

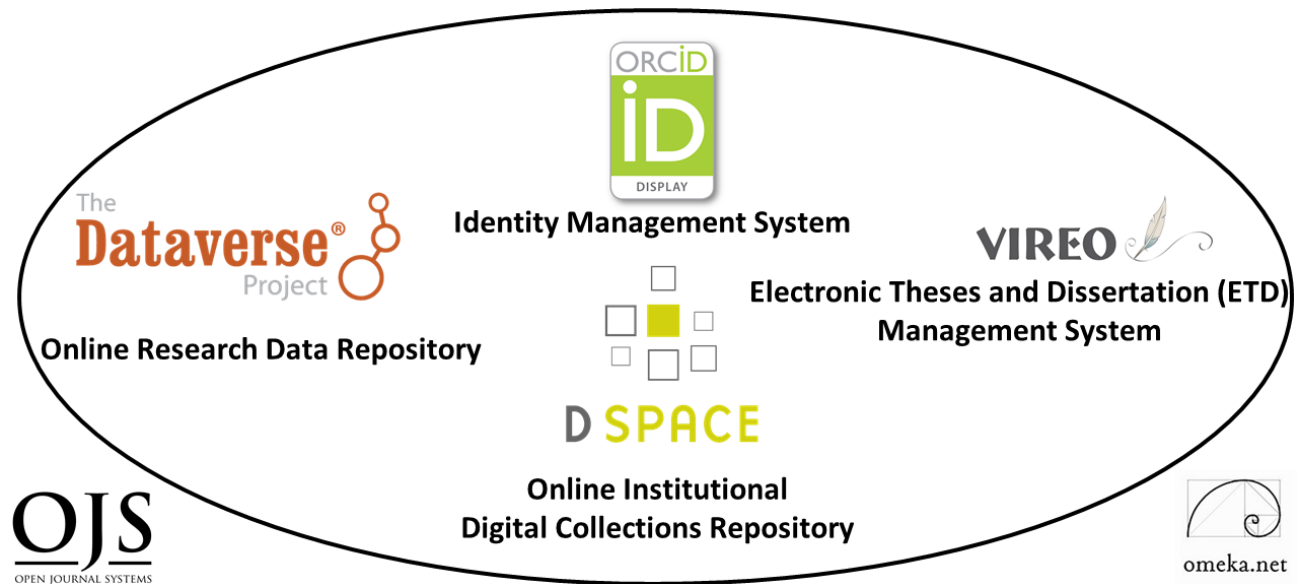
Ray Uzwyshyn, Ph.D. MLIS
 Director, Collections and Digital Services
 Texas State University Libraries

Developing an Open Source Digital Scholarly Research Ecosystem Local and Global Possibilities

A large circular inset containing three logos. At the top is the ORCID iD logo, which consists of a green square with "ORCID" in white, "iD" in white on a green background, and "DISPLAY" in white on a green background. Below it is the "Identity Management System" text. To the left is an orange logo consisting of three circles of varying sizes connected by lines, with the word "Repository" below it. To the right is a logo consisting of a central yellow square surrounded by several white squares, with the word "Elect" to its right. Below these is the "DSPACE" logo, where "D" is grey and "SPACE" is yellow. At the bottom is the text "Online Institutional Digital Collections Repository".

What is a Digital Scholarly Research Ecosystem?

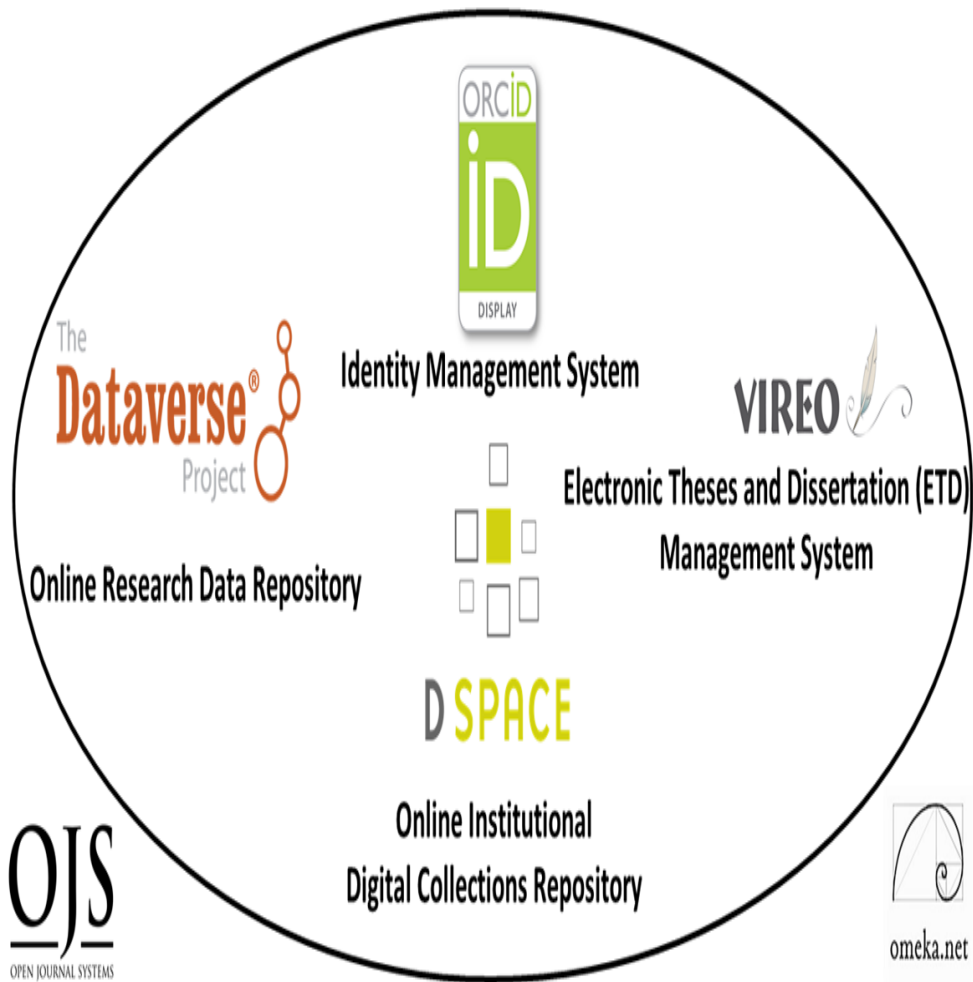
Ecosystem of Several Software Components to Enable Faculty and Student Research



Ecosystem Metaphor Look at Relationships in the Digital Environment

Specifically Focuses Upon the Discrete Component Relationships with the Networked Digital Environment

Six Main Software Components



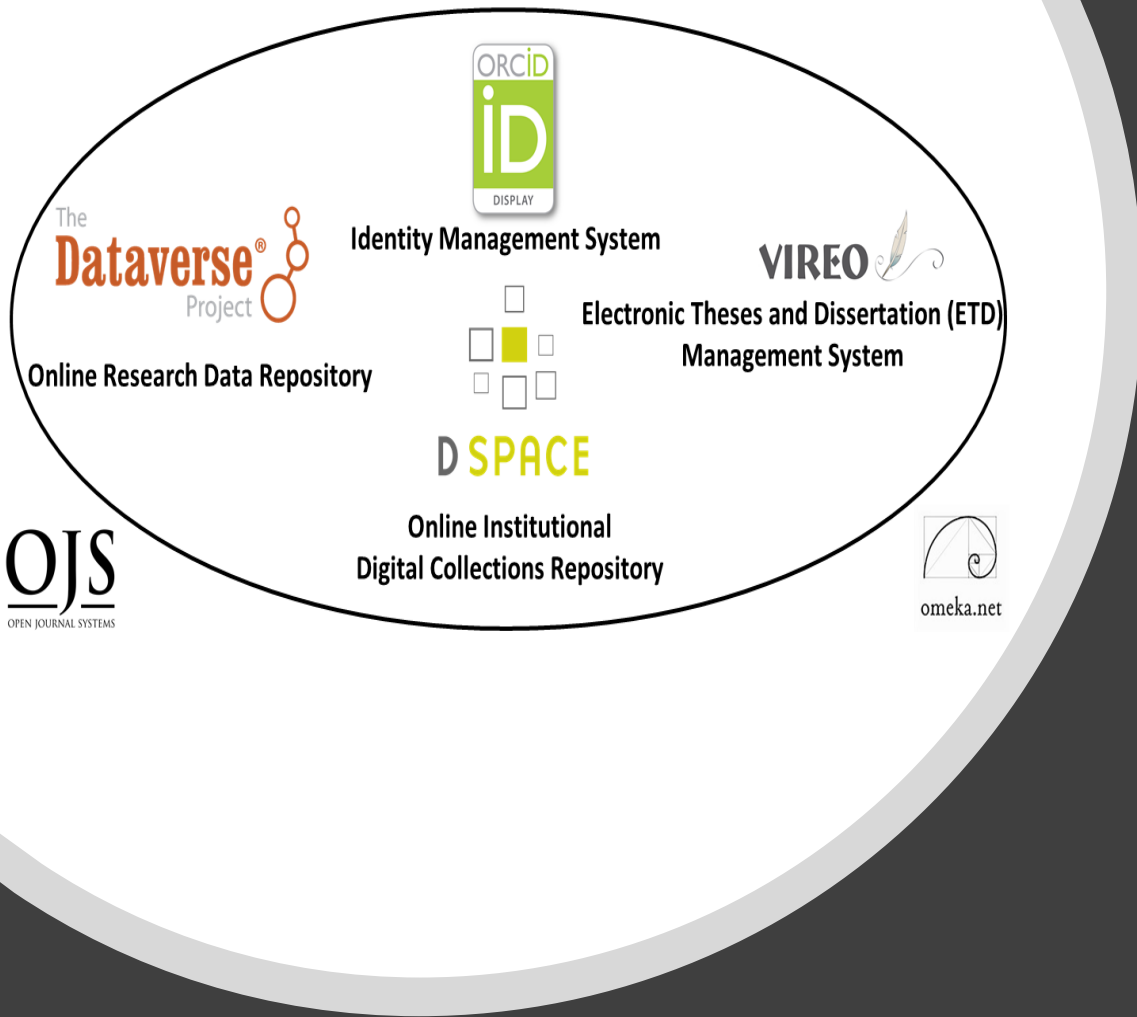
- Digital Collections Repository (Dspace)
- Research Data Repository (Dataverse)
- Identity Management System (ORCID)
- ETD Management System (VIREO)
- User Interface Software (OMEKA)
- Open Journal Software (OJS3)

