Language and Culture
Centre for Enlightenment Studies
Centre for Late Antique and Medieval Studies
Centre for Life-Writing Research
Centre for Modern Literature and Culture
London Shakespeare Centre
Menzies Centre for Australian Studies
Queer@King's
Centre for the History of Science,Technology & Medicine (CHoSTM)
Research Institute for Systematic Theology
Centre for Social Transformation
Classics
Culture, Media & Creative Industries
Comparative Literature
Digital Humanities
English Language & Literature
European & International Studies
Film Studies
French
German
History
Modern Language Centre
Music
Philosophy
Spanish, Portuguese & Latin American Studies
Theology & Religious Studies
Liberal Arts
Centre for Language, Discourse & Communication (Based in Faculty of SSPP)
Centre for Humanities & Health (Based in Faculty of A&H)
Jean Monnet Centre of Excellence (Based in Dickson Poon School of Law)
King's Digital Lab (KDL)

http://www.finerollshenry3.org.uk

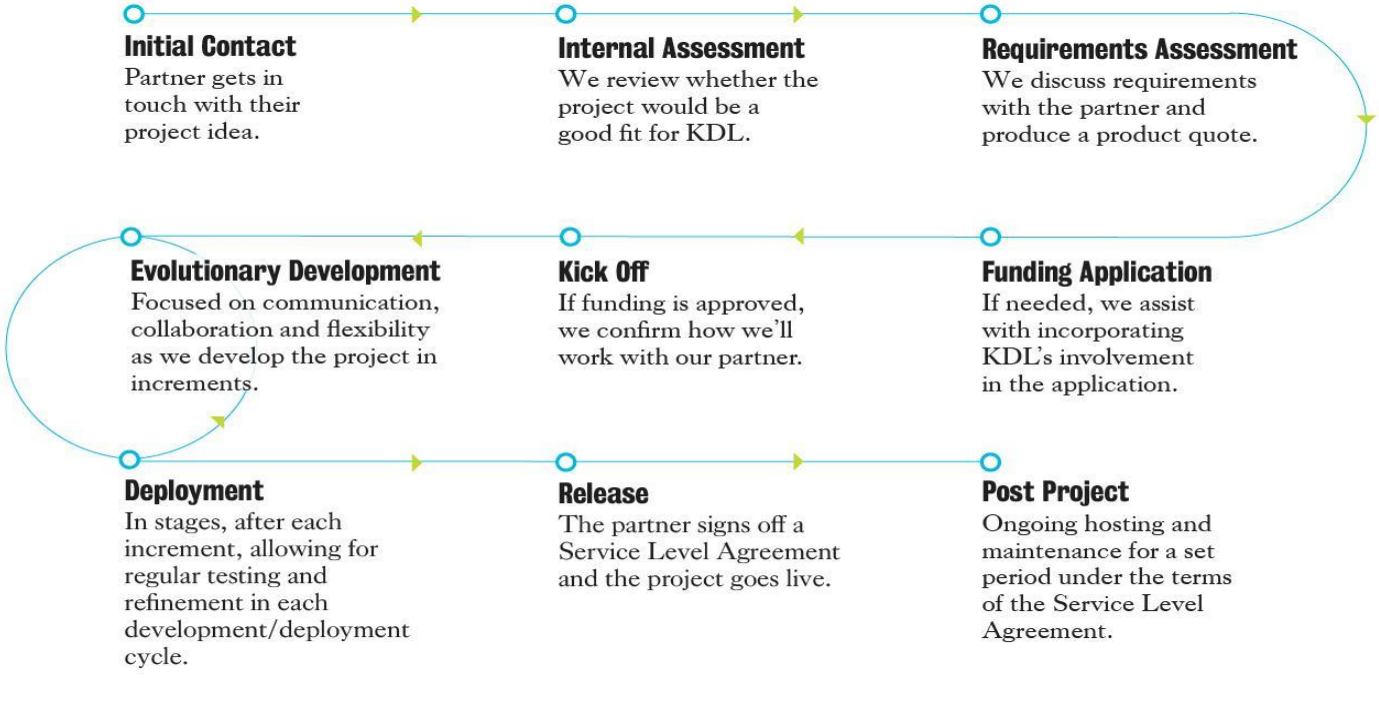
