



Stanford | LIBRARIES

**Research Information
Ecosystem
& RIALTO, a Research
Intelligence System for**

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@tcramer

CNI * April 12, 2018



A Purposeful University



Marc Tessier-Lavigne,
Stanford Inaugural Address
October 21, 2016

“I believe great research universities are a source of light and hope.

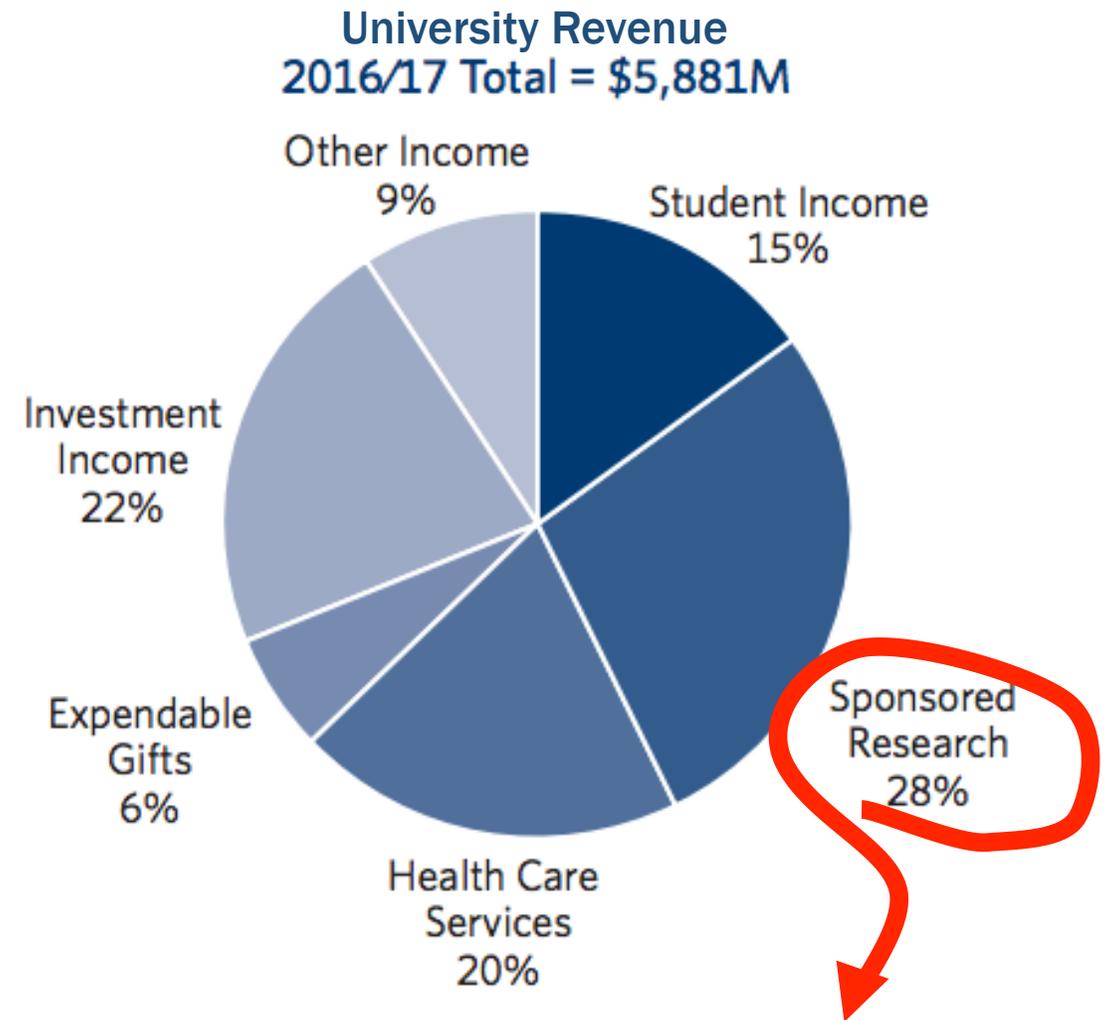
They are purposeful in advancing knowledge and human welfare. They are custodians of humanity’s heritage and engines of societal development. They are a major force in maintaining the world’s upward arc of progress.

A purposeful university ...promotes and celebrates excellence ...as a means to magnify its benefit to society.”

What is Stanford's
research output?

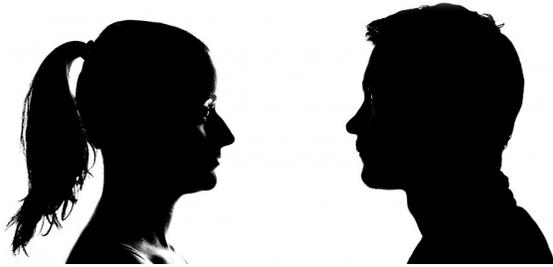
Stanford Statistics

- 2,180 faculty members
- 9,304 graduate students
- 7,032 undergraduates
- 6,000+ sponsored projects
- 18 independent labs, centers & institutes
- \$94 million from 779 licensed technologies
 - 141 new licenses in 2015-16



**\$1.6 billion
research
budget**

Stanford Knows...