Hardware: Digitization Lab

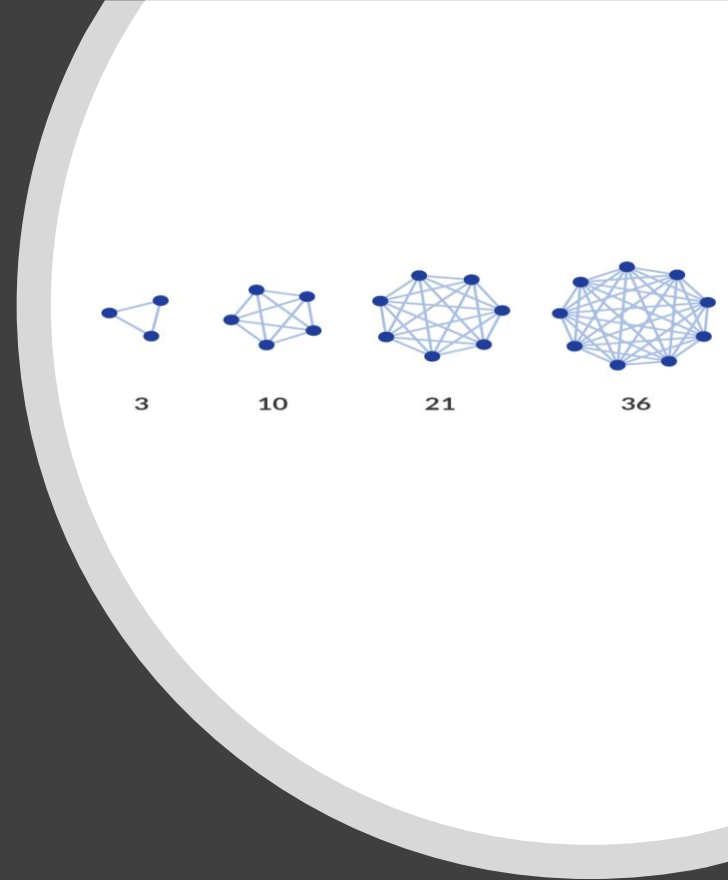
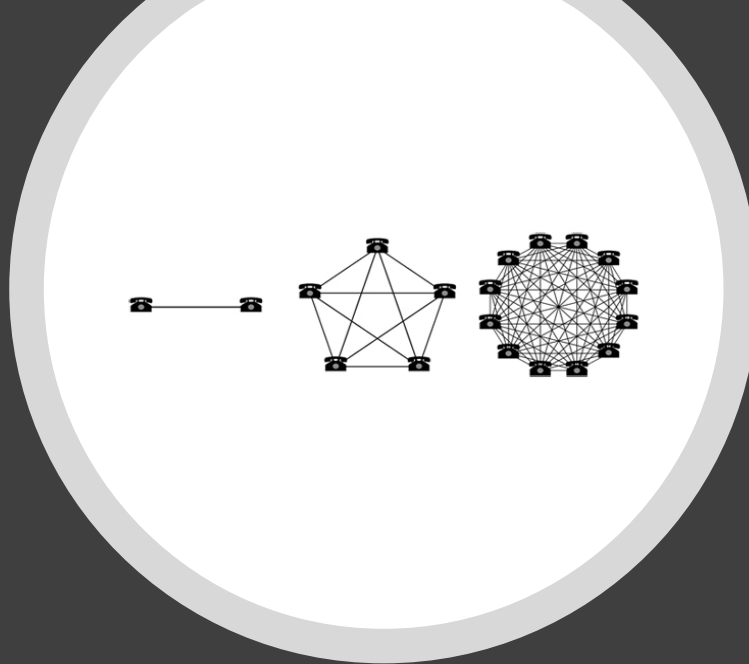
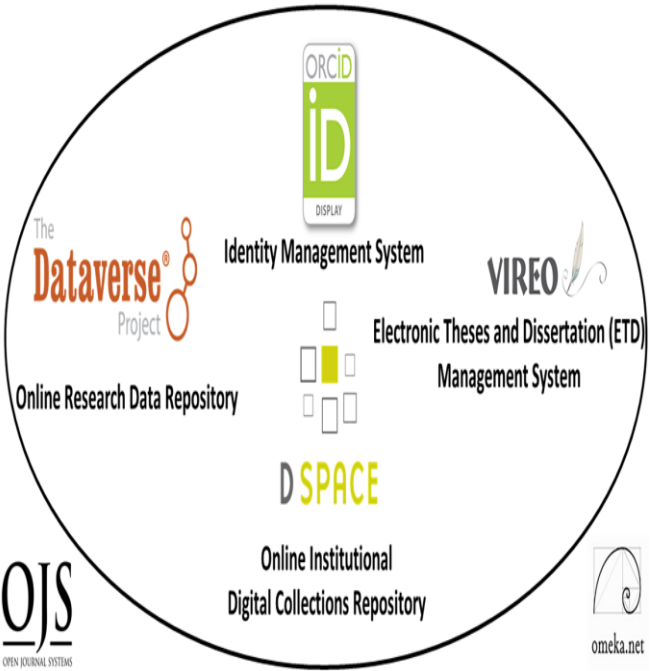
Developed and Implemented

Texas State University Libraries, 2014-2019

General Characteristics Digital Scholarly Research Ecosystem



- Open Source Software
- Customizable Components
- Active Developer Communities

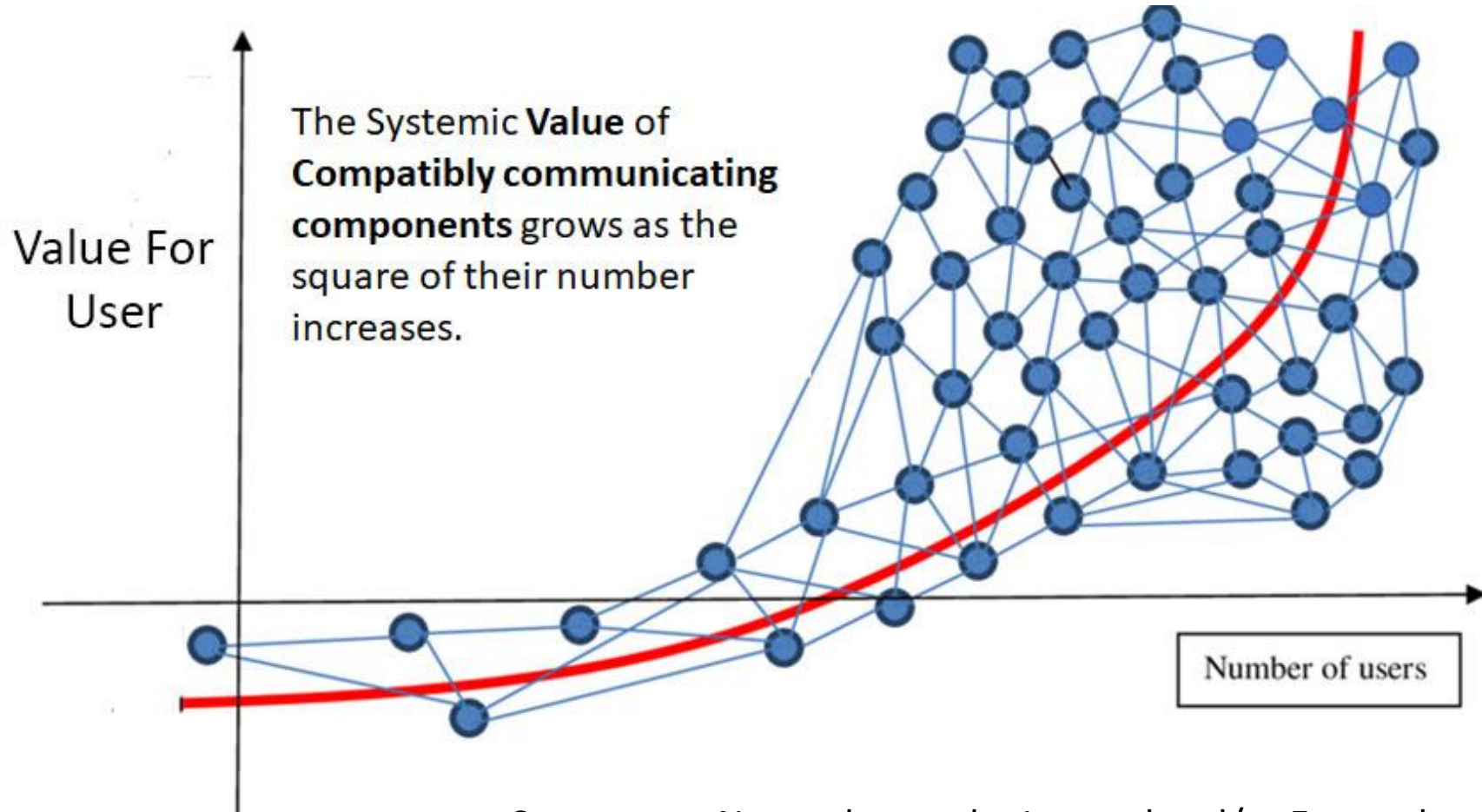


Larger Idea

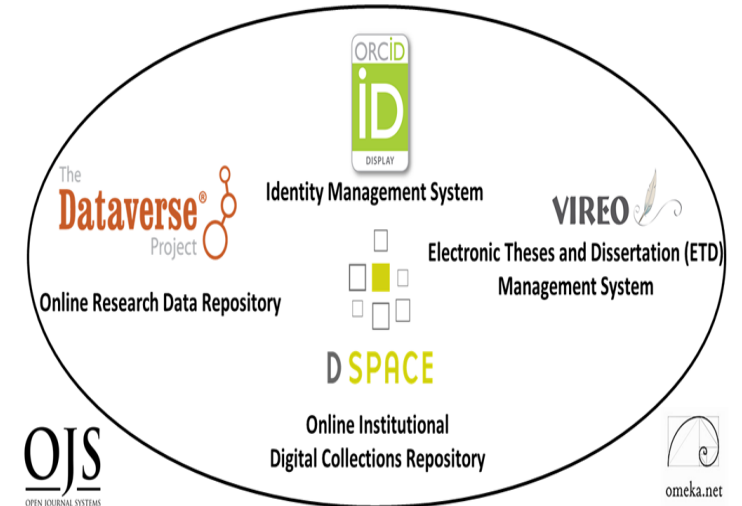
Collocating Digital Components in Networked Research Ecosystem Enables Connections and/or Larger Network Effects

Network Effects: Metcalfe's Law

Early Telecommunications Law for Ethernet (1993)



Component Networks may be Internal and/or External



Texas State University
Libraries
Digital Scholarly
Research Ecosystem
Primary Components





Institutional Digital Collections Repository (Dspace)

Organizes, centralizes and makes accessible research and knowledge generated by the institution's research community:

- Pre-prints
- Faculty Publications
- White Papers
- Conference Presentations
- Graduate Student Theses and Dissertations

Historical Legacy Application

Google search results for "athermal annealing of low-energy boron". The search bar shows the query. Below the search bar, it says "About 105,000 results (0.36 seconds)". The first result is "Scholarly articles for athermal annealing of low-energy boron". Other results include "Athermal annealing of low-energy boron implants in silicon" and "Athermal annealing of low-energy boron implants ... - Scita...".

