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

Number

ORCID
iD
DISPLAY

Identity Management Syste
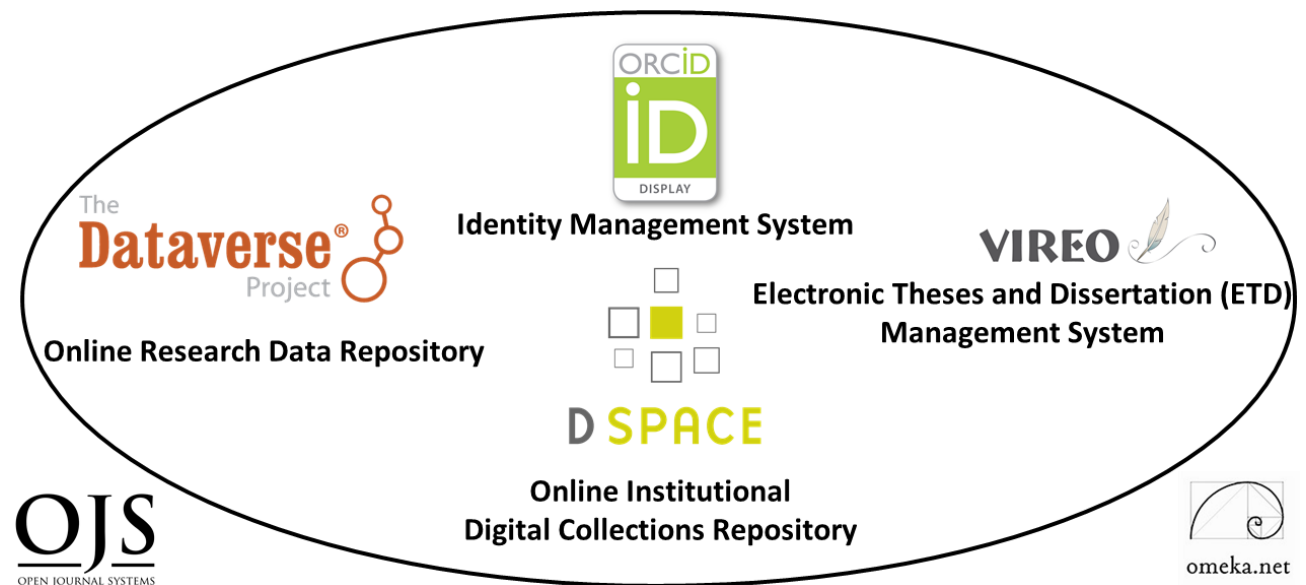