WHO



HOW



~~**WHAT**~~



Stanford Baseball Team, undated



<https://purl.stanford.edu/qx454wd5357>

A baseball team with

- the line up and
- schedule,
- personal stats,
- **but no team scores?**

Staff of The Stanford Daily in 1926



<https://purl.stanford.edu/zt289hb8261>

A newspaper with

- Staff, articles and daily readers,
- **but that doesn't track circulation or keep any back issues?**

Knowing the What Increasingly Matters

- General awareness
- Reporting
- Demonstrating impact
- Trend analysis
- Rapid response
- Compliance with mandates & policies
- Research networking / enabling collaborations

Real Life Questions

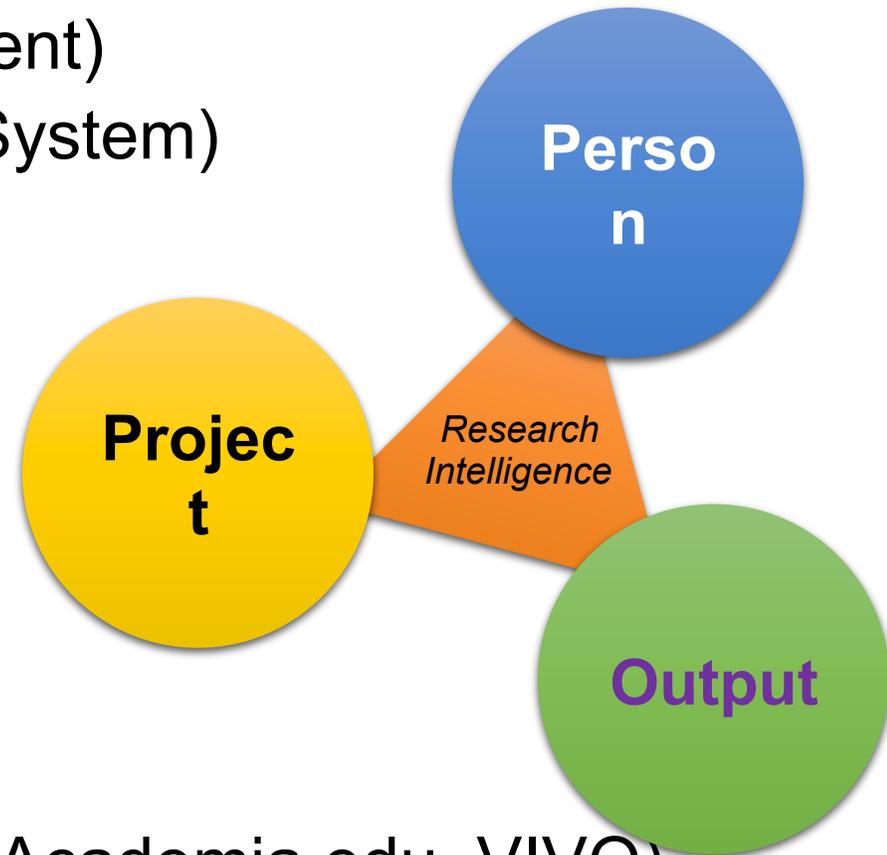
- What research has Stanford produced? In the last 10 years?
- What is the activity of Stanford researchers after they have left?
 - Reporting on CTSA (Clinical and Translational Science Awards) from NIH requires publication data, often for post-docs & residents after they move to another institution
- What research has emerged from cross-disciplinary centers at Stanford?
- How many times has Stanford research been viewed / cited?
- Where are Stanford researchers doing their projects?
 - Who at Stanford has projects in countries affected by the travel ban?
 - Who might also be gathering temperature and rainfall data in an area?
 - Who are we doing work with, internationally?

Closer to Home

- Why do faculty have to enter publications data three times (into Profiles, a BioSketch and annual activity reporting)?
- Can researchers get automated notifications of relevant funding opportunities based on previous research & collaborators?
- What are the current areas of research that should guide library acquisitions?
- What journals are most important?
 - Cited by Stanford authors; publishing Stanford research
- What research proposals have data management plans?
- What research projects have data or reports to deposit into SDR?

Flavors of Research Intelligence Systems

- RIM (Research Information Management)
- CRIS (Current Research Information System)
- RNS (Research Networking System)
- RPS (Research Profiling System)
- FAR (Faculty Activity Reporting)
- Research Analytics
- Research Evaluation



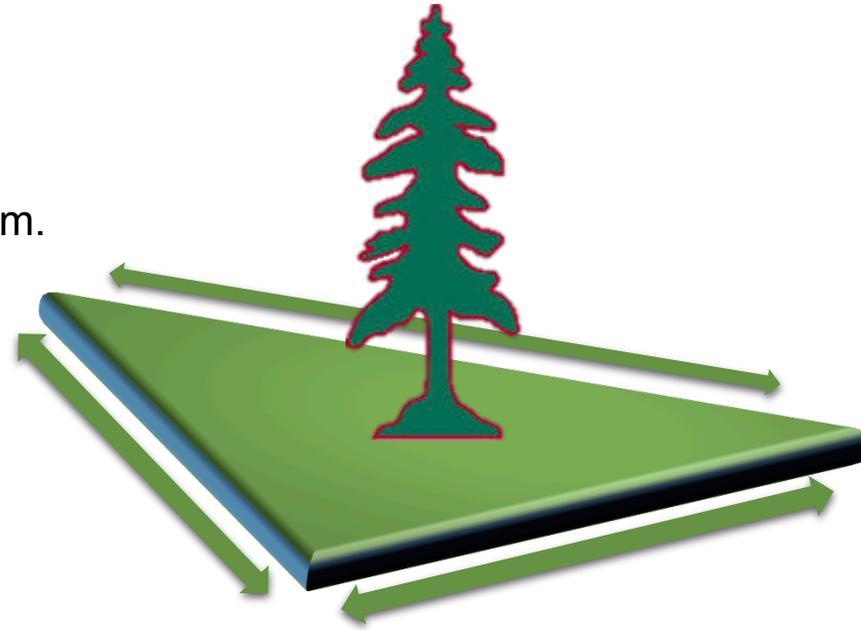
NOT:

- Profiles systems (like Research Gate, Academia.edu, VIVO)
- RDM (Research Data Management)

Stanford's "Research Core"

SeRA

Stanford Research
Administration system.
Propose & manage
grants



Profiles (CAP)

Researcher bios and
networks; dashboard for
research activity (future)

Stanford Digital

The SDR serves to capture, preserve and provide access
to the University's research output and contributions to the
scholarly record.