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dc.contributor.author	Fischer, R.P.	
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Access
Findable
Search Engine Optimization

Primary Use Case Value

Application of Structured Metadata Schema for Search Engine Optimization

Enabling Accessibility and Multiple Points of Access

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Document page for "Athermal annealing of low-energy boron implants in silicon". The page includes a title, authors (Donnelly, David W., Covington, B. C., Grun, J., Fischer, R.P., Peckerar, M., Felix, C. L.), and a "Download" button circled in red. Below the button, it shows a document icon, the name "Donnelly-2001 APL...", size "322.5Kb", and format "PDF".

Efficacy of Structured Metadata Schema Application for Search Engine Optimization Accessibility and Multiple Points of Access

Digital Collections Home > Departments, Schools, Centers & Institutes > Physics, Department of > Faculty Publications-Physics > View Item

Athermal annealing of low-energy boron implants in silicon

Donnelly, David W., Southwest Texas State University, Dept. of Physics;
Covington, B. C., Southwest Texas State University;
Grun, J., Naval Research Laboratory, Washington, DC;
Fischer, R.P., Naval Research Laboratory;
Peckerar, M., Naval Research Laboratory;
Felix, C. L., United Industries Inc.

Comments:

Original publication information [Appl. Phys. Lett. 76, 2000 \(2001\)](#)

Recommended Citation:

Donnelly, David W. and Covington, B. C. and Grun, J. and Fischer, R.P. and Peckerar, M. and Felix, C. L., "Athermal annealing of low-energy boron implants in silicon" (2001). *Applied Physics Letters*. <https://digital.library.txstate.edu/handle/10877/4675>

[Show full metadata](#)

Download



Name: Donnelly- 2001 APL ...
Size: 322.5Kb
Format: PDF

[View/Open](#)

This item appears in the following Collection(s)

• Faculty Publications-Physics

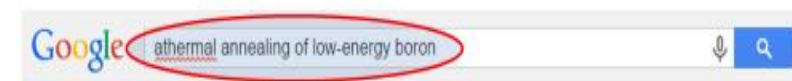
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Title	dc.title	Athermal annealing of low-energy boron implants in silicon	en_US
Language	dc.language.iso	en_US	en_US

Dublin Core
Metadata

Access Points

Findability

Search Engine
Optimization (SEO)



Web Shopping Images Videos News More Search tools

About 105,000 results (0.36 seconds)

Scholarly articles for athermal annealing of low-energy boron

Athermal annealing at room temperature and ... - Shao - Cited by 19
Athermal annealing of low-energy boron implants in ... - Donnelly - Cited by 10
Hydrogen passivation of silicon carbide by low-energy ... - Achtziger - Cited by 53

Athermal annealing of low-energy boron implants ... - Scita...

[scitation.aip.org/content/.../1.1359784?...](#) - American Institute of Physics
by DW Donnelly - 2001 - Cited by 10 - Related articles
Athermal annealing of low-energy boron implants in silicon. D. W. Donnelly) and B. C. Covington. Department of Physics, Southwest Texas State University, ...

Athermal annealing of low-energy boron implants in silicon

[digital.library.txstate.edu/.../Faculty-Publications-Physics](#)
by DW Donnelly - 2001 - Cited by 10 - Related articles
Athermal annealing of low-energy boron implants in silicon. Donnelly, David W., Southwest Texas State University, Dept. of Physics; Covington, B. C., Southwest ...

#2 of 105,000
Immediately
Available

Athermal annealing at room temperature and enhanced ...

[connection.ebscohost.com/.../athermal-annealing-room-temperature-enh...](#)
Athermal annealing of implantation damage induced by low energy boron implants at room temperature was observed after coimplantation and such annealing ...

Digital Collection Repositories Gives Insight and another window into Faculty/Student Research (Statistics)

BROWSE

- All of Digital Collections
- Communities & Collections

ACCOUNT

STATISTICS

- Most Popular Items
- Statistics by Country
- Most Popular Authors

Most Popular Items

10 results | Entire repository | All regions | All time

Item title	File downloads	Item views	Sum
Fear: A Psychophysiological Study of Horror Film Viewing	70,564	8,161	78,725
Study of Museum Lighting and Design	67,844	2,082	69,926
Female Figurines of the Upper Paleolithic	62,848	2,103	64,951
Gender Differences in Parenting Styles and Effects on the Parent-Child Relationship	61,284	3,392	64,676
A Study of the Relationship Between Absenteeism and Job Satisfaction, Certain Personal Characteristics, and Situational Factors for Employees in a Public Agency	52,937	4,005	56,942
"The Decoded Message of the Seven Seals," by David Koresh	48,721	23,917	72,638
Mobile Dating in the Digital Age: Computer-Mediated Communication and Relationship Building on Tinder	48,681	16,672	65,353
A Preliminary Analysis: Prison Models and Prison Management Models and the Texas Prison System	47,934	2,705	50,639
Bottled Water: Why Is It so Big? Causes for the Rapid Growth of Bottled Water Industries	39,859	783	40,642
Introduction to Image Processing with Python and Jupyter Notebooks	32,111	2,688	34,799

File downloads, total
6,980,613

Research Data Repository

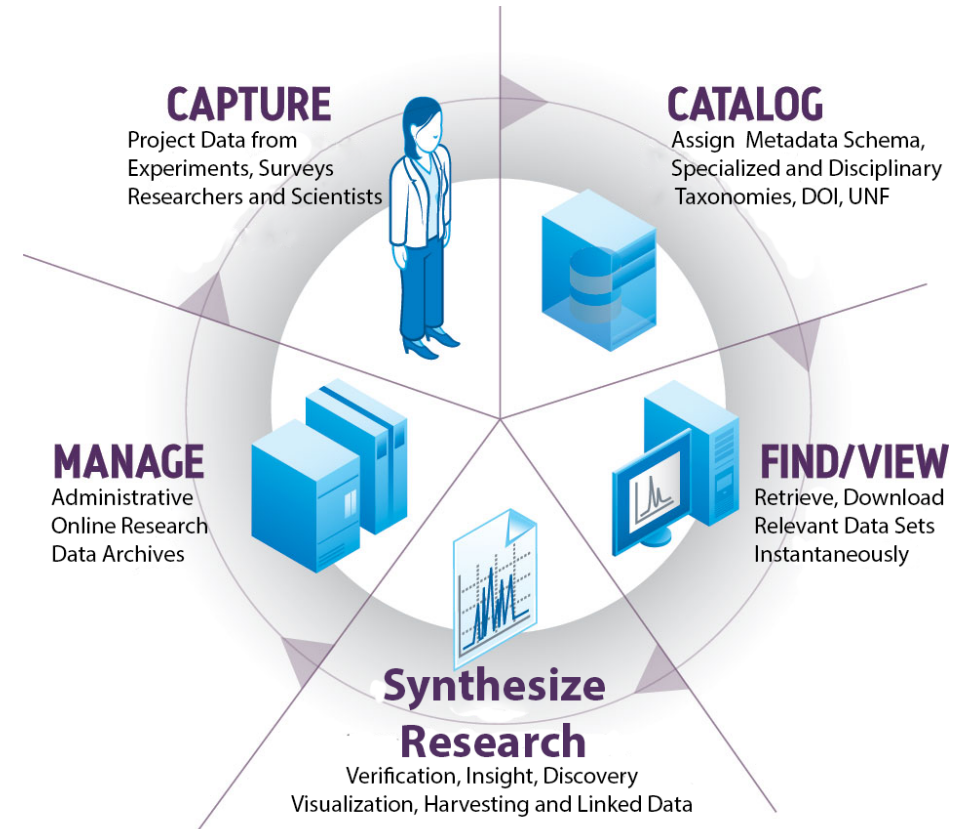
Texas State University Dataverse

A platform for publishing and archiving Texas State University's research data.

Dataverse

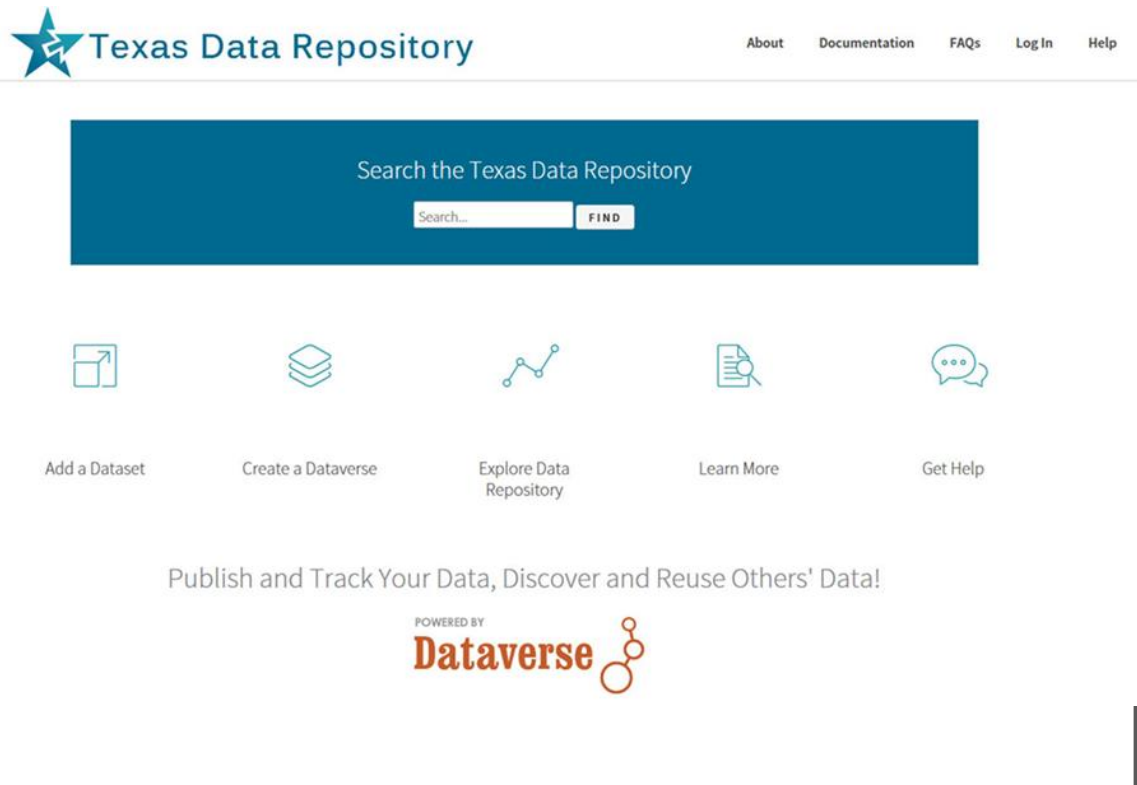


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UNIVERSITY LIBRARIES



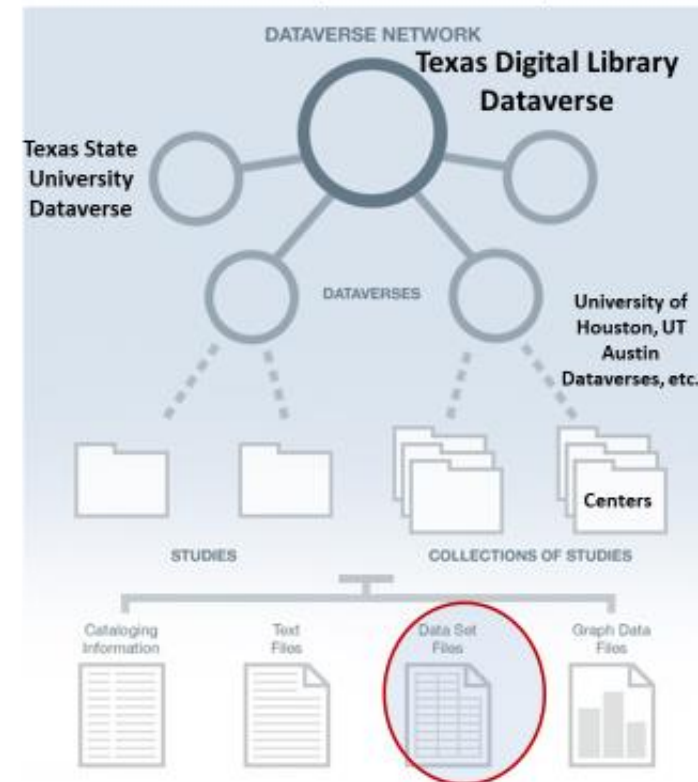
Texas State University Dataverse/TDL Dataverse

