

Emerging Configurations of the Virtual and the Material

A Workshop to Consider the Intellectual Frontiers of Information Research

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The Following is the introductory text describing the motivations for a workshop held earlier this year to explore the foundational research directions open to iSchools. The graphic figures that follow are what was generated in real time during the workshop. A full report is in process and will be available circa February 2012.

INTRODUCTION

"A fundamental reinterpretation of the nature of information and of its organizational implications and requisite expertise for the academic library in the next 10 years is essential" (Charles J. Henry, President, Council on Library and Information Resources (CLIR), <http://www.clir.org/pubs/issues/index.html#enrich>)

*"Information Schools ('iSchools') address the complex relationships between information, technology, and people. This is characterized by a commitment to learning and understanding the role of information in human endeavors. The iSchools take it as given that expertise in all forms of information is required for progress in science, business, education, and culture. This expertise must include understanding of the uses and users of information, as well as information technologies and their applications."*¹

When new academic fields emerge, there is often a disconnect between the supply and demand of available intellectual resources – for example 'bioinformatics' emerged as an interdiscipline in its own right only several years after a need arose for biologists who could tackle the increasingly complex and sophisticated issues regarding the management and use of voluminous data resulting from mapping the human genome. This experience has been replicated in varying forms in other scientific disciplines, as well as in the humanities, signaling the emergence of a need for transdisciplinary² research that extends and ultimately transforms traditional research directions in the study of information. Researchers have responded to specific instantiations of these challenges, but we now see the need and opportunity to consider a broader and clearer articulation of the scope of the issues arising. We propose a research workshop to explore these challenges. There are

¹ Larsen, Ronald L. "The iSchools", Encyclopedia of Library and Information Science, Third Edition, Marcia J. Bates and Mary Niles Maack, editors, CRC Press, 2009.

² Wikipedia: "Transdisciplinarity connotes a research strategy that crosses many disciplinary boundaries to create a holistic approach"

many possible ‘cuts’ we can take on the emergent information research problematic – we have chosen to explore ‘new configurations of the virtual and the material’.

Over the past 250 years, and at an accelerating pace today driven by the relatively recent shift to computationally intensive scientific methodology involving very large information resources, virtual representations of physical spaces, materials, and phenomena have proliferated, in many cases replacing the physical as objects of study. [Ugaritic](#) texts are far more easy to read online than physically (lighting conditions in museums being less than optimal); [papyri](#) and ancient scrolls can now be read using MRI technology without injurious unrolling; archeological sites can now be examined without inherently destructive attempts to dig and rebuild. In these, and a growing number of other examples, the virtual assumes greater importance and may even seem more concrete than the material. Underlying these examples is the exploitation of large-scale computation and information that we seek to explore in transdisciplinary terms.

Interestingly, there appears to be a flip side to the growing dominance of the virtual in studying the material. Online (natively virtual) groups are evolving into real (material) communities (consider, for example, the communities of [soap opera fans](#) as discussed by Nancy Baym). Three-D printers are increasingly used to express the complexity of digital cartographic maps and architectural designs. One measure of the magnitude of the shift to computation and information-intensive activities is Google’s development of huge clusters of [servers](#) that draw on Iceland’s cold water and geothermal energy. The virtual is insinuating itself into the material and changing it, just as the social geography of the developed world was revolutionized by the laying of electrical lines so that sources of power and manufacture could be decoupled. Finally, new phenomena are occurring such as [flash mobs](#) – where the virtual (SMS) and the material (creating new forms of political action) are deeply intertwined.

Information researchers from a range of disciplines are discovering the need to examine these phenomena as instances of a larger whole. Each clearly draws on scholarship and expertise from their native disciplines, with the common element being the recognition of an emergent transdiscipline.