RIE: Research Information Ecosystem

Who: Dean of Research

+ Libraries

+ Office of Research Administration

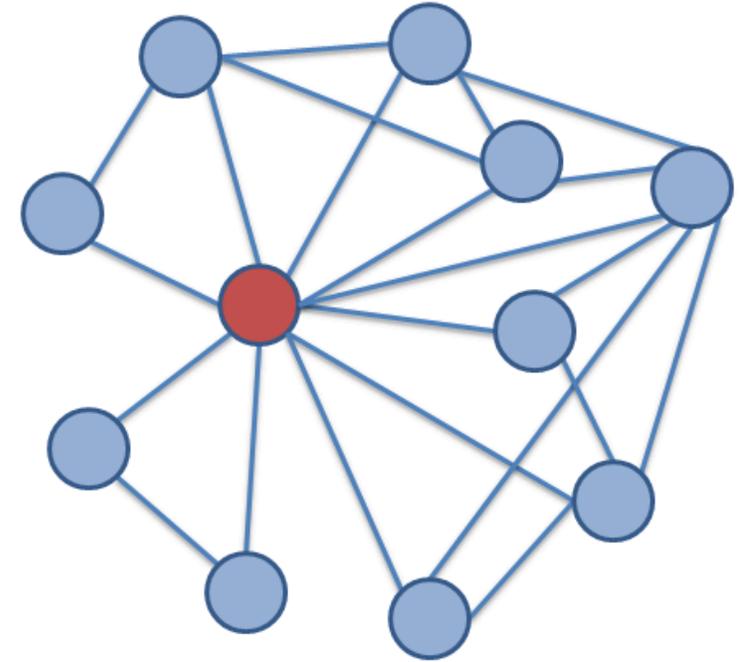
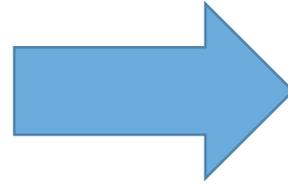
+ University IT

Objective: Enhance faculty research & scholarship at Stanford

How:

- Open, internal data exchange
- Reduce data friction & reentry
- Increase creative & analytic opportunities
- Leverage data *already in the University*

From “Cylinders of Excellence” to a Network



Example 1: Publication Data + Profiles

Publication data harvested and managed by the Libraries

Direct link to full text and data sets in the SDR (potential development)

The screenshot shows the Stanford Profiles page for Ann M. Arvin. The page has a dark red header with the text "Stanford | PROFILES" and a search bar. Below the header is a navigation bar with tabs for "BIO", "RESEARCH & SCHOLARSHIP", "TEACHING", and "PUBLICATIONS". The "PUBLICATIONS" tab is selected. The main content area is titled "All Publications" and lists several publications. The first publication is "The Glycoprotein B Cytoplasmic Domain Lysine Cluster Is Critical for Varicella-Zoster Virus Cell-Cell Fusion Regulation and Infection" in the *JOURNAL OF VIROLOGY*, published in 2017; 91 (1). The authors listed are Yang, E., Arvin, A. M., and Oliver, S. L. A red arrow points from the text "Publication data harvested and managed by the Libraries" to the list of publications. Another red arrow points from the text "Direct link to full text and data sets in the SDR (potential development)" to a red oval around the author names in the first publication entry. On the right side, there is a sidebar titled "PUBLICATIONS (315)" which contains a list of publication types: "All Publications (315)", "Featured Publications (16)", "Journal Articles (277)", and "Conference Proceedings (38)". This sidebar is circled in red. Below the sidebar, there are profiles for other researchers: Cornelia L. Dekker, M.D., Charles G. Prober, MD, and David B. Lewis M.D.

Example

2: SeRA + SDR

*Ticklers to deposit
research data /
articles / reports to
SDR for
preservation &
access (and grant
compliance)*

*Intelligence on
upcoming grants
with data
management
requirements*

Stanford | SeRA

Search Navigate Help TCRAMER

Home

My Projects

Pipeline

Proposals

Reports

Advanced Search

Navigate to

The SeRA Tau Release went live on May 13, 2017. Release notes and highlights sheet available on the [SeRA News and Updates page](#).

My Projects

+ Initiate New Proposal Jump to

- Action Items [0]**
Items requiring action specifically by you
- Activities In Progress by Others**
Items being worked on by others for your active projects
- Submitted Proposals Pending Award**
Proposals which have not been awarded yet
- Research Profile**
Your recent activity, awards and compliance training status
- Project Awards Closing**
Financial awards that are in the closeout process
- Proposals**
Proposals PDRFs in the development process
- My Accounts**
Overview of financial information on your active accounts
- Active Awarded Projects**
Active projects which list you as an investigator or mentor
- Pipeline**
Items you worked on and now assigned to another person to act
- Other Support Report - NIH**
Current & Pending Support in the NIH Format
- Other Support Report - General**
Current & Pending Support in the General Format

Example 3: Research GeoData to GoGlobal

Stanford's Office of International Affairs tracks, promotes & facilitates Stanford's engagement in countries across the world.