Larger Consortial Online Research Data Repository



The screenshot shows the Texas Data Repository website. At the top left is the logo with a star and the text "Texas Data Repository". To the right are navigation links: "About", "Documentation", "FAQs", "Log In", and "Help". Below the navigation is a large blue search bar with the text "Search the Texas Data Repository" and a "FIND" button. Underneath the search bar are five icons representing different actions: "Add a Dataset", "Create a Dataverse", "Explore Data Repository", "Learn More", and "Get Help". At the bottom, there is a banner that says "Publish and Track Your Data, Discover and Reuse Others' Data!" and a logo for "POWERED BY Dataverse".

Dataverse Architecture (Consortial)



Digital Scholarly Research System

Secondary Components



Vireo, Omeka and OJS

(Dependent on Primary Content Repositories)

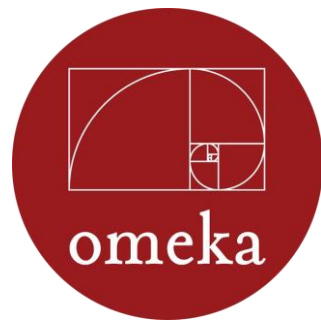


Electronic Thesis and Dissertation Management System

Addresses Intermediary steps in the ETD Process

Bridges Student Thesis/Dissertation Submission with

Graduate School Review, Online Publication and ETD Preservation



Open Source User Interface Software

allows an elegant portal or gateway entrance to digital collections data repositories, large research projects - linking text, image media and datasets



Open Access Academic Journal Software for the academic refereed journal workflow and online publishing



ORCID is a hub connecting the research landscape

Researcher Identity Management System

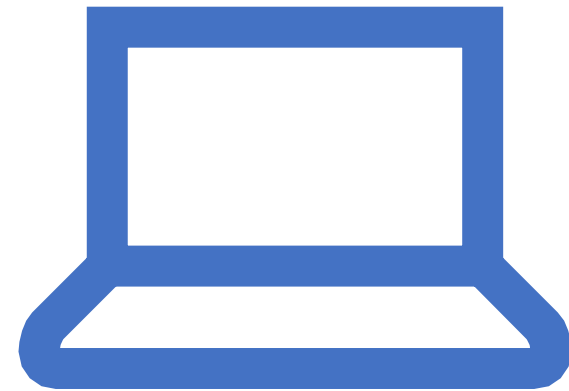
ORCID

- Allows publications from a researcher to be found, linked and aggregated across multiple information Systems
- Gives Researchers Unique Number (ORCID ID)
Connecting and Disambiguate Scholars names
Maria Hernandez, Biochemist
Maria Hernandez, M.D. or Astrophysicist
- Can also act as a Network Hub

Digital Scholarly Research System

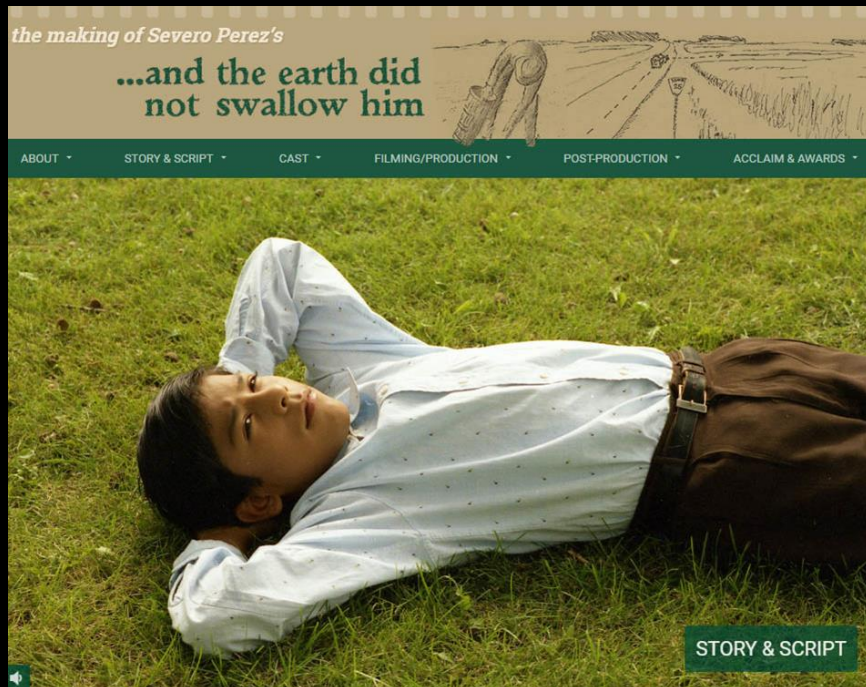
Tertiary Components

The Digitization Lab Hardware & Specialized Software



The Digitization Lab

Expands Possibilities for Faculty
Research Projects

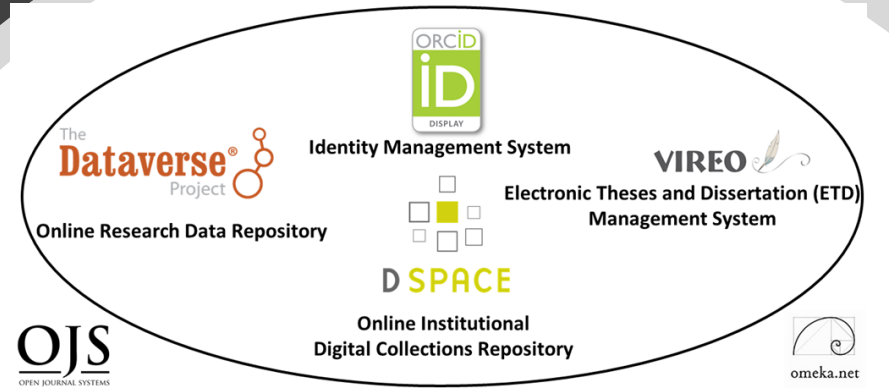


Digitization possibilities on media levels range from OCR to image, book, manuscript & journal digitization, 3D objects, posters, audiovisual material maps, GIS and visualization technologies (IIIF etc)