The central motivation for this workshop is our assertion that emerging ‘new configurations’ provide bellwethers of change that we ignore at our peril, and which energize (and, perhaps, even define) information research. They afford the possibility for (or, perhaps require) new transdisciplinary knowledge that cannot be forged in the foundry of any single discipline. Consider a counterexample from the 19th century. Although this was in many ways the century of classification - there was no **one** science of classification. Each discipline (etymology, linguistics, biology) discovered the principle of ‘genetic classification’ (classifying objects by their origin) anew. As Patrick Tort demonstrates, this occurred by happenstance (a student in, say, linguistics taking a course in evolutionary theory); even today, it is rare for classification discourse, as such,

to speak to multiple traditions. It's intriguing to play the 'what if' game that imagines what might have been, had we recognized the fundamental constructs being reinvented across scientific disciplines and intervened to nurture development of a common foundation. At this workshop, participants *will* play the 'what if' game, with the potential that we turn this supposition into a proposition forceful enough to guide information research in the near term and reframe computationally intensive and information-intensive research disciplines in the long term.

WELCOME & OUTCOMES

Ron
Larsen

What's
our research

Who are we

Our story.

What
distinguishes
iSchools?

iSchool
Deans

What are
the GRAND
CHALLENGES
iSchools should
pay attention to?

PRIMING the PUMP

CORY KNOBEL

How we do science!

Pattern complexity overwhelmed by amount of data.
sensory capacity overwhelmed.

Rewards for boundary spanning work in Univ.

DOMINIQUE BOULLIER

Get rid of computer in our head...
Get rid of devices
New ways of looking for knowledge
Scale... always on ALERT

SHELTER to HESITATE
SHARE KNOWLEDGE in the MAKING.

ELEN BAIKA

Start w/ ski areas
injury epidemiology
paper airplanes
like setting up health records.

Handovers in care!

PABLO BOZKOWSKI

Daddy what's that?
What are the things we bring forward?

STEVE GRIFFIN

Create user interfaces for computational data.

Geo-ref.
360° view

ALAN LIU

Agrippa
loose sheets in playlist format.

Social environments hold the book together.

social clusters of reading.
the Re-bound book?

BILL ARMS

Why haven't Universities CHANGED?

Persia
Mozart
lecture
expensive

Broad, small #s of faculty

Big Research.

BRITISH OPEN UNIV.
less expensive. distance learning.
eCornell → disaster

Opty...
one core course taught by all.

NOHA ADLY

DATA OVERWHELM
image text
Users refer to data despite multi languages.
SOCIAL MEDIA
New ways to manage data
gist of semantics

MARTIN WEISS

Spectrum allocation.
Next: Virtualize spectrum.
Policy: create a better world?

TL TAYLOR

M2 \$ for games
PLAY AS A RUBRIC

40 people playing.. coord.

CO-creative
radical reformulation by gamers.

BLURRED BOUNDARIES
data mining implications

How is co-creative way gamers work translate to "real" world.

role of non-human actors.

40 people playing.. coord.

RAMESH SRINIVASAN

Diversity
Digital Police
Homogeneity or ↑ diversity?
Museum data
Lived data

Access & diversity...
impact of digital world.

PRIMING the PUMP #2

SEANUS ROSS

Ancestry.com

WHO owns & manages data?

AUTHENTICITY
INTEGRITY
RELIABILITY

sources of data?
how is it constructed?

? Role of public science?

PAUL UHLIR

Conference on the Public Domain

Info commons on e-science

Microbial Research Commons

Print Paradigm → Global Digital Networks

How do we use for info exchange?

? Designing digital commons.

new models | social-not tech problem.

KURTIS LESICK

I hate ppt! → Info to data.

passivity the paradigm for our thinking

reducing thought | authority

Ha! I broke the ppt rules

Archival power plays...

book burning | lawsuits on data distribution

? CONTROL by....?