Stanford University

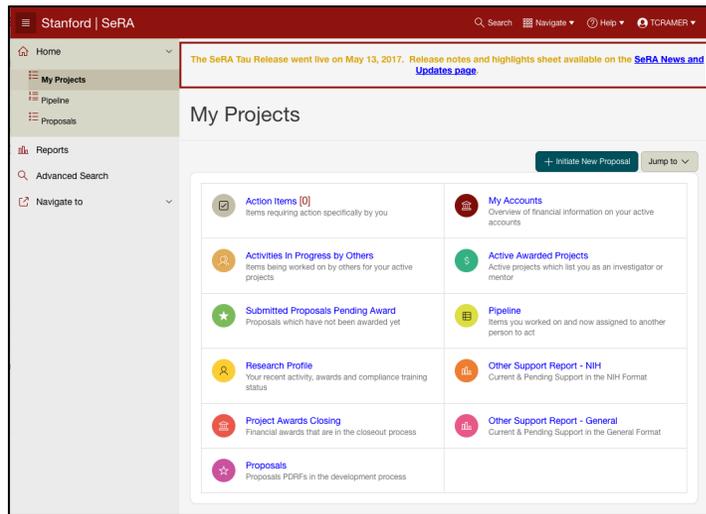
GO GLOBAL Research Learn Explore News Events

Global Explorer View as List Search

Office of International Affairs, Stanford University
Wallenberg Hall, suite 239, 450 Serra Mall, Bldg. 160, Stanford, CA 94305
Phone: 650-723-3016 or 650-723-3174
Terms of Use Copyright Complaints

Example

4: SeRA, STARS, and EH&S



SeRA
Research Administration



BIOSAFETY & BIOSECURITY

EH&S
Environmental Health &
Safety

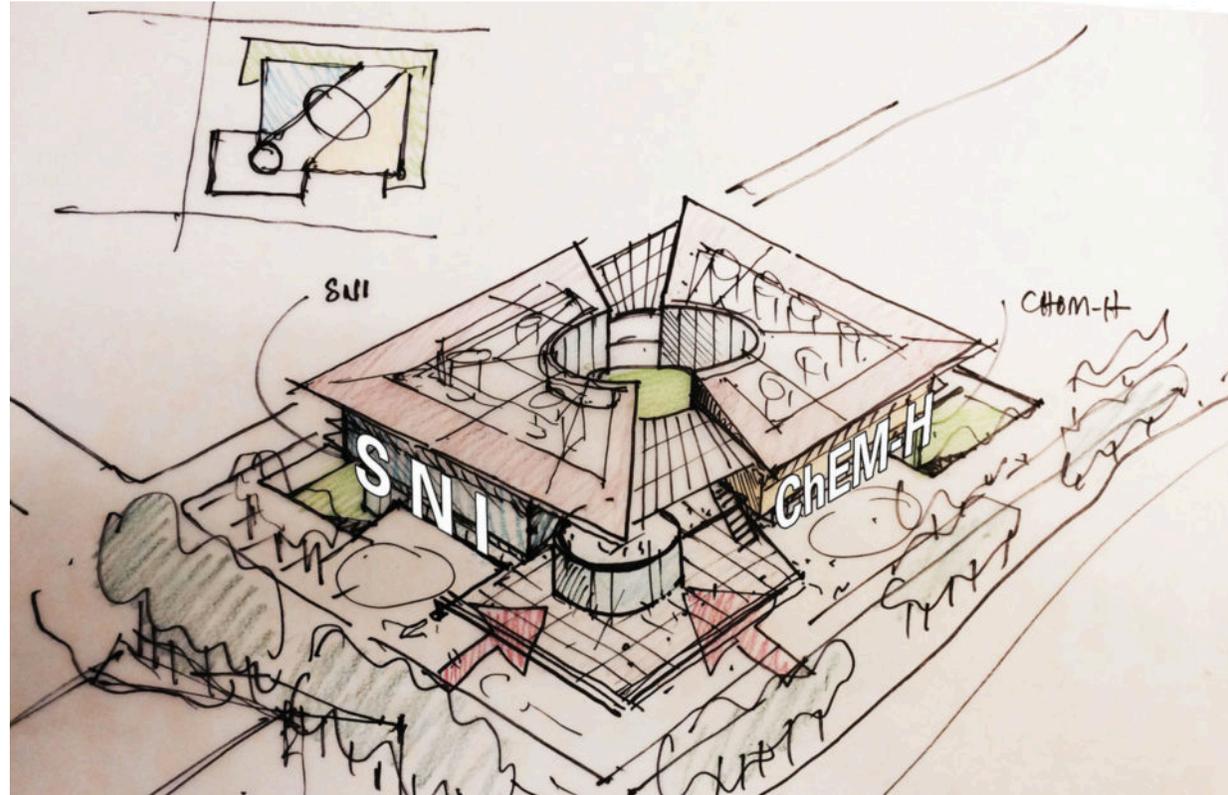
Course Name	Course Description
Bloodborne Pathogens (EHS-PROG-1600)	SU employees with the potential for workplace exposure to bloodborne pathogens environment must by law receive special training. This program provides methods of protecting yourself from potential exposure to bloodborne pathogens in your workplace.
Fire Extinguisher Use and Inspection (EHS-3850)	An online video covering fire extinguisher use, classification according to fire type, and inspection to ensure readiness.
Orientation for Lab Safety Coordinators (EHS-5200)	Training for lab safety coordinators and lab managers. Prereqs: EHS 4200, and EHS-1900. Provides information on how to conduct and coordinate lab health and safety tasks assigned by lab manager or PI.
Working Safely with Biohazardous Agents in Lab Animals at the VA (EHS-PROG-5280)	This course is required for lab employees at the VA who work with biohazardous agents in lab animals. Training consists of 2 classes: EHS-5280-WEB (a video), and EHS-5281, a classroom discussion held by the EHS Biosafety Specialist.
Working with Biohazardous Agents in Lab Animals at the VA (EHS-5281)	This classroom discussion is scheduled with the EHS Biosafety Specialist for Laboratory Workers at the VA who work with biohazardous agents in animals. Note: completion of EHS-5280-WEB is a prerequisite.
XTesting Item 2 for Robert Edgar (EHS-9901)	Second testing item for Robert Edgar.