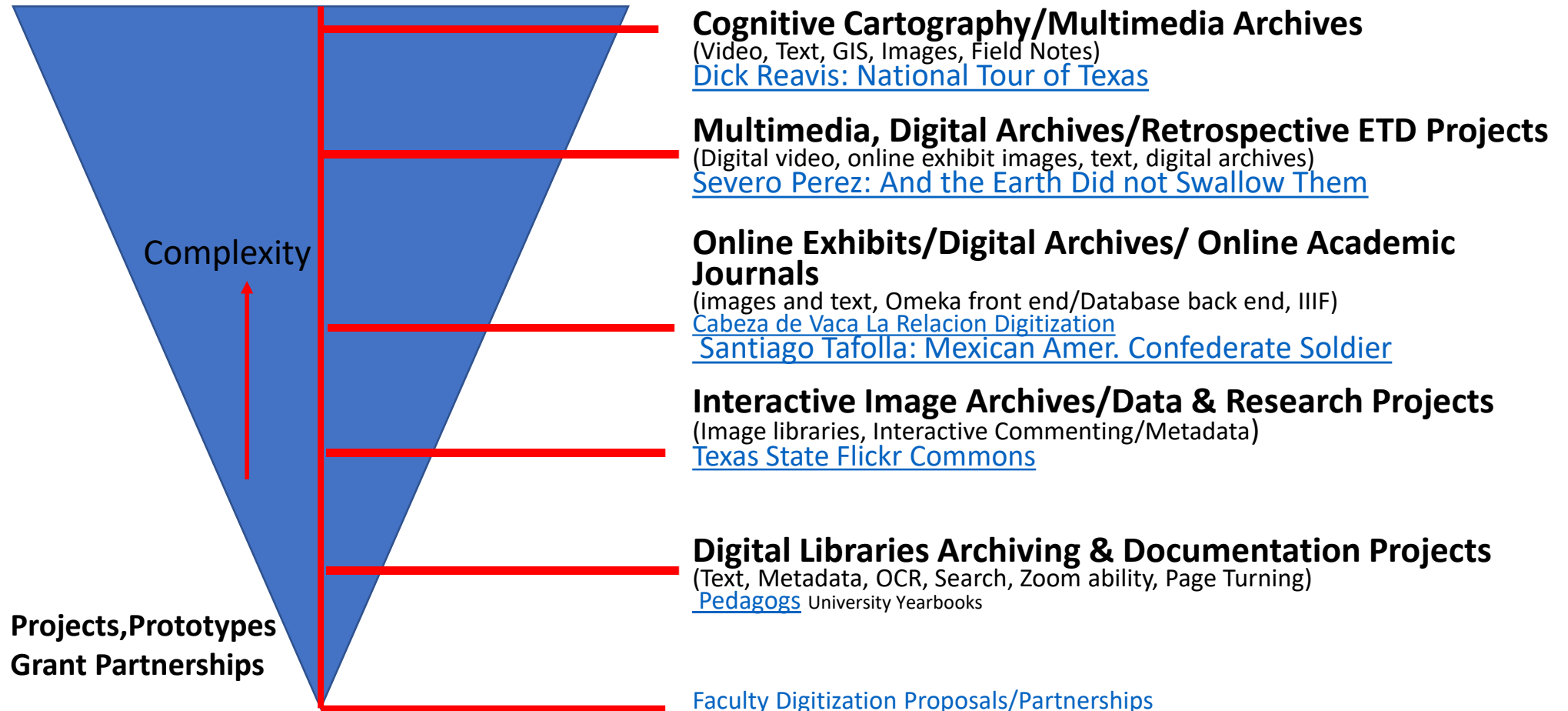
Combining Components System Synergies

Digital Scholarly Research Ecosystem



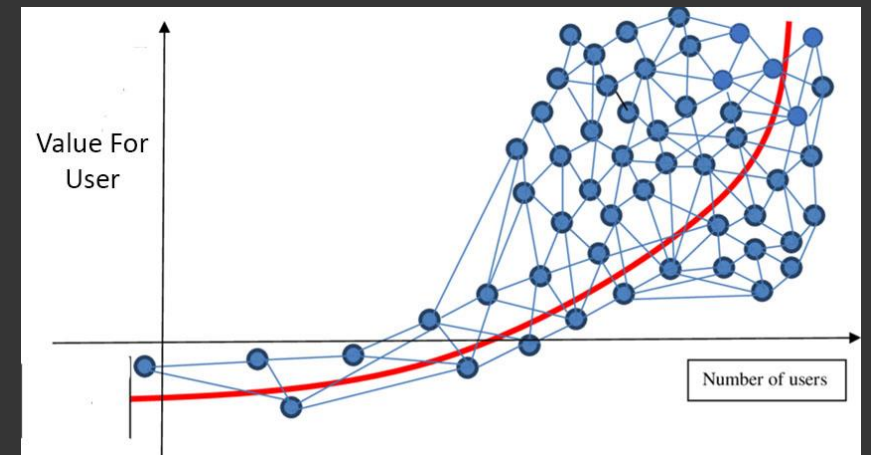
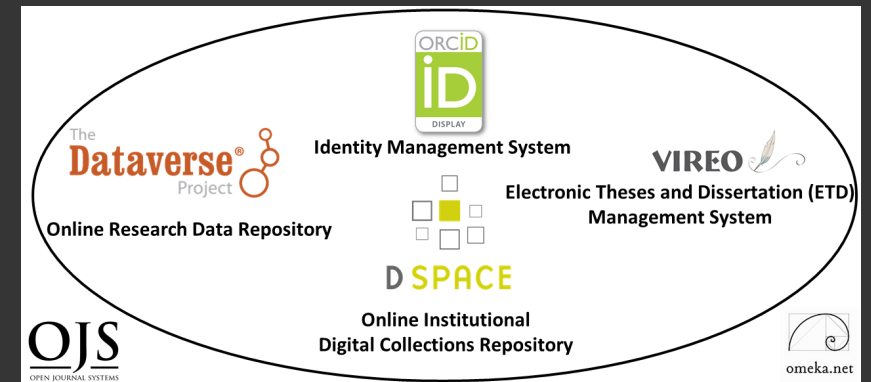
Combining These Research Ecosystem Components

Opens Possibilities For Digital Scholarship & Partnership Opportunities



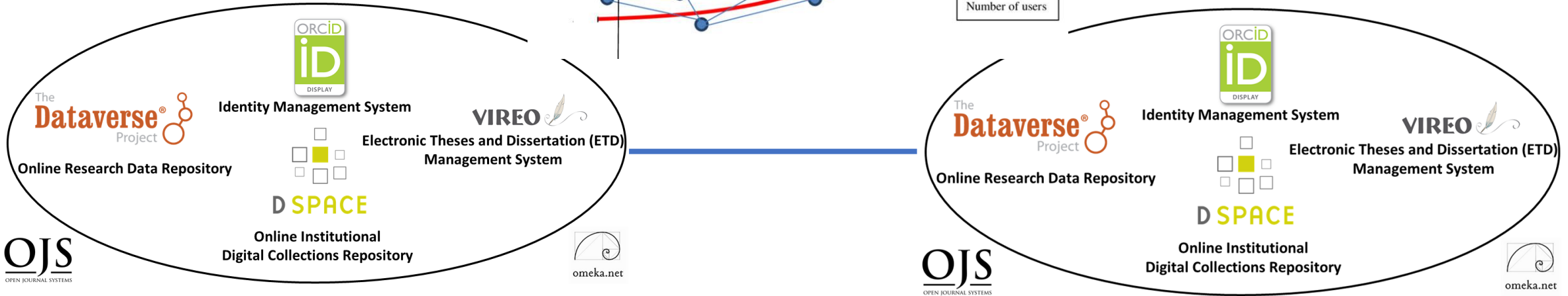
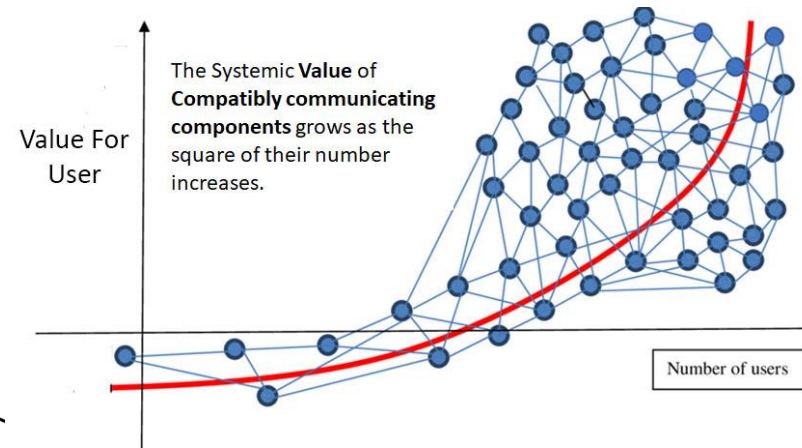
Ecosystem Open Source Software Enables Core Research

- Articles, Theses, Dissertations in the collections repository can be associated with datasets in the data repository for reference, verification or reproducibility.
- Journal article citation lists can be associated with articles and datasets in the Collections and Data Repositories
- Papers in the collections repository and datasets in data repository can be associated with ORCID ID's for aggregation of research profiles. Also, the University's Faculty Profile Systems (Digital Measures)
- Further Desired Connections can also guide developmental paths for both component software and the ecosystem



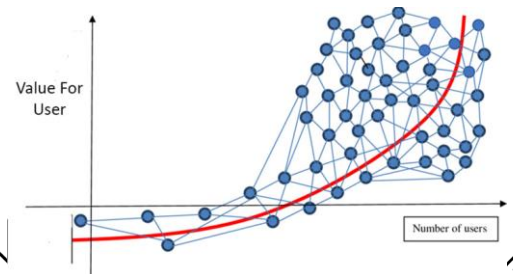
Network Effects

Both In and Between Individual Components
and In and Among Component Networks



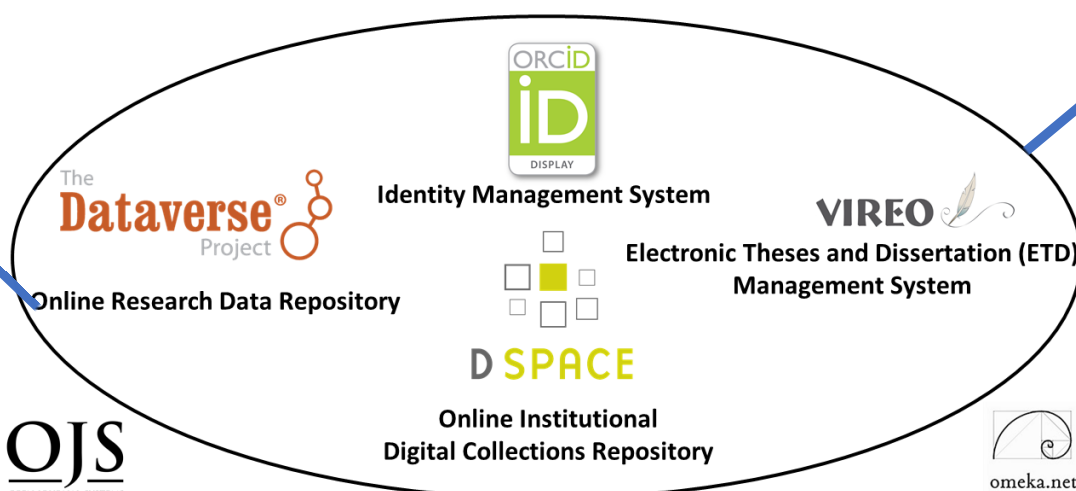
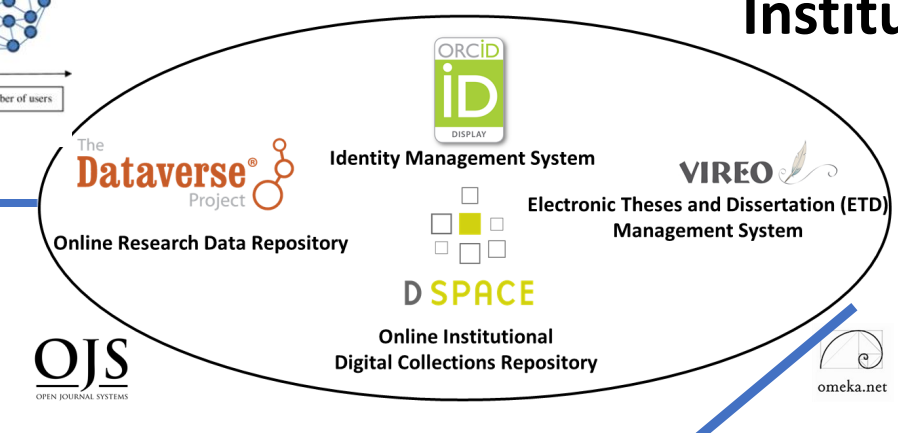
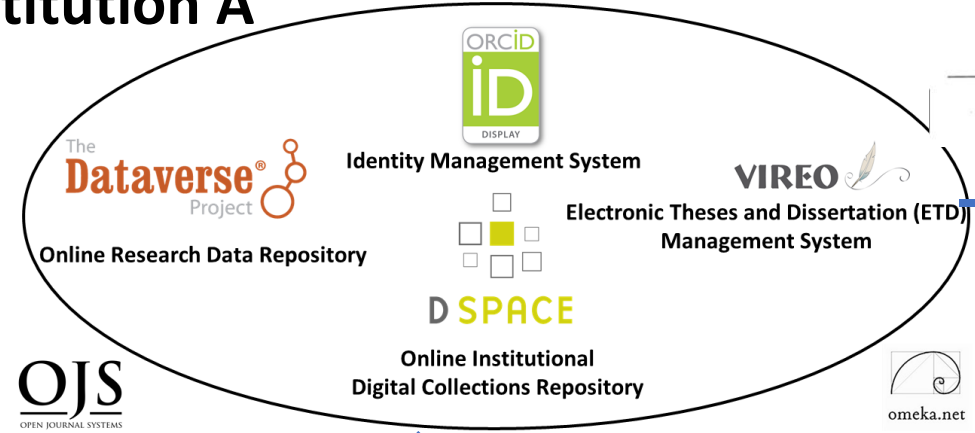
- 1) ORCID Aggregates from Several Sources and Networks and Connects to Other Networks, Internal and External
- 2) OMEKA can act as a middleware front end connecting several components and component networks internally.
- 3) Digitization Lab's IIF Framework can create internal or globally distributed Image Libraries.
- 4) Dataverse can be configured as a single Instance or as a Consortial Model (Texas 22 Individual Instances, TDL)