DISCUSSION ROUND 1

What does it mean to be an individual?

see change
what can we do w/ data

reflexive... know, or just do
gaming... group required

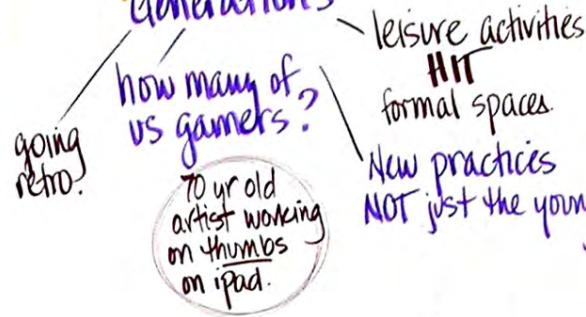
PERFORMATIVITY

Make it VISIBLE & REFLEXIVE

Environmental art.. making the cloud smaller.

MULTIPLE IDENTITIES

generations



what is the cloud?

MATERIALITY

Material nature of technology.

Kids are doing CREATIVE things

vs. Defn: a digital publication is a paper that's on-line.

Stepping out of our paradigms can cost us...

Understanding vs. Influencing our role....

PRIMING the PUMP #3

JONATHAN GRUDIN

Books to Pamphlets

Guidance for using the web. "How ya gonna keep 'em...?" Evolution + Revolution via the Net.

? How fast! Lack of systematic data collection.

RICHARD COX

fiction / truth / Archive paradigm / memory

Public memory in war we destroy libraries then recreate data systems for new memories.

? Bring the "Blessings" into the work we do. Faith... hope...

LAWRENCE BUSCH

Alberti & Burer database grid ubiquitous

? What's left out? ? ignored? ? Outliers? ? Lossiness? ? Resisting "gee whiz" ? Stories?

? What other realities are excluded?

JIM NEAL

ORAL HISTORIES. tap into databases. forensic studies.

HUMAN RIGHTS on WEB DOCS. Power & influence evidence

NEW MEDIA SIMULATIONS Research Educ Community svc.

DON WATERS

scholars resist change * Bibliographic * On-the-ground work... decades.

Analog to digital archive * Transcription work. * New tools. ? How to accelerate

KELVIN WHITE

Archival universe values rituals heroes symbols

Multi universes cutting thru multiple angles ? How do we use technology so its MUTUALLY BENEFICIAL between multiverses?

NANCY VAN HOUSE

photograph video f 3 billion images/mo DailyBooth: image-based facebook.

? Why do people share images? ? what can image do text can't? ? Implications ? Personal transitory.. collective persistent

RON LARSEN

Text not adequate to data/understanding of world. were a linear species

Scale: global to local. If we could understand our data.. There's more knowledge in there.

? Data sharing Institutions evolve.

ROGER SCHONFELD

print ↔ electronic what info support needed? e courses: impact, utility, efficacy.

? structural changes in libraries nature of research discovery points.

CATHY MARSHALL

SUSTAINABILITY of digital archiving personal digital Multiple disciplines

? Digital hoarding local vs social. ? Big data vs. tiny pieces. ? Copyright.. who owns it all?

PRIMING the PUMP #4

CLIFFORD LYNCH

social scale simulations

- starting to work!
- becoming cheaper

streams of social media

PRESENT
FUTURE PREDICTING

- ? How to feed simulations?
- ? IT infrastructure simulation?
 - communication
 - thought.
- ? Artifact build out = quality check
- ? How good are predictions?
- ? Commercial/govt... what about academic?

The Fourth Paradigm

- data intensive research
- what are implications?

JOHN KING

Antarctic Treaty
→ SCIENCE

At the pole.
Road via plane
Ice Cube.

physical vs. biological sciences

? What use trumps the other...

DISCUSSION ROUND 2

OPERATIONALIZATION

collecting & ordering data ⇒ implications for how we make meaning.

what do we do in classroom?

When have we not lived in our times?

POWER

removing pauses in transcript changes meaning.

6 million viewers/episode on YouTube.
one guy....

"looking under the lamppost" → looking beyond e.g. neurophysiology

Social Production in Creation of Data

Newspapers around the world are actually BOOMING!

hearing ignoring

JOURNALISM

- dying species!

