



The 21st Century Research Infrastructure and SHARE: Challenges and Opportunities

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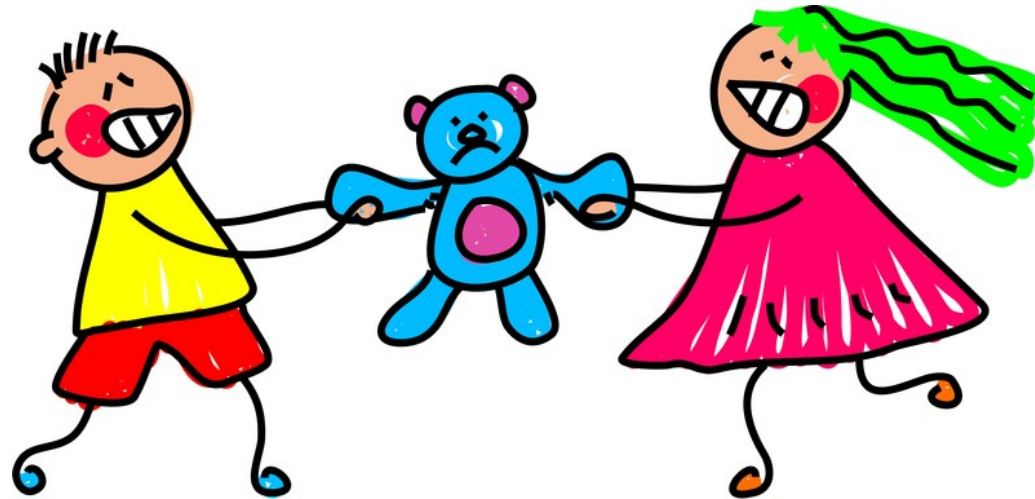
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The Notion of SHARE-ing

- Humans are **naturally selfish**, even as infants, and **not sharing** is an innate behavior we exhibit at a very early age!



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The Notion of Sharing

- The academy encourages **collaboration** but still tends to evaluate and reward **individual** achievement – thus reinforcing at least caution in sharing



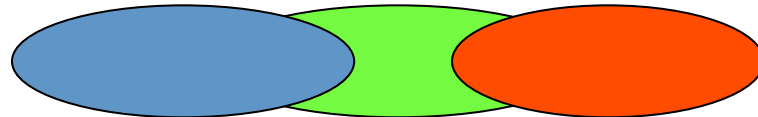


The Research Spectrum

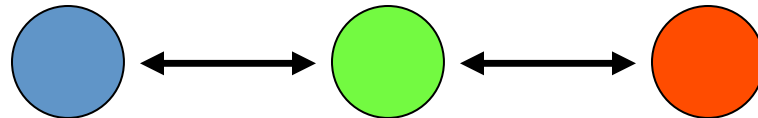
Transdisciplinary



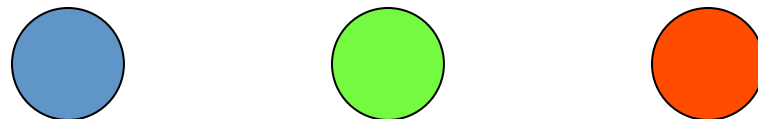
Interdisciplinary



Multi-Disciplinary

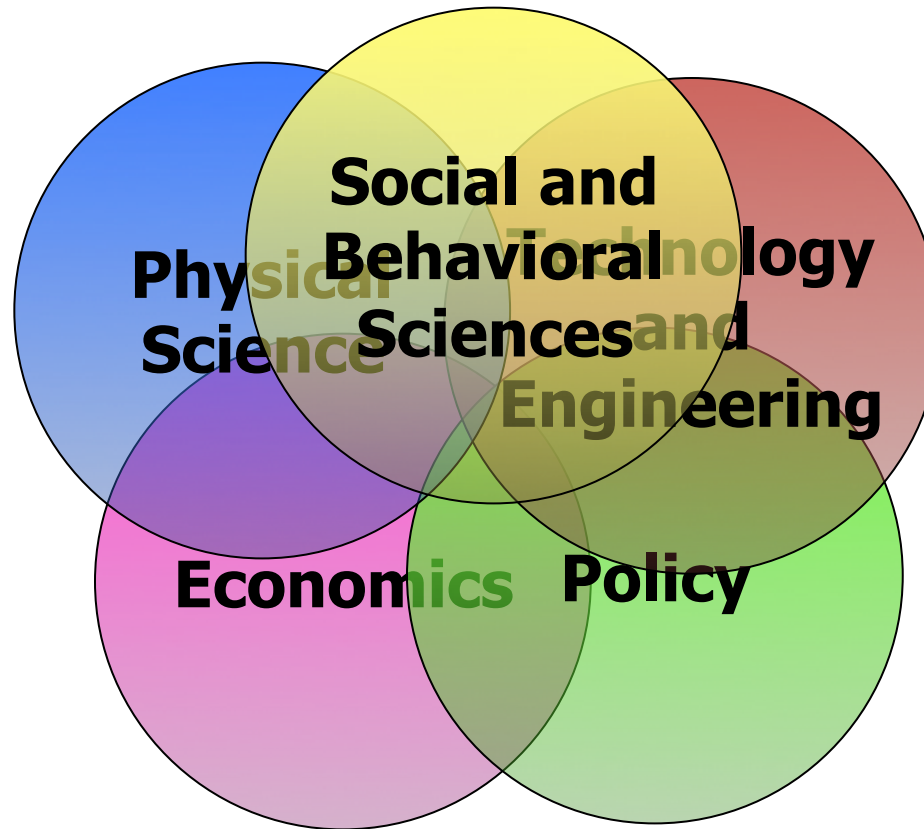


Disciplinary





Research at the Boundaries



Share will help (force) us to more quickly and effectively develop common vocabularies and build trust among researchers across disciplines