Repository

Elect

D SPACE

**Online Institutional
Digital Collections Reposito**

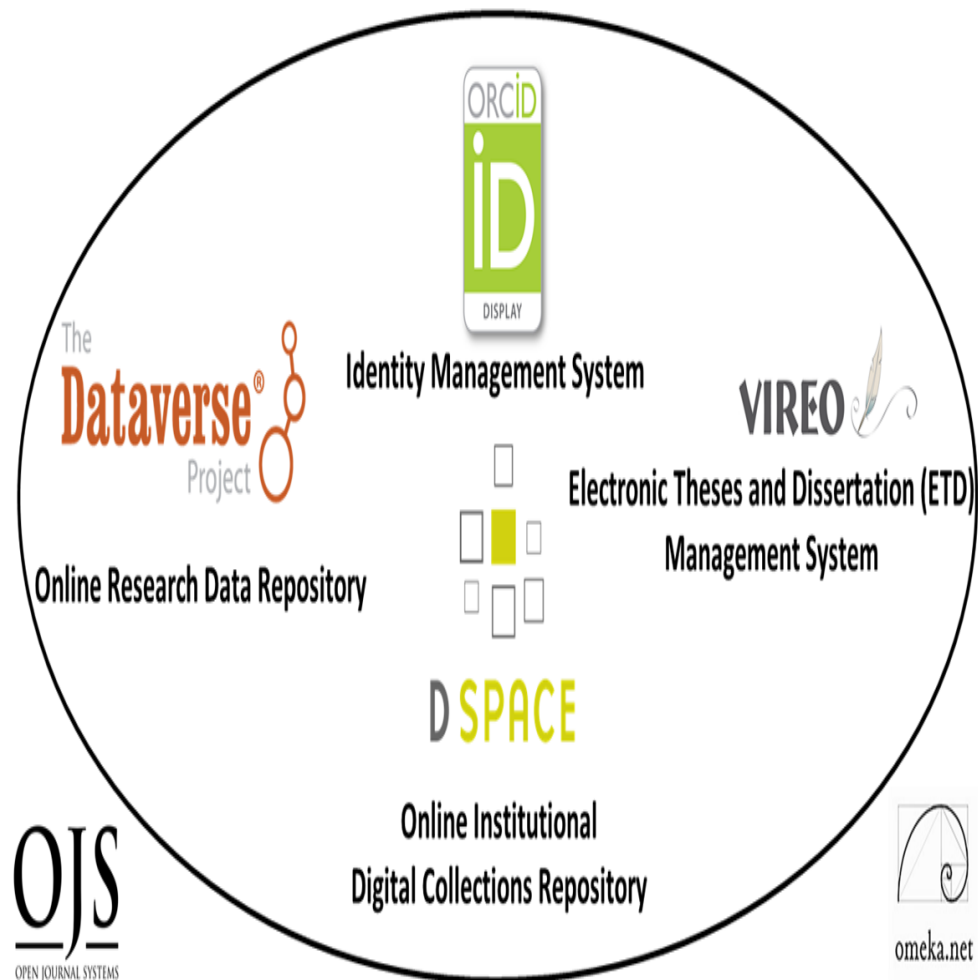# What is a Digital Scholarly