STARS
Training System



Example 5: Space Planning

Planning office & lab allocation based on collaboration data extracted from RIALTO and Profiles.



SNI & Chem-H

Designed to innovatively co-locate two emerging research institutes – Stanford Neurosciences Institute and Stanford Chemistry, Engineering Medicine and Human Health (ChEM-H),

Q: What is Stanford's Research Output?

Stanford is a research enterprise.

SeRA manages grants administration.

Profiles & PeopleSoft manage person information.

SDR holds digital assets (but not all research artifacts).

Where & how do we track the University's research output?

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A:

RIALTO
RESEARCH INTELLIGENCE



RIALTO is being developed by SUL

- As a **database**, it captures and relates information on research artifacts (articles, data and more), research activities (grants/projects), and the people and groups who do them.
- As a web **application**, it provides intelligence and reporting on Stanford's research activities and output.
- Through its **integration** to other campus systems (e.g., Profiles, SeRA, SDR, etc.), it produces and consumes information vital to Stanford's research core systems.
- Through its campus **APIs**, it supports visualizations and data mining for special purpose and ad hoc needs.
- Through **linked data**, it is Stanford's face to the Web of Data.

RIALTO

Relate

Report

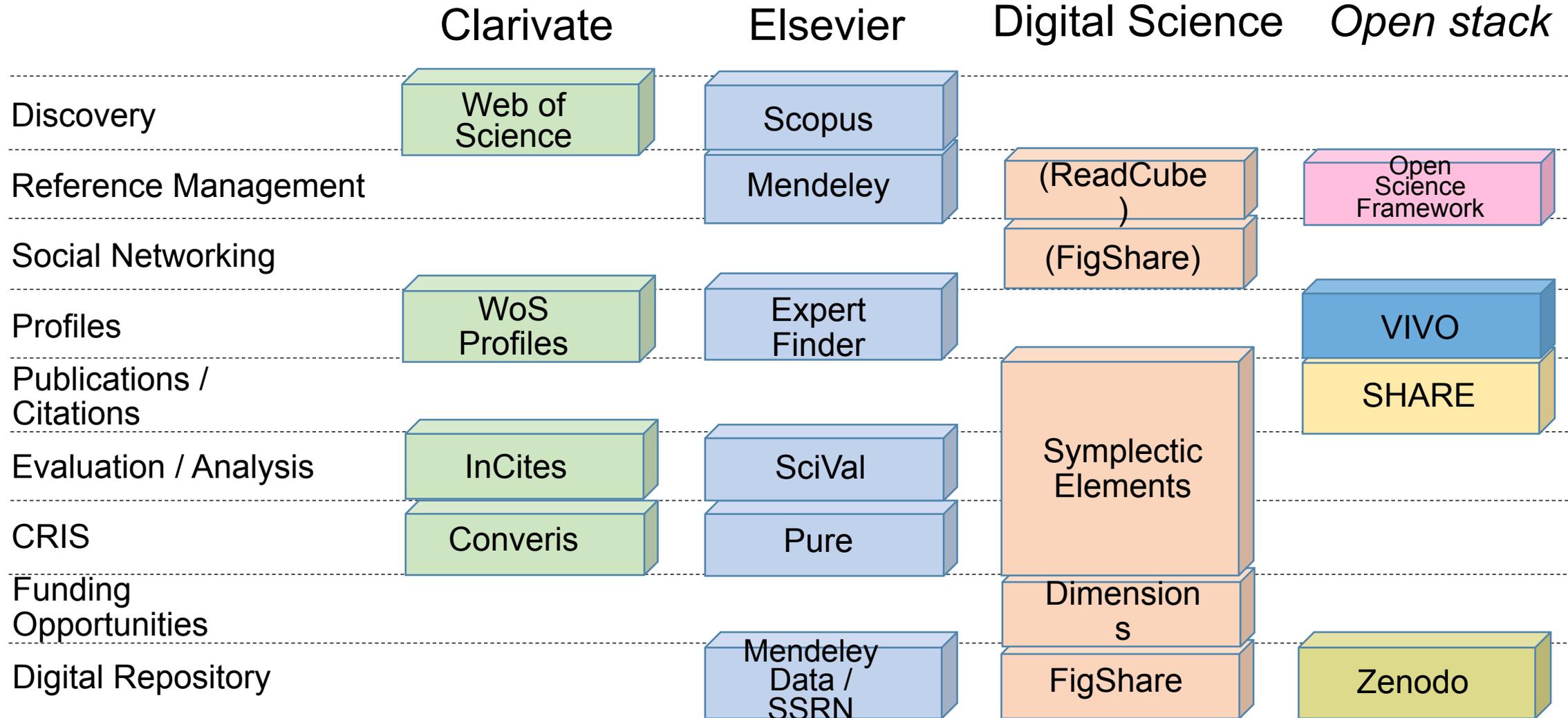
Reuse



Emerging Verticals

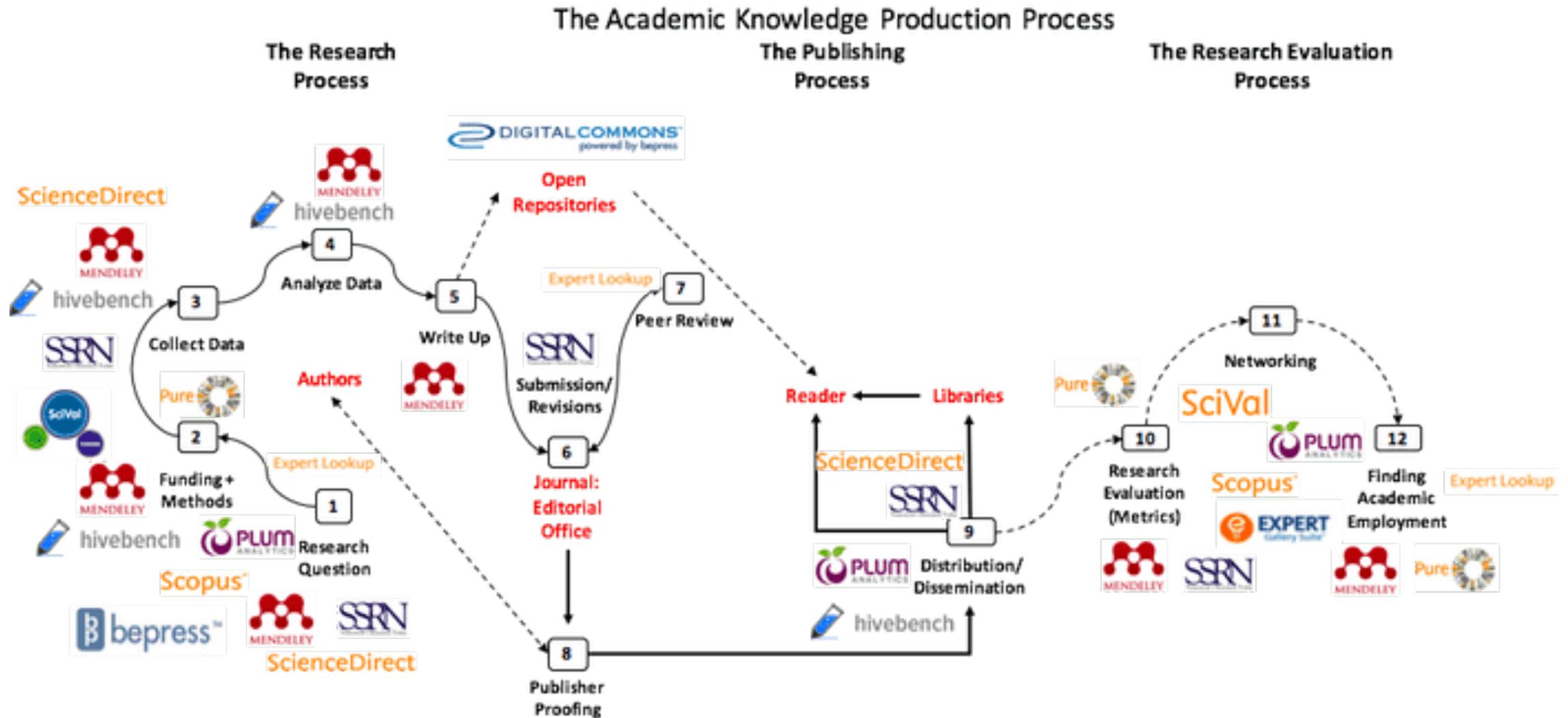
Point Solutions of Note:

- Academia.edu
- Research Gate
- ORCID
- CrossRef
- Google Scholar



Posada & Chen: Elsevier's Growing Position

<http://knowledgegap.org/index.php/sub-projects/rent-seeking-and-financialization-of-the-academic-publishing-industry/preliminary-findings/>



Research Intelligence: Stories from Stanford

- As a university administrator, I need to understand the impact of cross-disciplinary institutions on research impact so I can assess their ROI
- As a university administrator, I want to measure the impact of research on student publications so that I can understand which faculty members and granting agencies produce the most student publications
- As a university administrator, I need to know which publications resulted from which grants so that I can fulfill reporting requirements to funding agencies
- As a department administrator, I need to know how many publications are being produced by each department so that I can report this information
- As a subject or data librarian, I want to be able to track incoming awarded grants so that I can talk to researchers about their data preservation and resource needs
- As the Director of the Office of International Affairs, I need to be able to map Stanford faculty members' international co-authors by institution so that I can make strategic decisions about potential university-wide partnerships.
- As an administrator, I need to understand how the use of building resources and assignments to rooms affects productivity and output

In other words...