The Value Proposition of Open Data Access

- In Research
 - **Replication/reproducibility** of previous results
 - New **interpretation** and **analysis to scale for heterogeneous data sets** – an **open market** approach
 - Opportunities for **collaboration**, probably numerous and multi-disciplinary
 - **Follow-on** studies and thus faster progress
 - Identification of unknown **problems**
 - Greater **accountability** and responsible conduct of research
 - Research experience in **K through 16**
 - **Credit** for gathering/generating/making available data



The Value Proposition of Open Data Access, continued

- In Teaching
 - Online and engaged **learning**
- In Economic Development
 - Corporate **R&D** to use in **analytics**



The Challenges of Open Data Access

- Misuse of data owing to misunderstanding → battles about results
- Burden on researchers to explain data, deal with access problems
- Applying analytics to mine vast amounts of information and make sense of it
- Misappropriation of credit



View from a Vice President for Research, Point 1

- **Key Point #1: Facilitating Research With Data**
 - A means to tackle some of the most compelling intellectual challenges at the intersections of multiple disciplines
 - It's not only about providing access but also helping ensure **EFFECTIVE** use of data – which is not automatic!
 - The institution must help: bring people together, stimulate conversations, bridge language barriers, build trust, guide thinking, provide support



View from a Vice President for Research, Point 1, cont.

- **Key Point #1: Facilitating Research With Data**
 - Library has a unique role to play – a renaissance as the intellectual commons of our campuses
 - As IT has opened new doors and brought people/ disciplines together, so can the “data challenge” if we handle it properly!
 - Especially critical for engagement of social sciences and the humanities



View from a Vice President for Research, Point 2

- **Key Point #2: Providing Credit and Support**
 - System (but importantly also a philosophy) for giving credit to faculty for generating, maintaining, and provisioning data (similar to how IP has been added to portfolio)
 - Provost, Deans, Tenure Committees, Senior Faculty
 - Building data stewardship into research metrics aka citations, impact factors, etc
 - Creation of persistent identifiers/tags (EZID, DataCiteConsortium) – but also WHAT credit means
 - Creation of an indirect cost component for data and compliance



View from a Vice President for Research, Point 3

- **Key Point #3: Logistics and Cost**
 - Coordination and consolidation of data management approaches across the institution: Provost, Library Dean, CIO, VPR
 - Appropriate cyberinfrastructure, security, systems-level approach
 - Integration into the broader academic ecosystem
 - The strategies in which we invest today may be quite different in a short time – shifting sands
 - Division of responsibilities (local and national)
 - When will the dust settle regarding policies?
 - Unity versus diversity in approaches



Assessing Impact

- **Assessing impact** is critical if we are to understand the real benefits (and possible drawbacks) of open data access
 - We must link assessment to value proposition points described earlier and be open to new ideas of measuring value (e.g., drawing in underrepresented groups to STEM fields, creation of new domains such as digital humanities)
- Assessment also is critical for **modifying policies** to create even greater benefits and address drawbacks



Blue Sky Thoughts: Caution

– A Forecast from a Meteorologist!

- Open data will generate **completely new models for collaborative interaction** – a new “social media” in research centered around sharing, not simply communicating. This will lead to **new tools and approaches** (e.g., Tableau)
- **New disciplines** likely will arise when researchers from one discipline start “playing around” with data from others, and these new perspectives will reveal new insights, **solve longstanding problems** and raise new questions. The “Fourth Paradigm.”



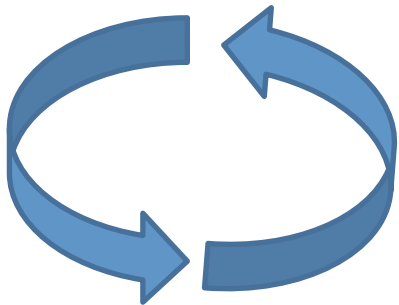
Blue Sky Thoughts: Caution – A Forecast from a Meteorologist! continued

- The entire notion of a **“publication”** will change, leading to open-ended **online research release events** in which new analyses and data will continually be added to previously reported outcomes, creating branches and forks in time, with other disciplines linked in a virtual intellectual commons
- Access to data, and tools for analysis, will enhance interest and exploration by **children** and offer greater opportunity to **increase participation** by traditionally underrepresented groups

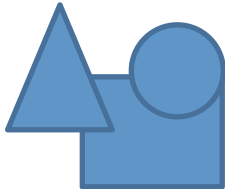


The End Game for Research

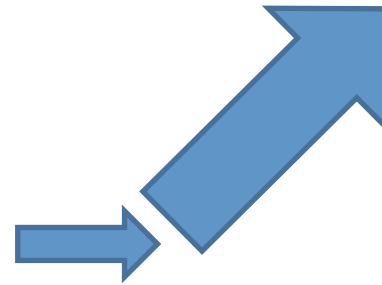
- SHARE will enable NEW and better ways of doing old things + lots of NEW things



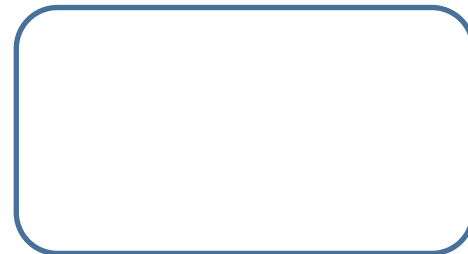
Reproducibility (repeat/verify)



Collaborability (across)



Extensibility (extend/expand)



Creatibility (frontier)