Research Ecosystem?

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
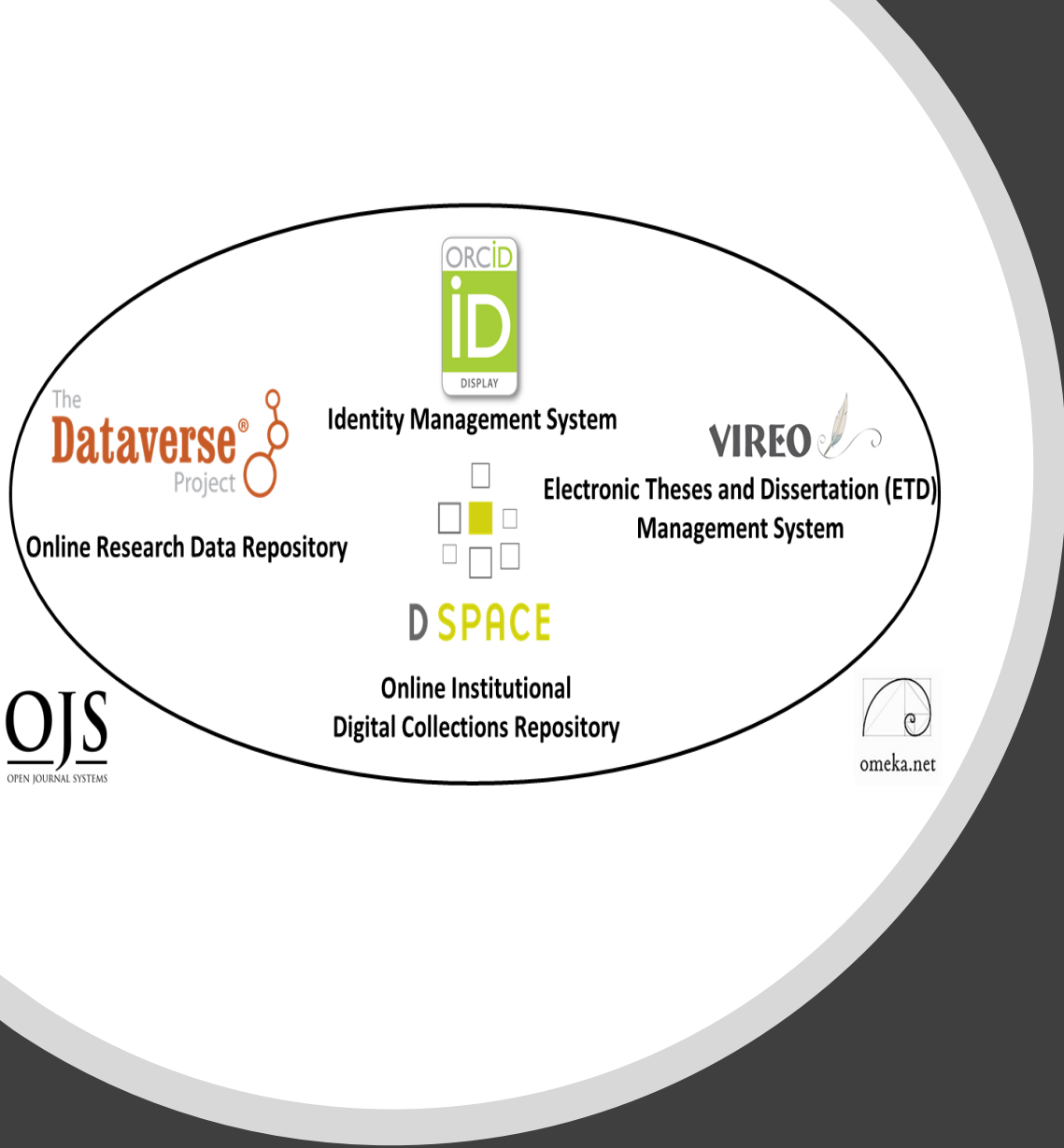
Six Main Software Components