Network Effects and Opportunities Among Research Institutions

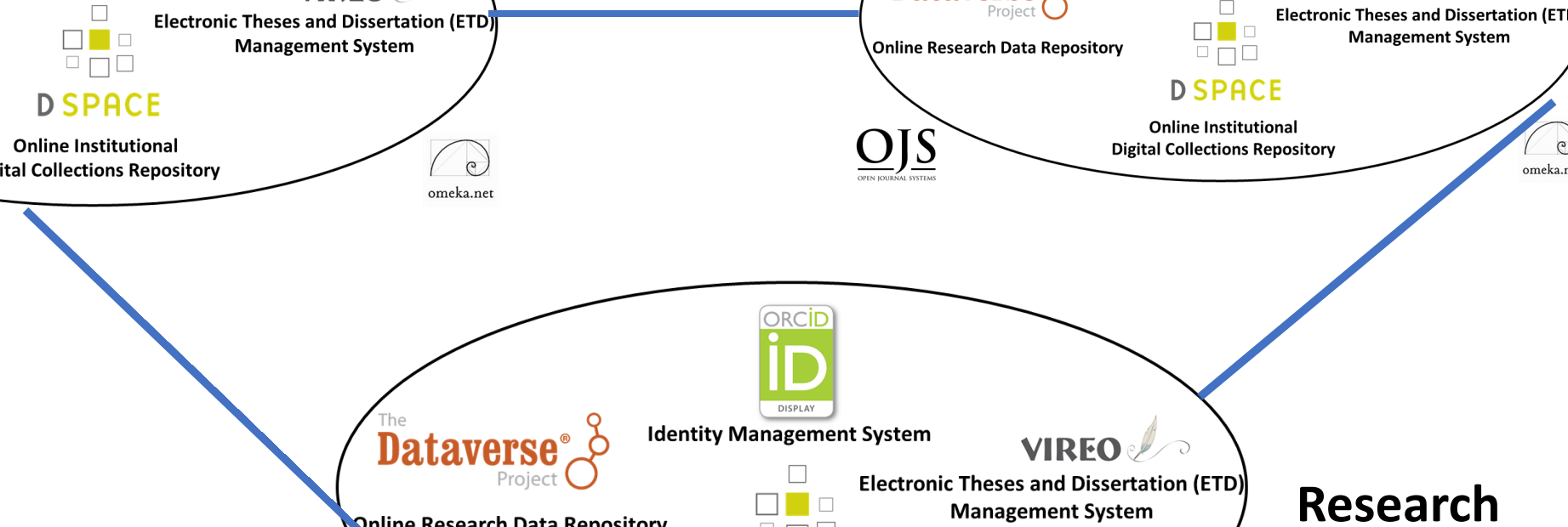


Research Institution A

Research Institution B



Research Institution C



Assessment and Results

Quantitative and Qualitative Measures

Ecosystem Implemented in Stages, 2014-2019

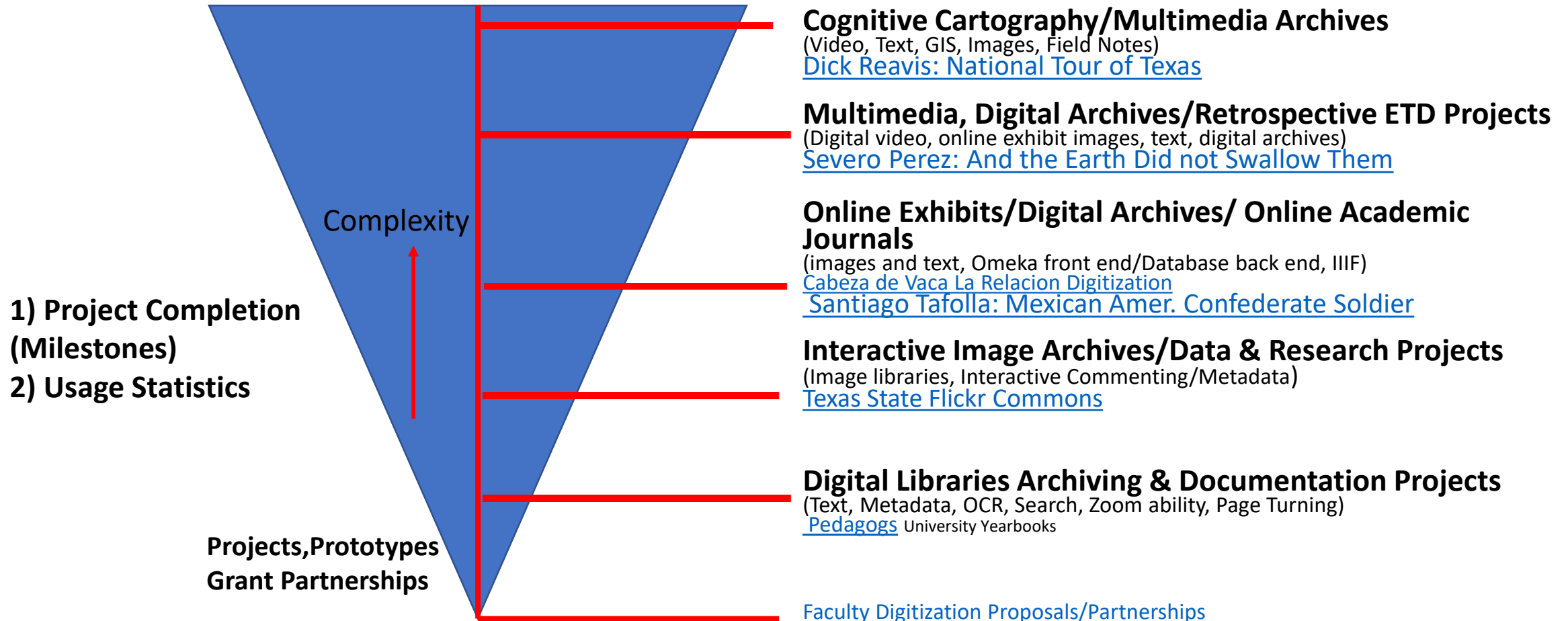
System	2014	2015	2016	2017	2018	2019
Downloads						
DSpace	326,762	318,742	385,163	341,224	972,359	1,010,349
ETDs	136,985	158,240	200,373	328,420	470,437	505,658
Dataverse	n/a	n/a	n/a	455	3,451	2,043
Number of Items						
DSpace	1,340	1,437	1,546	1,660	2,135	2,720
ETDs	967	1,174	1,326	1,581	1,789	2,218
Dataverse	n/a	n/a	n/a	28	33	53
ORCID IDs						
ORCID	101	190	316	438	545	669
Hosted Journals						
OJS	1	1	2	2	3	4

Annual Usage Growth (Downloads, Number of Items, ORCID ID's and Hosted Journals)



LibQual Biannual Survey 2013-2019, Faculty and Student System Perceptions, Comments

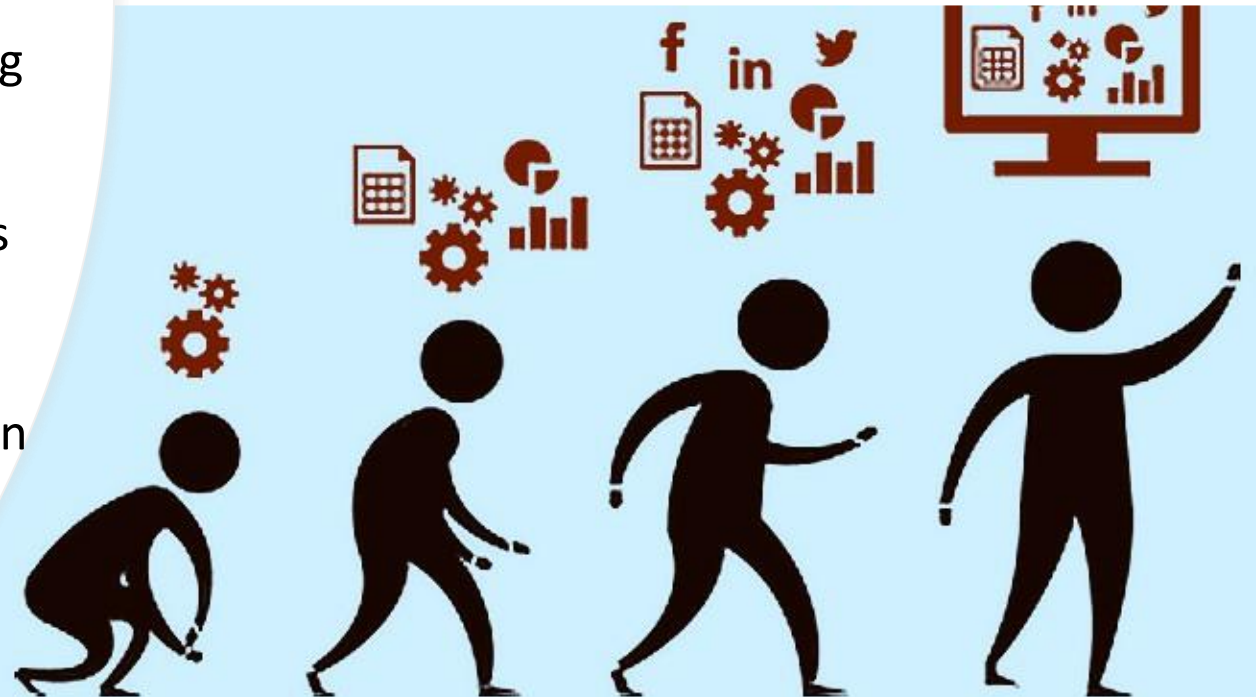
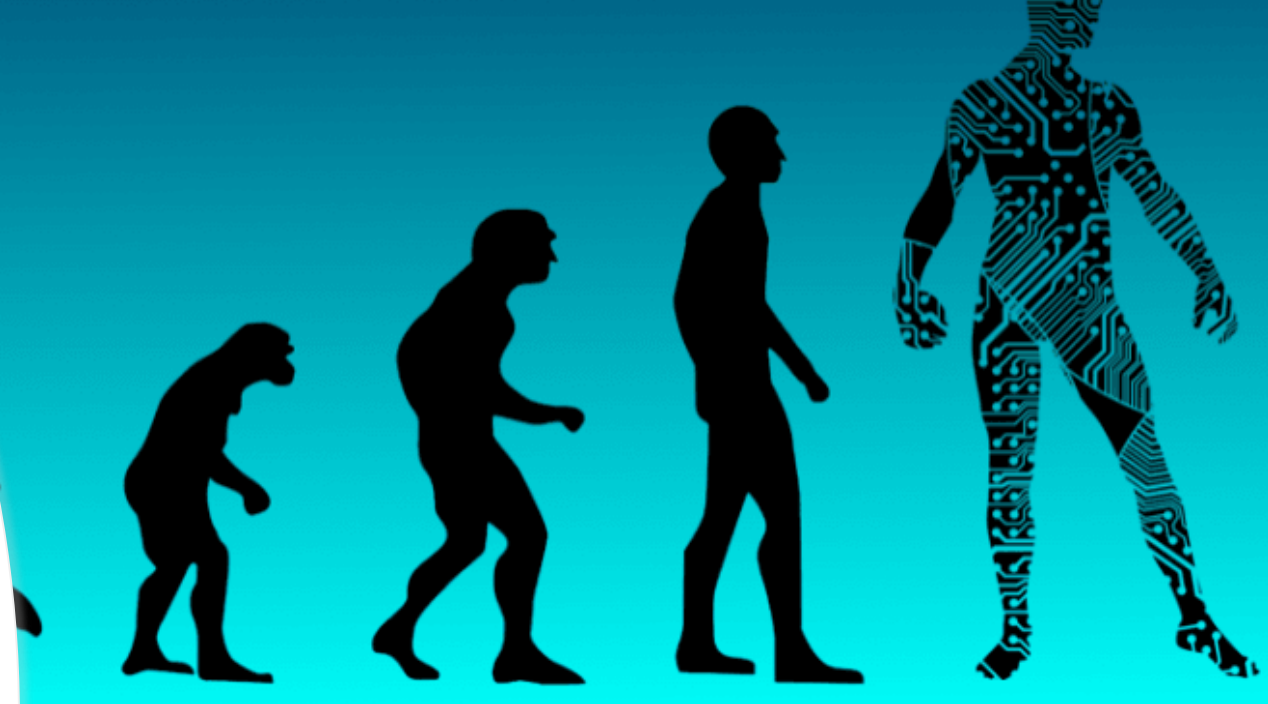
Larger Digital Scholarly Research Projects Can Act as Qualitative/Quantitative Benchmarks