http://www.chopinonline.ac.uk



http://www.aemap.ac.uk



http://germanscreenstudies.eu


Initial Contact
Partner gets in touch with their project idea.
Internal Assessment
We review whether the project would be a good fit for KDL.
Requirements Assessment
We discuss requirements with the partner and produce a product quote.
Funding Application
If needed, we assist with incorporating KDL's involvement in the application.
Kick Off
If funding is approved, we confirm how we'll work with our partner.
Evolutionary Development
Focused on communication, collaboration and flexibility as we develop the project in increments.
Deployment
In stages, after each increment, allowing for regular testing and refinement in each development/deployment cycle.
Release
The partner signs off a Service Level Agreement and the project goes live.
Post Project
Ongoing hosting and maintenance for a set period under the terms of the Service Level Agreement.

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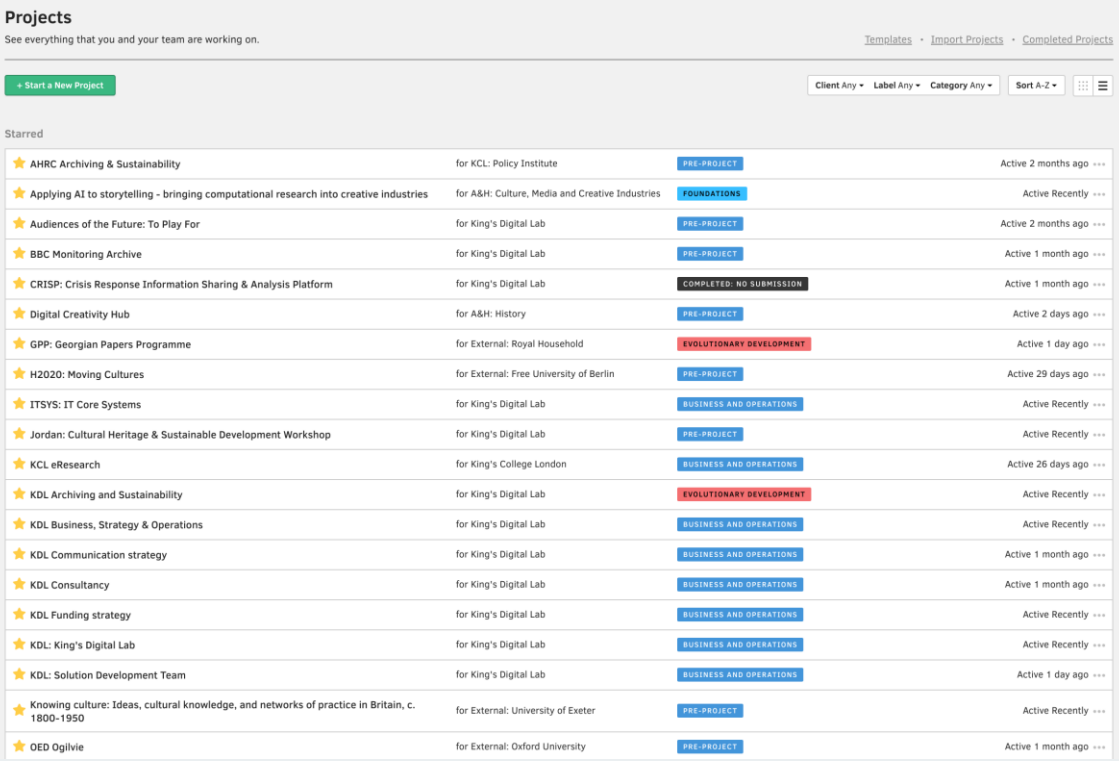