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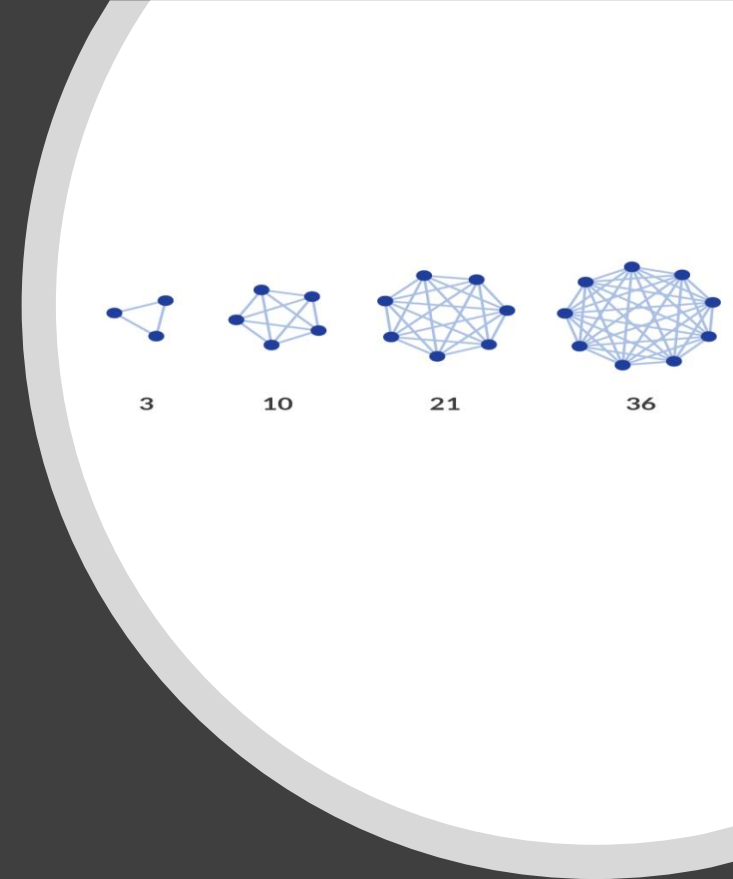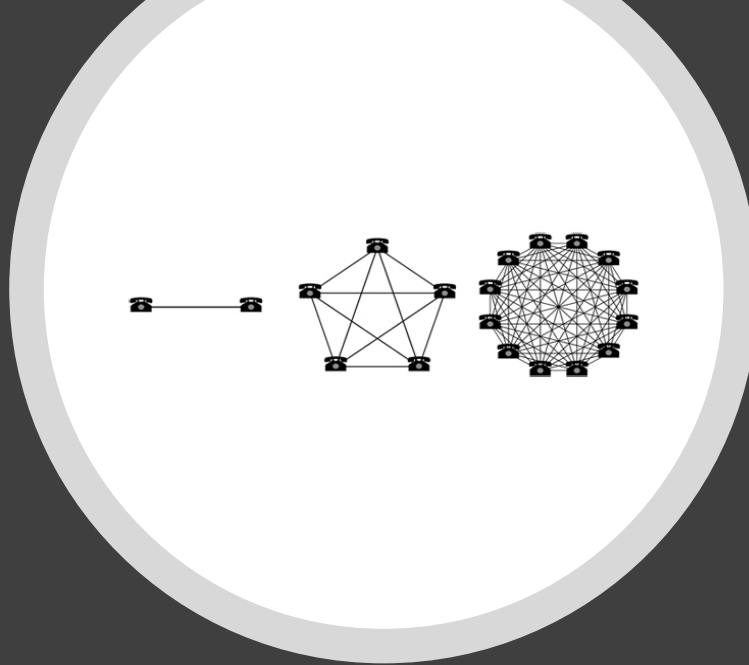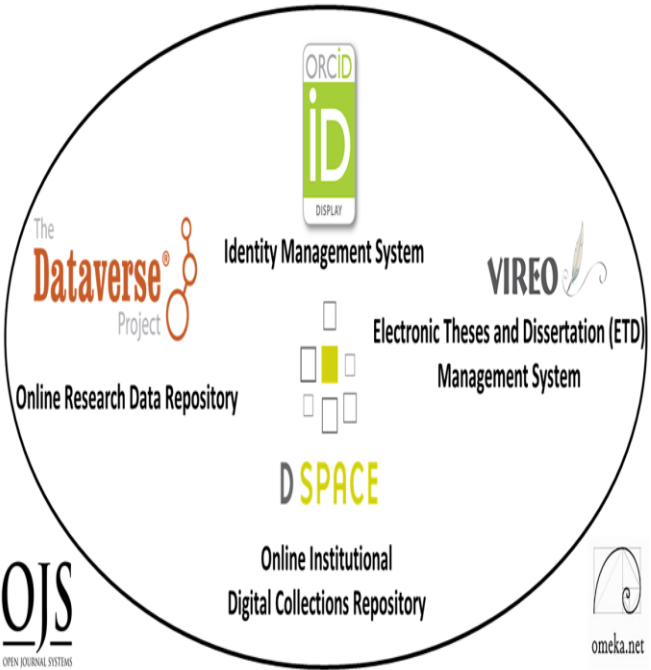- Open Journal Software (OJS3)