Summary Reflections

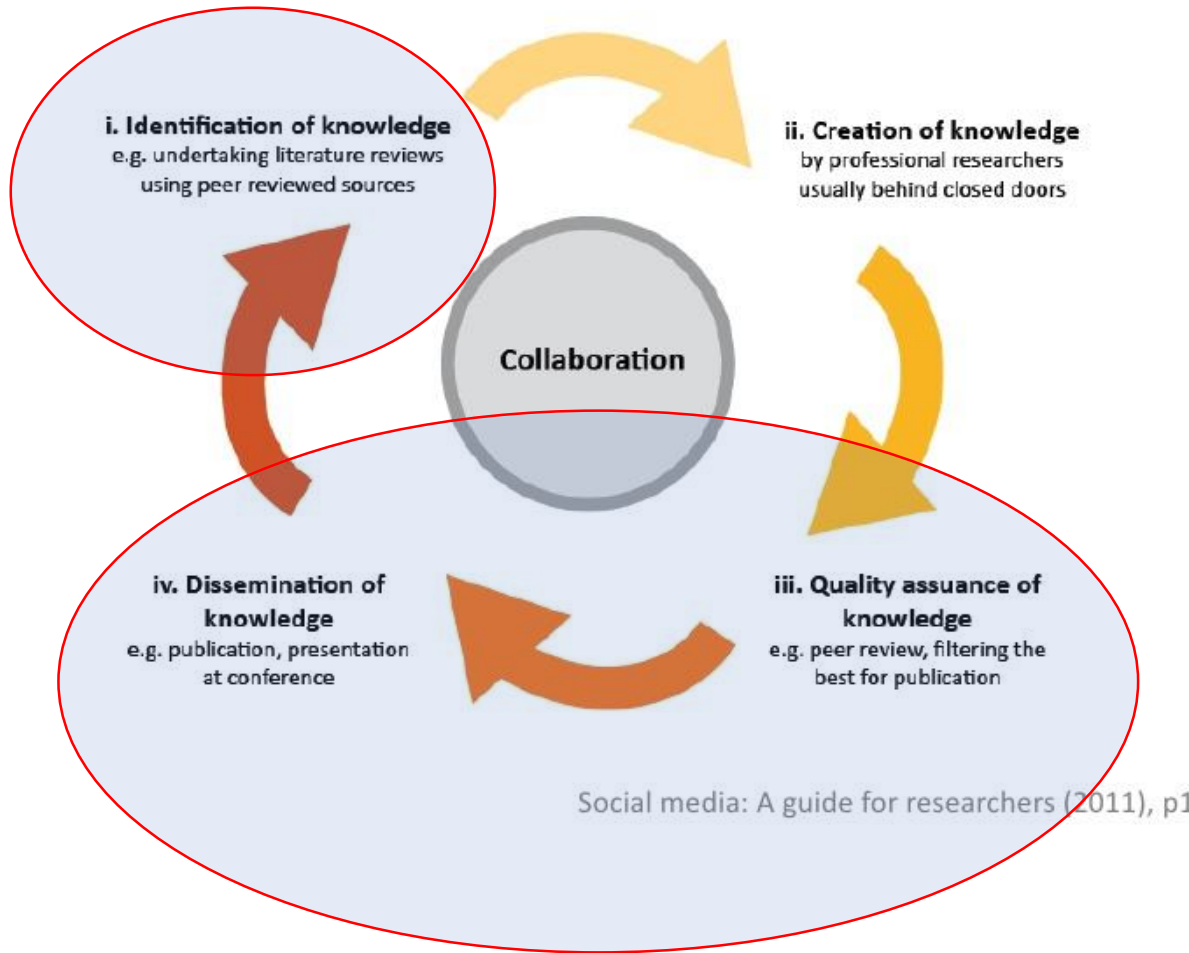
Placing Digital Scholarship Components within an Ecosystem Paradigm Usefully Enables:

- 1) Better Guidelines and Roadmaps for Developing Digital Scholarly Components
- 2) Pathways Forward and Evolutionary Possibilities for System Development
- 3) New Possibilities For Researchers working within the academic research cycle

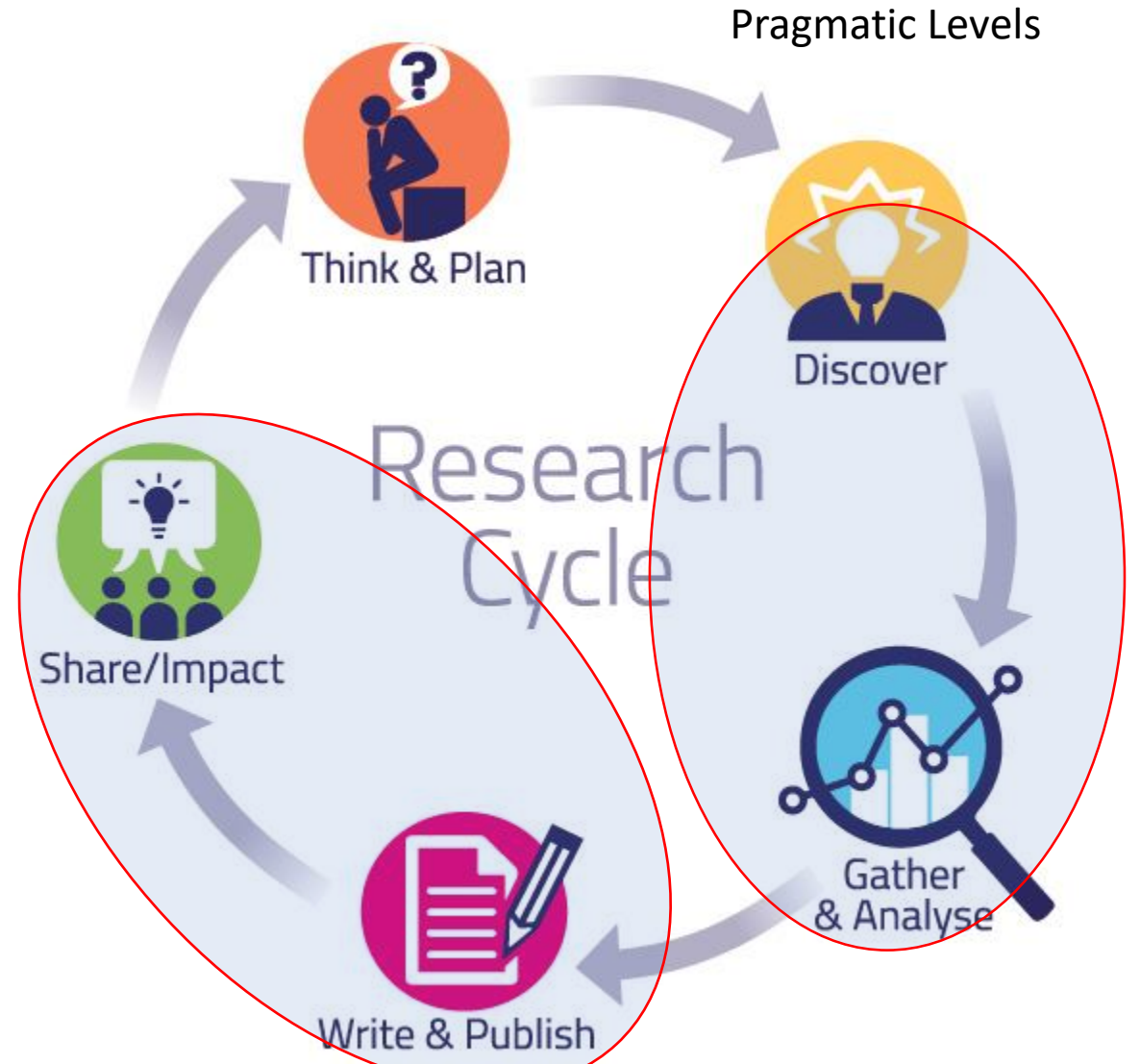


Ecosystem Components Enable Various Parts of the Academic Research Cycle

The academic research cycle



Abstract Levels



Digital Scholarly Ecosystem

Timelines and Implementation Paths

Many Roads To Rome

Year 1 Digital Collection Repository and Digitization Lab

Year 2 User Interface Software (OMEKA), Identity Management System, ORCID

Year 3 Data Repository

Year 4 ETD Middleware (VIREO) and OJS Software

Year 5 Complex Digitization Projects, IIF Server, Faculty Grant Projects etc.



Human Resources

- **System Administrator/Programmer** (server infrastructure set-up/maintenance/basic customization)
- **Digital Collections Librarian:** Administration, Marketing, User Support, Collections and Data Repository, OJS/ORCID
- **Metadata Librarian:** Dublin Core, Specialized Schema
- **Web Developer/Programmer:** OMEKA, System Integration
- **Project Manager/Department Head** (PMP Certification)
- **Digitization Specialist**
- **GIS Specialist/Data Visualization Specialist**
- **AI Specialist/Post-Doc/CLIR Fellow**

**HUMAN
RESOURCES**



Further References

Uzwyszyn, R. 2020 **Developing an Open Source Digital Scholarship Ecosystem (Preprint)**. ICEIT2020. Oxford, UK.

https://www.researchgate.net/publication/336923249_Developing_an_Open_Source_Digital_Scholarship_Ecosystem

Texas State University Libraries Website.