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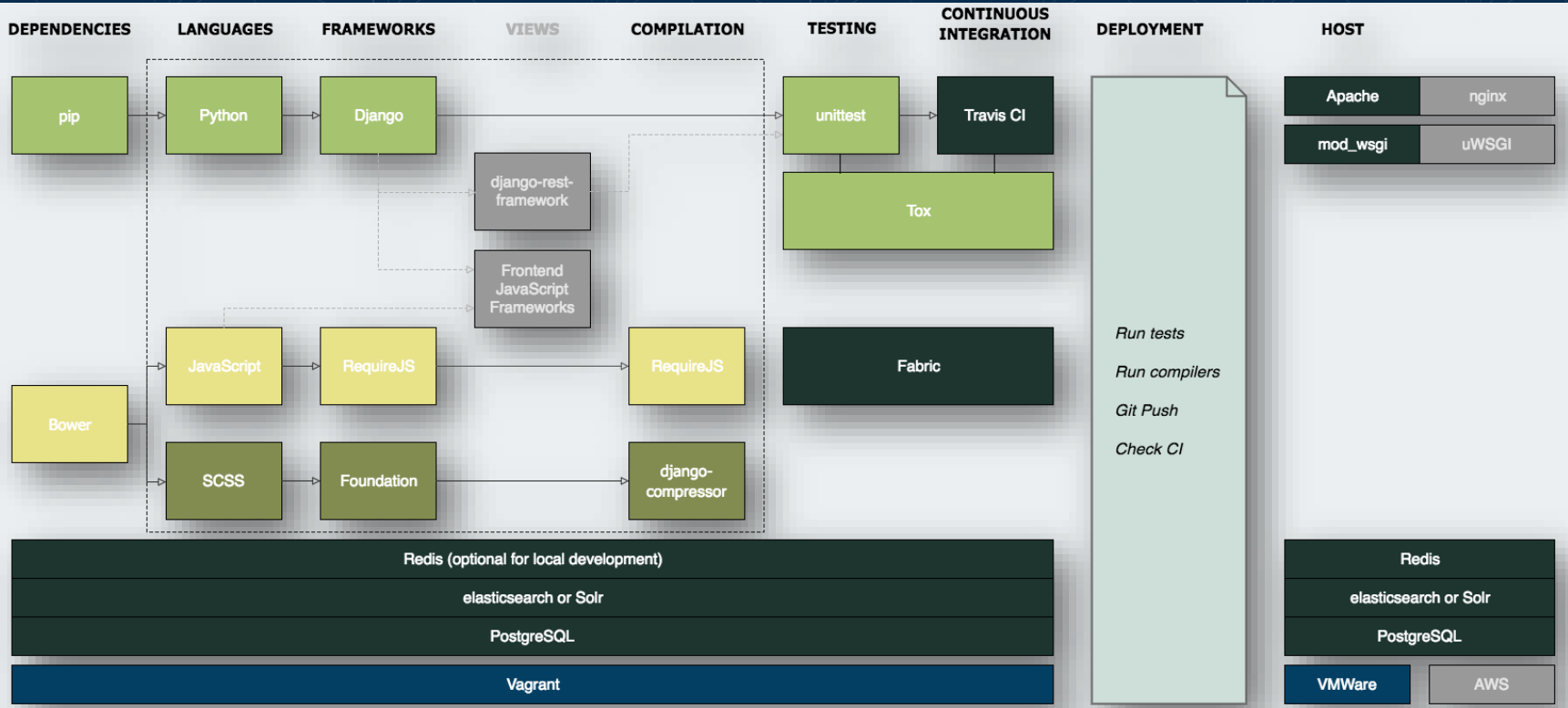


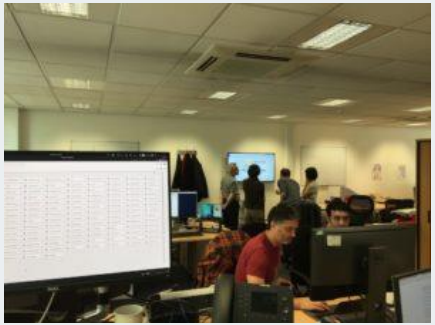
Digital Labs as Socio-technical System

What *is* a digital (RSE) lab, and how might we try to understand them?

A socio-technical system

History of Technology (engineering / materialism / historicism).