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)

The Systemic **Value** of **Compatibly communicating components** grows as the square of their number increases.

Value For User

Number of users
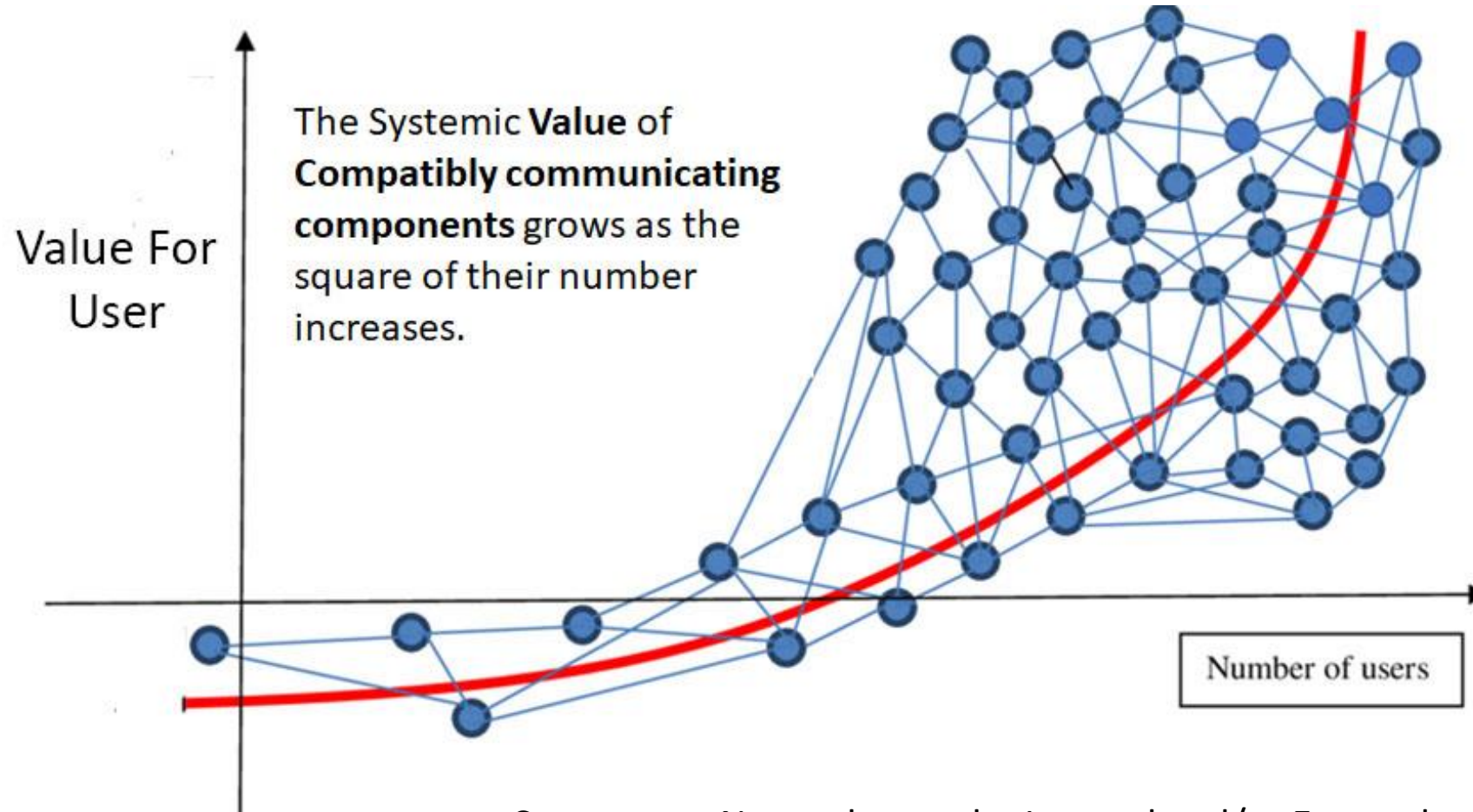
Component Networks may be Internal and/or External
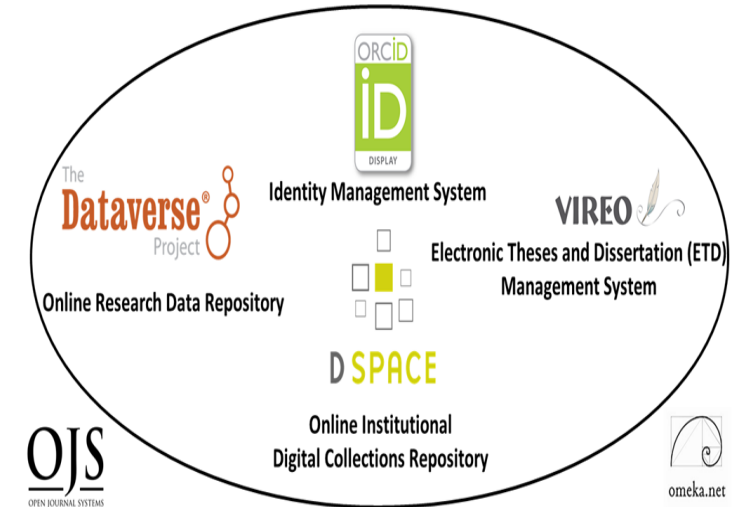
Texas State University Libraries
Digital Scholarly Research Ecosystem
Primary Components