<https://www.library.txstate.edu/>

Texas State Digital Collections Repository

<https://digital.library.txstate.edu/>

Texas State Data Research Repository

<https://dataverse.tdl.org/dataverse/txstate>

Texas State Online Research Identity Management System:

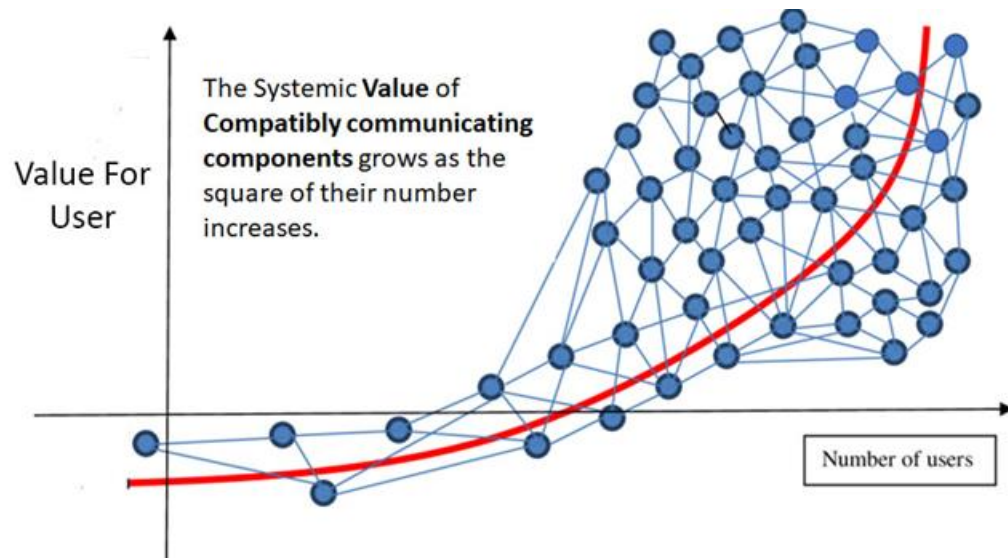
<https://guides.library.txstate.edu/researcherprofile/orcidTexas>

State Electronic Thesis and Dissertation Management (VIREO):

<https://www.tdl.org/etds/>

Texas State Digital & Web Services:

<https://www.library.txstate.edu/services/faculty-staff/digital-web-services.html>



Questions, Comments

Ray Uzwyshyn, Ph.D. MLIS

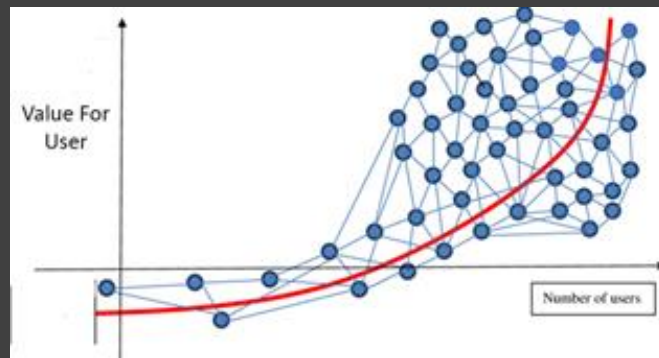
Director, Collections and Digital Services

Texas State University Libraries

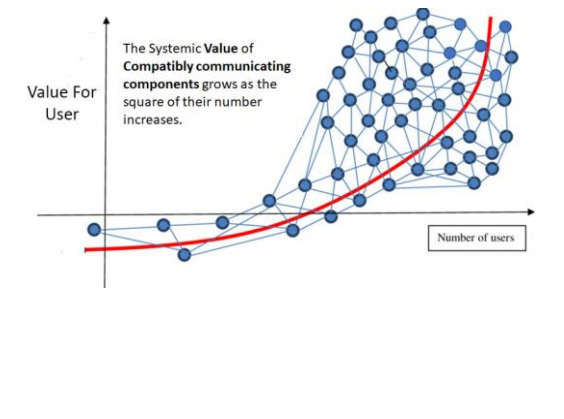
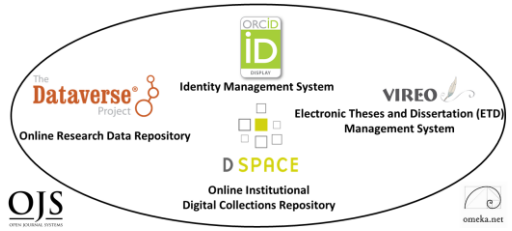
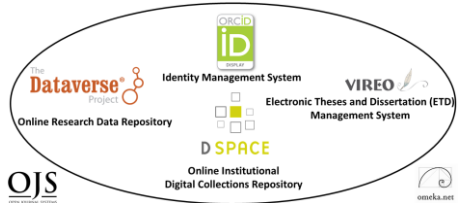
ruzwyshyn@txstate.edu, 512-245-5687

<http://rayuzwyshyn.net>

Envisioning Future Possibilities Networked Global Scholarly Research Environment



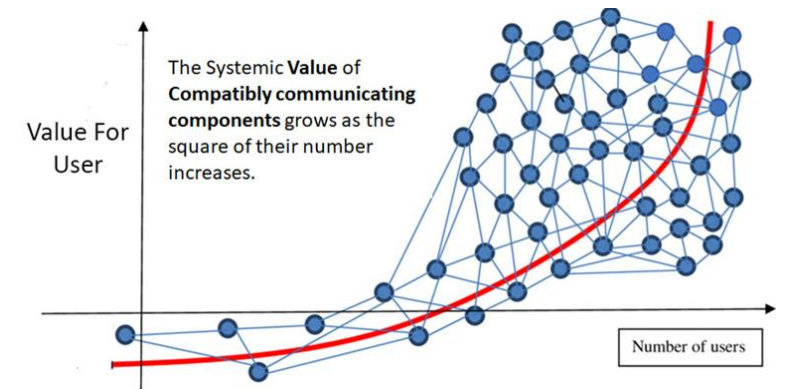
Can we Enable Scholarly Research Network Ecosystem Possibilities on Global Levels?

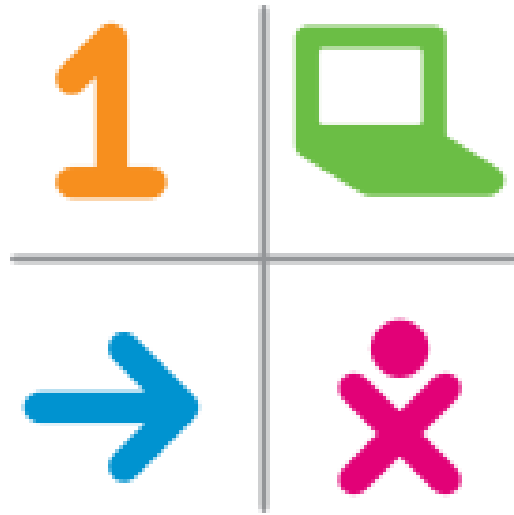


Is it Desirable or Time to Begin Thinking About Empowering a Global Research University Community ?

Research Universities and Digital Research Ecosystems

- **~266-300** Research Institutions US & Canada, Carnegie R1 & R2, Very High or High Research Activity, 124 ARL Libraries
- **~1000-1250** Research Universities Worldwide
QS Rankings and Times Higher Education Supplement. (40% Europe, 26.5% Asia Pacific, US/Canada 18%, Latin America 9% and Middle East/Africa.
- **26,000-40,000** Universities Globally. Research Universities 2.7% - 4.2% of all universities worldwide. Highest by Country: **US 156**, UK 76, Germany 45, Japan 44.
- Other Top 2-3% Research Institution Academic Libraries Globally, 1000 Institutions beyond the US and Canada. This represents the other 90% of Research Libraries Globally





one laptop per child



Brainstorming & Antecedent Models

One Laptop Per Child

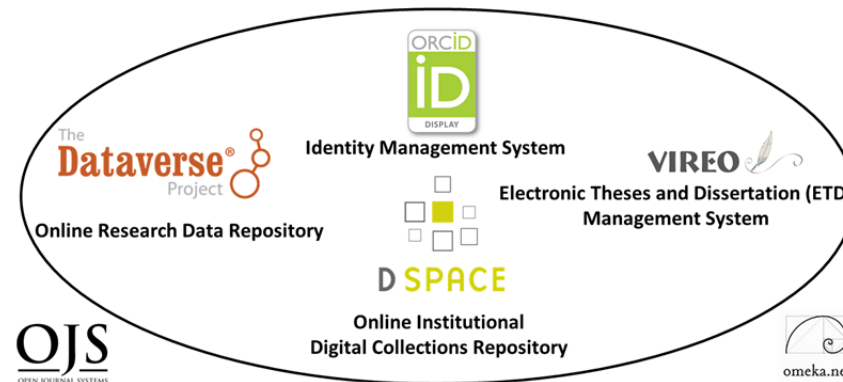
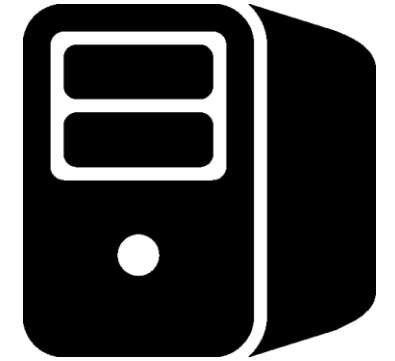
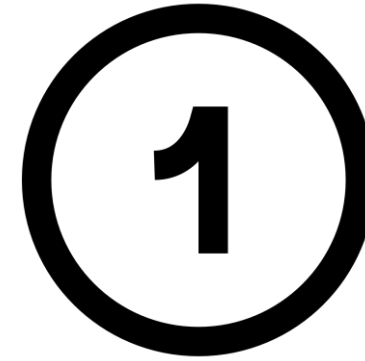
Dreamed up mid-late 90's, Launched 2005

- Nicholas Negroponte, MIT Media Lab Founding Director
- Noble Initiative/Grand Ambitions
- Vision: Give each child in world access to a laptop with open source software for less than 100.00 \$US/laptop
- Gage Effects For Education Globally
- Can We do the same thing for academic research globally?

One Server Per Research Institution 2020-2025

Simple Idea

- Empower 1000 Research University Institutions/Research Libraries Globally
- Give them One Configured Server Ecosystem with 6 Open Source Scholarly Research Software Components, < \$1000.00 US/Server or set up Fractional Server Space Globally (SAAS)
- Set Up Brief Training
- **Measure the Effects**



Research Universities and Digital Research Ecosystems

- **124** ARL Research Libraries (US and Canada)
- **131** US Research Universities (Carnegie R1, Very High Research Activity)
- **135** Doctoral Universities (Carnegie R2, High Research Activity, US), ~266-300 Research Institutions US & Canada
- **1011** Research Universities Worldwide (40% Europe, 26.5% Asia Pacific, US/Canada 18%, Latin America 9% and Middle East/Africa.
QS Rankings
- **1250** Research Universities Worldwide, **Times Higher Education Supplement** (2.7% - 4.2% of all universities worldwide)
- By Country: **US 156**, UK 76, Germany 45, Japan 44
- Global Estimates of General University #'s **26,000-40,000**

Empower Other Top 2-3% Research Institution Libraries Globally, 1000 Institutions, the other 90% of Research Libraries Globally