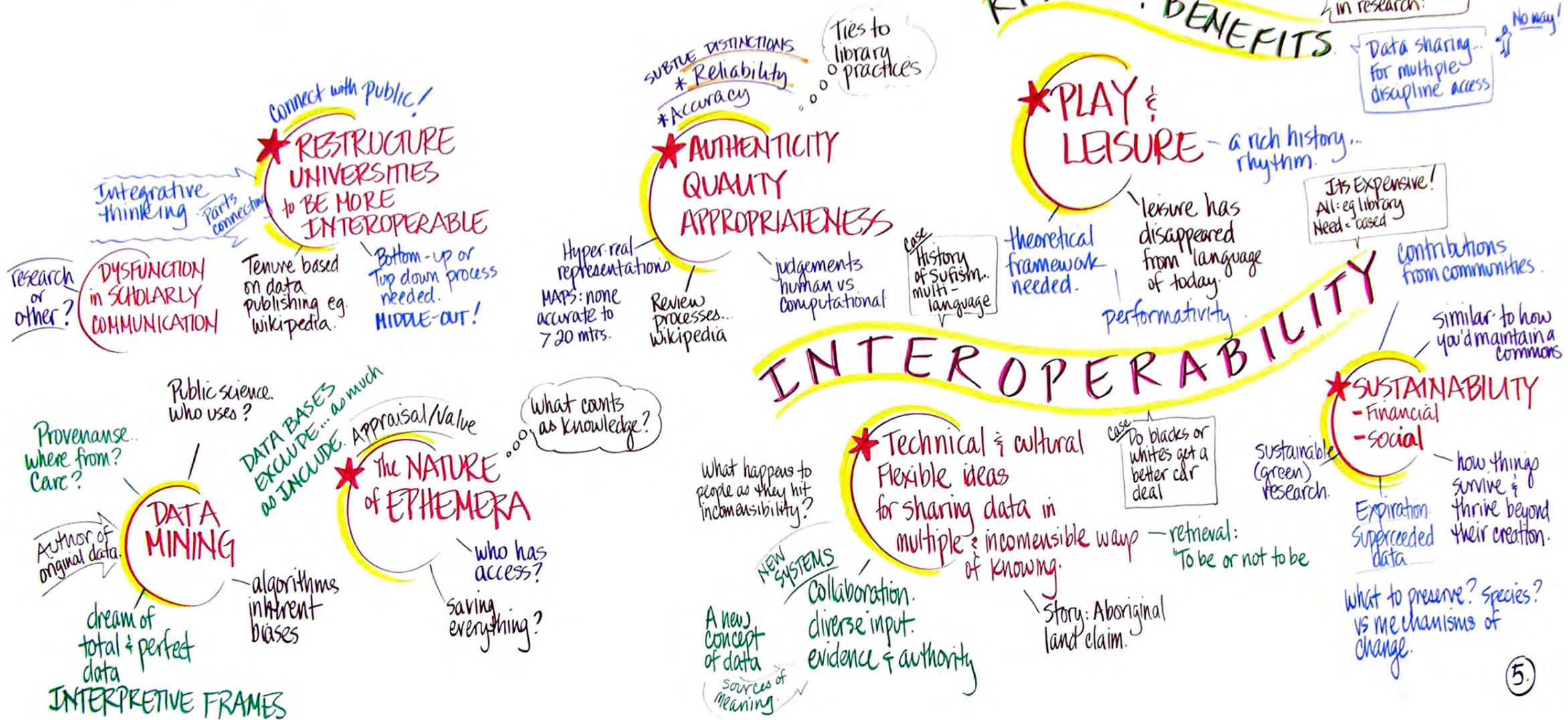
under pressure

Schools partner w/ journalism schools.

a lesson for journalism...

Geography depts. disbanded just before creation of GIS.