- Reduce administrative burden
- Feed Profiles, CV and BioSketch systems
- Simplify faculty activity reporting
- Report and analyze activities
- Capture evidence of impact; calculate ROI
- Evaluate existing collaborations and find new ones
- Analyze funding (output, collaborators, trends)
- Support library selection/collection development and consulting

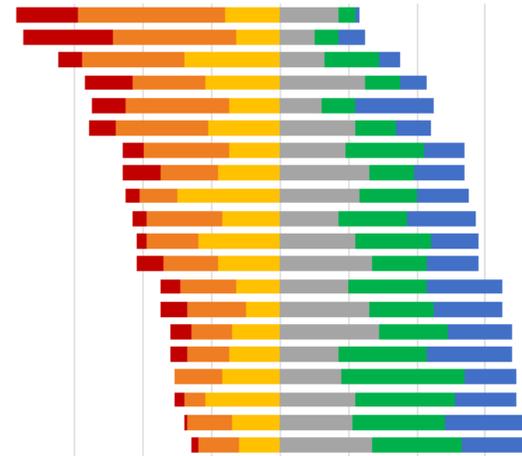
Implications for the Library



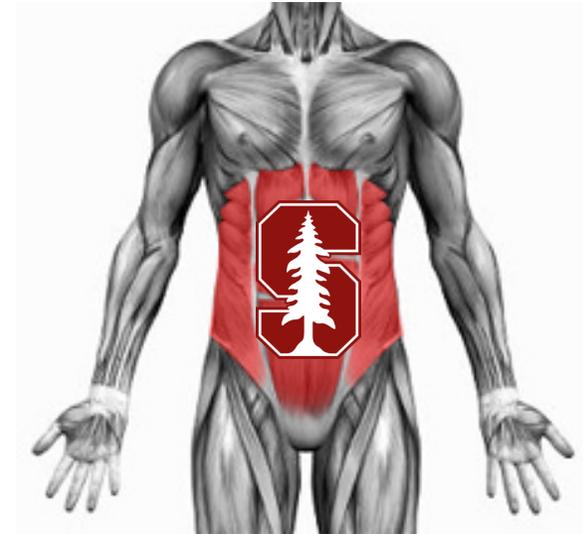
Research
outputs



Up and
Downstream
m



Information
and
Intelligence



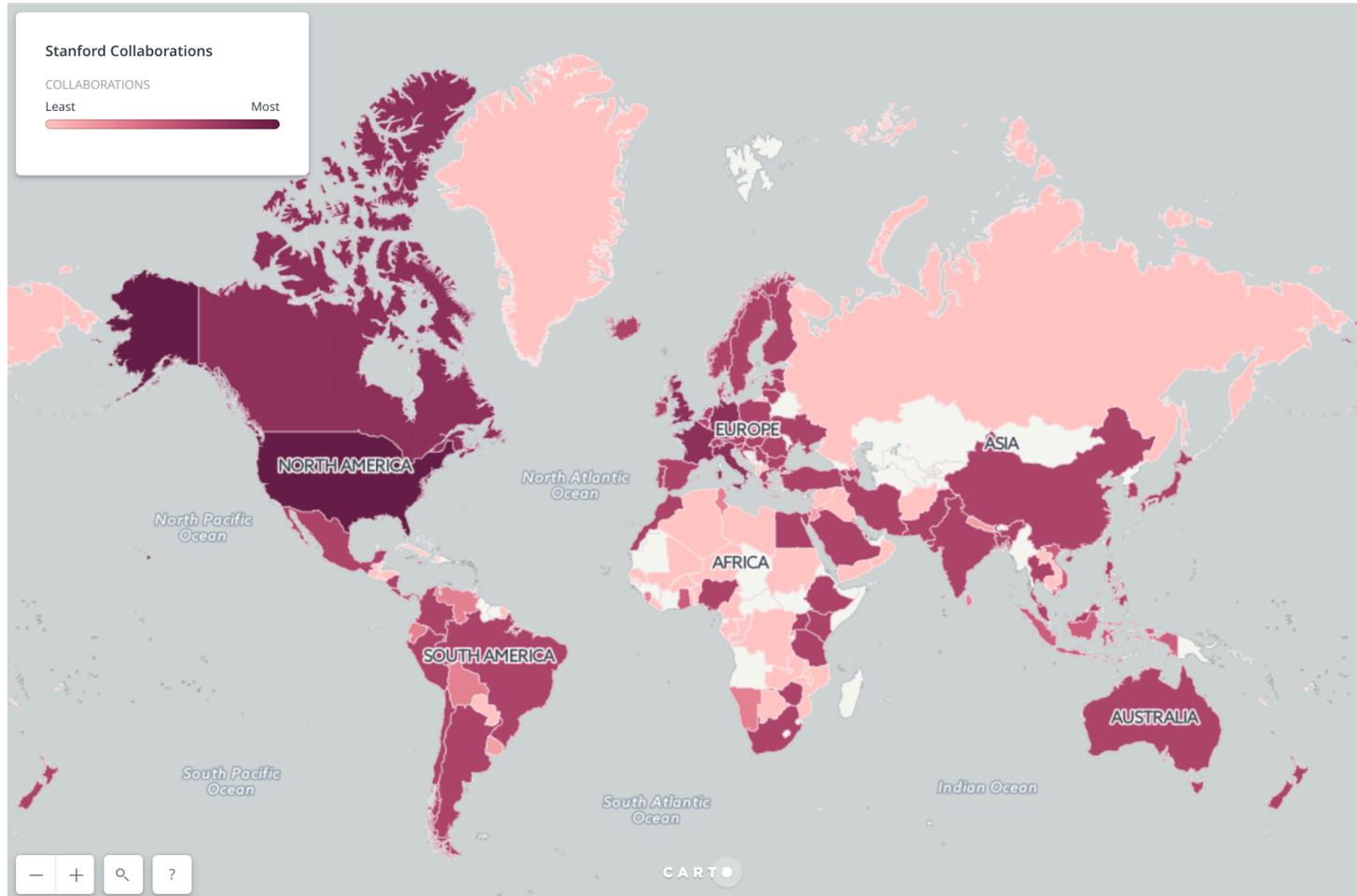
Part of
Stanford's
Research
Core

Case Study: Fostering International Research

“I was at a meeting for the Academy of Sciences recently about ‘barriers to international research,’ and multiple faculty members stated wistfully that it would be amazing if we could map, or at least count, the international co-authors of Stanford authors as a case for how important international researchers are to Stanford.”