Post-phenomenology (the entanglement of humans and things).



Social Studies of Science (constructivism, tacit knowledge, ethnography).

Epistemology (the nature of Truth, the process of knowledge creation).

What should we be looking for in these 'socio-technical systems'?

Karin Knorr-Cetina, The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science (Pergamon Press, 1981), p.47:

To restore the contextuality of science, we have had to go into the laboratory and observe the process of knowledge production. In view of the opportunistic logic we found at work in this process, "scientific method" can be seen as a locally situated, locally proliferating form of practice, rather than a paradigm of non-local universality. It is context-impregnated, rather than context-free. And it can be seen as rooted in a site of social action, just as other forms of social life are.

Doable problems

"…technology alone cannot make problems doable. Doability is better conceptualised as the alignment of several levels of work organisation."

FIGURE 1
Aligning Levels of Work Organization to Construct Doable Problems

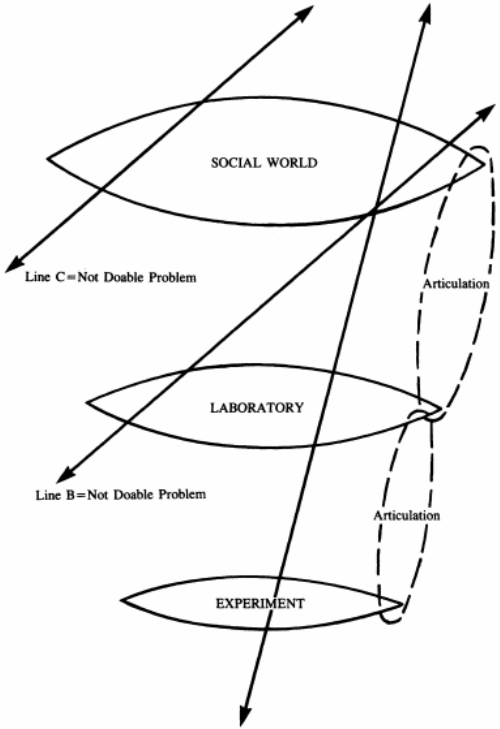
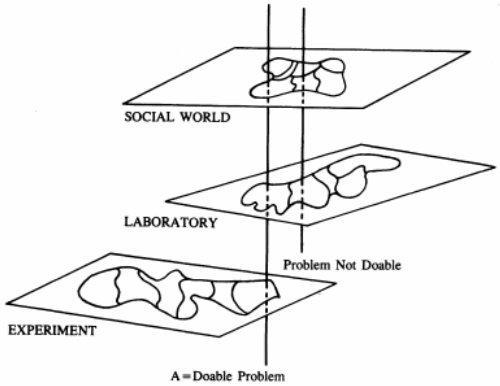
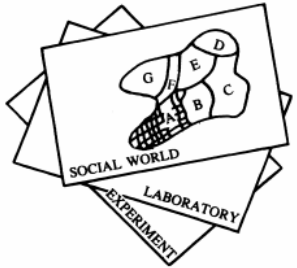


FIGURE 2
A Metaphor for Aligning Tasks at Three Levels of Work Organization



View from above



Joan H. Fujimura, "Constructing 'Do-Able' Problems in Cancer Research: Articulating Alignment," *Social Studies of Science* 17, no. 2 (1987): 257–293.

Conclusions

- Digital laboratories imply ethical as well as epistemological and methodological load:
    - Ethical duty to continue the research tradition as traditionally conceived.
    - Ethical duty to avoid the replication of inequities of tech-sector culture.
    - Ethical duty to manage our financial responsibilities transparently – and perhaps even aim to profit - in consciousness of the opportunity costs for our colleagues.
    - Epistemological duty to safeguard but also extend the modes of knowledge creation and interpretation open to researchers in a manner in keeping with their disciplinary traditions.
    - Methodological duty to be experimental and innovative – and embrace the possibility of failure – but also transparent.
    - An epistemological / methodological duty to embrace the full spectrum of 'meaning construction', from using algorithms to 'deform' poems, to crunching data from large scientific instruments.