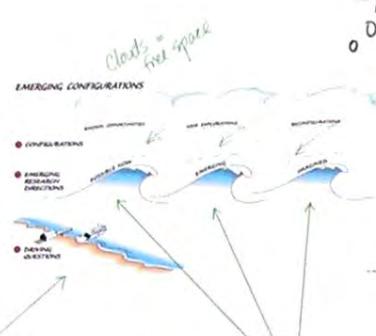
REPORT OUT & DISCUSSION



INSTRUCTIONS

STEP (1) Select a SCRIBE & a TIMEKEEPER.
3⁰⁰ BREAK
≈ 30 min/topic area.

STEP (2) DRIVING QUESTIONS
What questions are arising from your research?



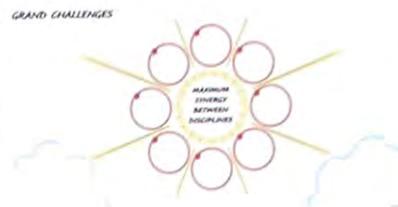
STEP (3) EMERGING RESEARCH DIRECTIONS
* What's possible now?
* What's emerging... 5-10 yrs?
* What can you imagine?
blue sky...

Fill in the template from the **BOTTOM UP!**

STEP (4) CONFIGURATIONS
What configurations could contribute to your research?

INSTRUCTIONS 3:15-4:00 pm

FIRST STEP (5 min)
In PAIRS
● Review the first chart.
● Write 2-4 most important Grand Challenge propositions
One Challenge/sticky



STEP (2) (5 min)
Collect & cluster stickys.
● Suggestion: 2-3 people SORT
● Put clusters in the rays.
● Write a main theme for the cluster in a circle.

LAST: (10 min)
Select 2 different people to present your 2 favorite challenges to the plenary.

STEP (3) (25 min)
DISCUSSION of each cluster.

During discussion: Write **RESOURCES, PROJECTS & PEOPLE** directly on the chart

- How would each cluster contribute to maximum synergy between disciplines?
- Home in on the 8 most promising challenges.
- Capture the essence of the challenge in the circle.

EMERGING CONFIGURATIONS

CONFIGURATION

KNOWN OPPORTUNITIES

- turning high level data sets into stories - algorithms from historic sociology
- Literature + (Aiken)
- NSF - data exploration + HCI is well!
- 4 humanities data intensive computing mobile it possible for soc. sci. to do big projects?
- Ramesh-Zuni NSF/STS project tutorial - no db
- Masri knowledge systems what we it look to take... embrace inaccessibility
- Culturally sensitive end of educational experience assessment
- linking algorithms more culturally sensitive in the ontology/indicative
- Scholarship based on audio for visual evidence constructing arguments non-technically?

EMERGING RESEARCH DIRECTION

POSSIBLE NEW

- Google - have treated multiple areas of study as 1 - tools that show multiplicity diversity differences what has been rendered invisible
- interventions in syllabus curriculum
- how do you create a division of labour in relation to "authoritative knowledge"
- User/patient provided info.
- reward systems in the university how can people talk in meaningful ways? method? evidence? relates to reward system?
- Wikipedia - challenges of expertise of new technologies
- interdisc. national international laboratory how are they changing?
- what are the grand challenges stem cell genomics etc.
- how do we empower sovereignty via emergent tools?
- data disciplines vary across disciplines should we unify?
- Are there differences between scientific data vs. social scientific data? Creative practices can
- stem sci sec sci humanities INFO sci as glue
- Will funding bodies keep up? How does the push for metrics influence things? Are we working against risk taking?
- is the notion of GRAND CHALLENGE even appropriate terminology?

NEW EXPLORATION

- what are appropriate curatorial practices in a de-centralized info production + consumption world?
- Citation practices
- how do you realign press archive etc. to support new forms of discussion

MEDGING

- "networked intellectual" as opposed to public intellectual.
- participatory transformational model via I.T.
- personal data stores - data integration
- greater integration of disciplines
- how do we make sense of hetero generated data?
- how do we show what is invisible? what decisions we made about know. production?
- public policy initiative on wikipedia
- functional ways for an individual to control personal data
- do needs around personal disclosure vary across areas/disciplines
- "output" crowd-sourcing...
- crowd sourced or networked contributors to know.
- can we facilitate use of IT for public dialogue/discourse? Role for I.S.?