“Do you think it would be possible to design a RIALTO query that could surface co-authors from non-US institutions?””

3 Data Runs Later



Holy...

Peter, I've been waiting 6 yrs for what you did in less than a week! This is the richest data set about our global research footprint that we have ever produced, bar none.

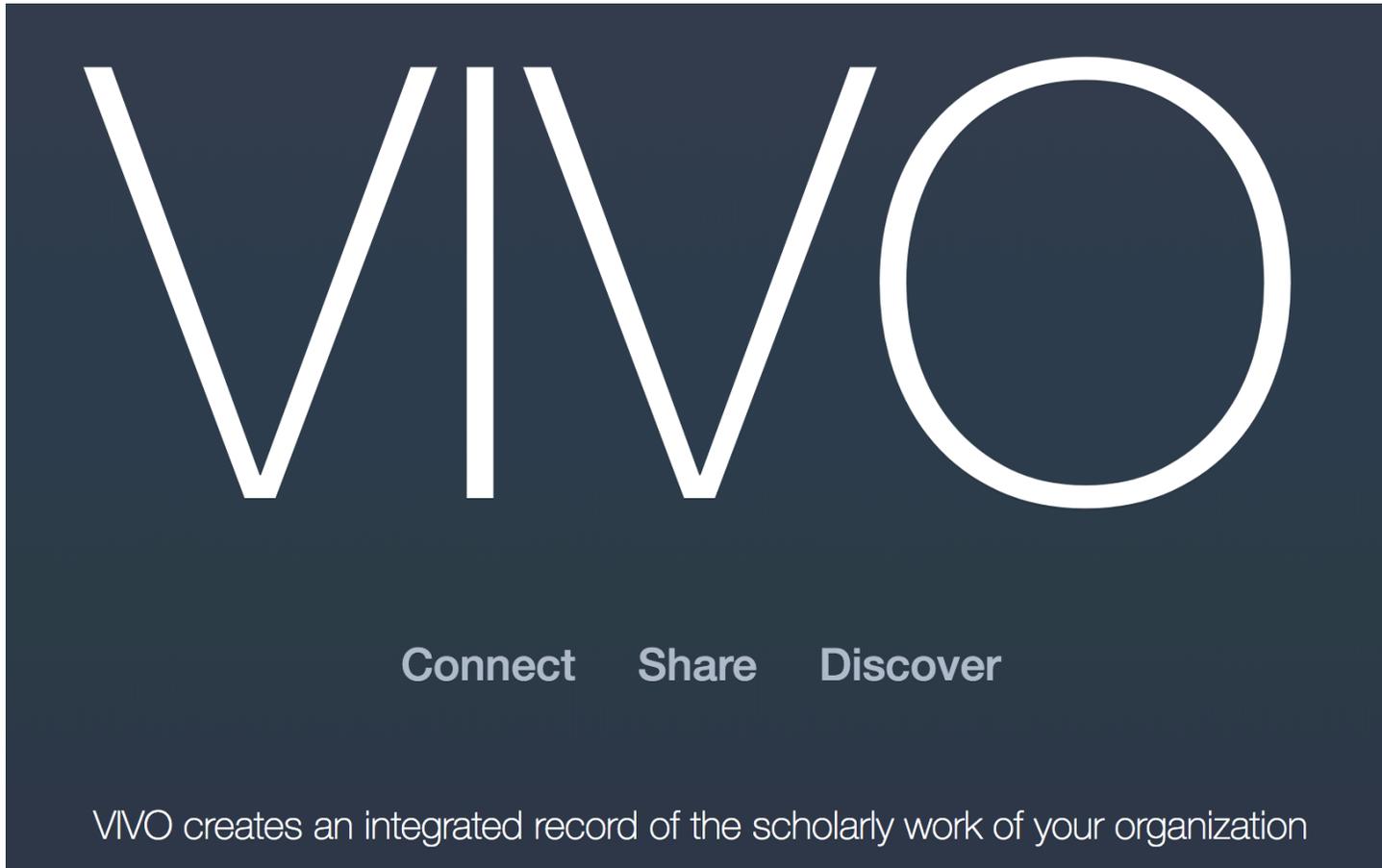
Discussion

- What have we missed so far?
- Where & how are you getting data on research output?
- Who is using this data at your institution?
- Where are you going for discussion & progress on research intelligence?

6 Needs in an Immature Field

1. to understand research intelligence sources, needs and value.
2. a holistic appreciation of institutional data – from both internal and external sources.
3. to capture data automatically.
4. to form new partnerships within the institution
5. to create a free-flowing marketplace for research intelligence data and systems
6. to form a community of practice

VIVO & VIVO Combine



9th Annual VIVO Conference
June 6-8, 2018