RECONFIGURATIONS

- meta tagging? making knowledge production trajectories visible can we do this in culturally sensitive ways?
- Reconfigurable of how fields are caused by funding
- more practical partnerships w/ NGOs, etc.
- learning from students who use new forms of info/performance activity
- critical analysis/thinking systematic methods than tacit knowledge not a critical practice smaller...
- The University organize @ problems? more fluidly?
- undergrad humanities education - students re-tact publish content
- research central getting under the hood of obs...
- QUALITY of INFO? hierarchy of info. networks of trust

IMAGINED

- University that isn't full of I.O.s on own
- ENGAGE in crowd-sourcing?
- Reward systems that reflect the emergent norms of contribution to knowledge
- is interoperability of data a problem + if so when + where? some disciplines are used about it; others - not so much...
- we aren't reading each other (e.g. archivists don't read us; we don't read them).
- SEPARATION of tech disciplines from humanities & social science....
- Ethical dimensions of free labour?
- info science - how can it remain relevant? how do we situate in relation to in/out of university?
- problems that require interdisc. work problems that have public relevance can info sci mediate? can it define data? to what ends/practices/forms?
- data - is it an adequate concept? discourse vs. data? discourse anal. of databases semantics in I.S.
- I.S. isn't adequately bridging social science humanities - still have to talk science to NSF
- Why aren't we producing public intellectuals? Why are we \$ machines but not critical thinkers @ how to critique data? data librarians
- info across all disciplines - need to get interpretation issues into all domains.

GRAND CHALLENGES

MAXIMUM
SYNERGY
BETWEEN
DISCIPLINES

★ Restructure Universities to make more interoperable disciplines + more public engagement

★ create technical idea of data that is flexible enough to permit power sharing of multiple + incommensurable ways of knowing.

★ The university needs to be restructured to support interdisciplinarity and public discourse with the public in a *frictionless* way.

Institutional Issues - Part

★ generate public support by connecting academic disciplines to address problems of public interest

★ X + Info Science (X = any discipline)

CRITICAL MASS OF RESEARCH
\$, consistent funding
Technical Core (Computing, Math, HCI)

Research requires
- critical mass of \$\$\$
- consistent funding
- technical core
Resources:
\$
People - time - HOPE

★ create new language that integrates into separate + both disciplines

★ create a new language that integrates into separate + both disciplines

GRAND CHALLENGES

MAXIMUM SYNERGY BETWEEN DISCIPLINES

Serious role of non-human actors

Research into the materiality of digital technologies, etc. (coffee, energy, etc.)

how can "user-generated" be integrated into formal schemas

New Forms of Hegemony. What role does hegemony play in this discourse?

Role & dominance of incumbent interests in shaping the discourse of research.

HOW TO DESIGN AN ARENA WHERE POLICIES FOR THE FUTURE CAN BE DEBATED?

POINT OF VIEW - How to account for it?

What are the limits of data-mining/big data? What role can ethnography still have?

PROFILES (AND CONSEQUENCES) AS RESOURCES FOR EXPLORATION OF DATASETS.

Data Quality

how can we integrate notions of performance? (= embodiment)

Politics & Problems of Data Mining.

Landfills as repositories (and vice-versa)

Costs/Benefits of "Saving Everything"

Is 'stuff' Authentic? How do we know?

How do we take care of 'stuff' to keep accessible.

How are play & leisure key rubrics for this conversation?

how can we creatively think about forms of research dissemination

ETHICS & VALUES

Rights/Responsibilities Roles in the emerging information age

The generational divide? Myth? Manifested how?

Is there any equilibrium that makes this period out of equilibrium?

What is the training of the new literacies?

Visual academic production

Ethics & Values

HOW TO TEACH (TRANSMIT) UNCERTAINTY?

GRAND CHALLENGES