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

Primary Use Case Value

Application of Structured Metadata Schema for Search Engine Optimization

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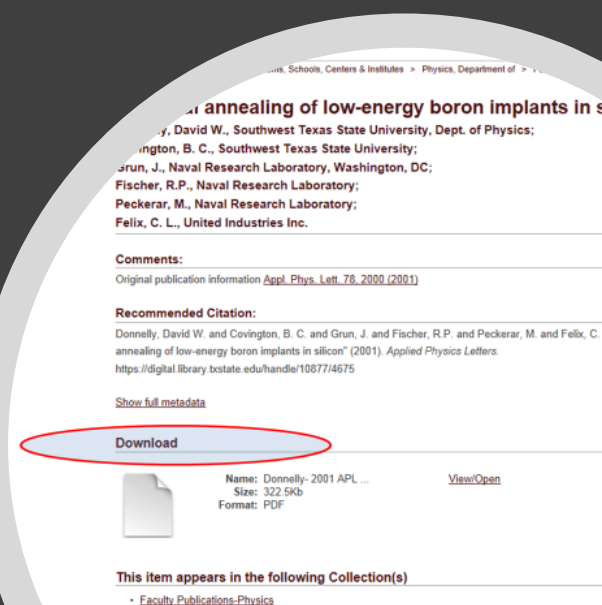
Efficacy of Structured Metadata Schema Application for Search Engine Optimization
Accessibility and Multiple Points of Access

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. 78, 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

Contributor	dc.contributor.author	Donnelly, David W.	
Contributor	dc.contributor.author	Covington, B. C.	
Contributor	dc.contributor.author	Grun, J.	
Contributor	dc.contributor.author	Fischer, R.P.	
Contributor	dc.contributor.author	Peckerar, M.	
Contributor	dc.contributor.author	Felix, C. L.	
Contributor	txstate.contributor.author	Donnelly, David W., Southwest Texas State University, Dept. of Physics	
Contributor	txstate.contributor.author	Covington, B. C., Southwest Texas State University	
Contributor	txstate.contributor.author	Grun, J., Naval Research Laboratory, Washington, DC	
Contributor	txstate.contributor.author	Fischer, R.P., Naval Research Laboratory	
Contributor	txstate.contributor.author	Peckerar, M., Naval Research Laboratory	
Contributor	txstate.contributor.author	Felix, C. L., United Industries Inc.	
Date	dc.date.available	2013-07-19T16:20:49Z	
Date	dc.date.issued	2001-04-02	
Uri	dc.identifier.uri	https://digital.library.txstate.edu/handle/10877/4675	
Subject	dc.subject	"Athermal annealing", "baron implants", silicon	en_US
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)

Google — athermal annealing of low-energy boron

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/.../1.13597847... ▾ American Institute of Physics ▾
by DW Donnelly - 2001 - Cited by 10 - Related articles
Athermal annealing of low-energy boron implants in silicon. D. W. Donnellya) 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 ...

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 ...

#2 of 105,000 Immediately Available

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

Search 🔍

BROWSE

All of Digital Collections

Communities & Collections

ACCOUNT

Login

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

TEXAS STATE
UNIVERSITY LIBRARIES

CAPTURE
Project Data from Experiments, Surveys Researchers and Scientists

CATALOG
Assign Metadata Schema, Specialized and Disciplinary Taxonomies, DOI, UNF

MANAGE
Administrative Online Research Data Archives

FIND/VIEW
Retrieve, Download Relevant Data Sets Instantaneously

Synthesize Research
Verification, Insight, Discovery Visualization, Harvesting and Linked Data

Texas State University Dataverse/TDL Dataverse
Larger Consortial Online Research Data Repository
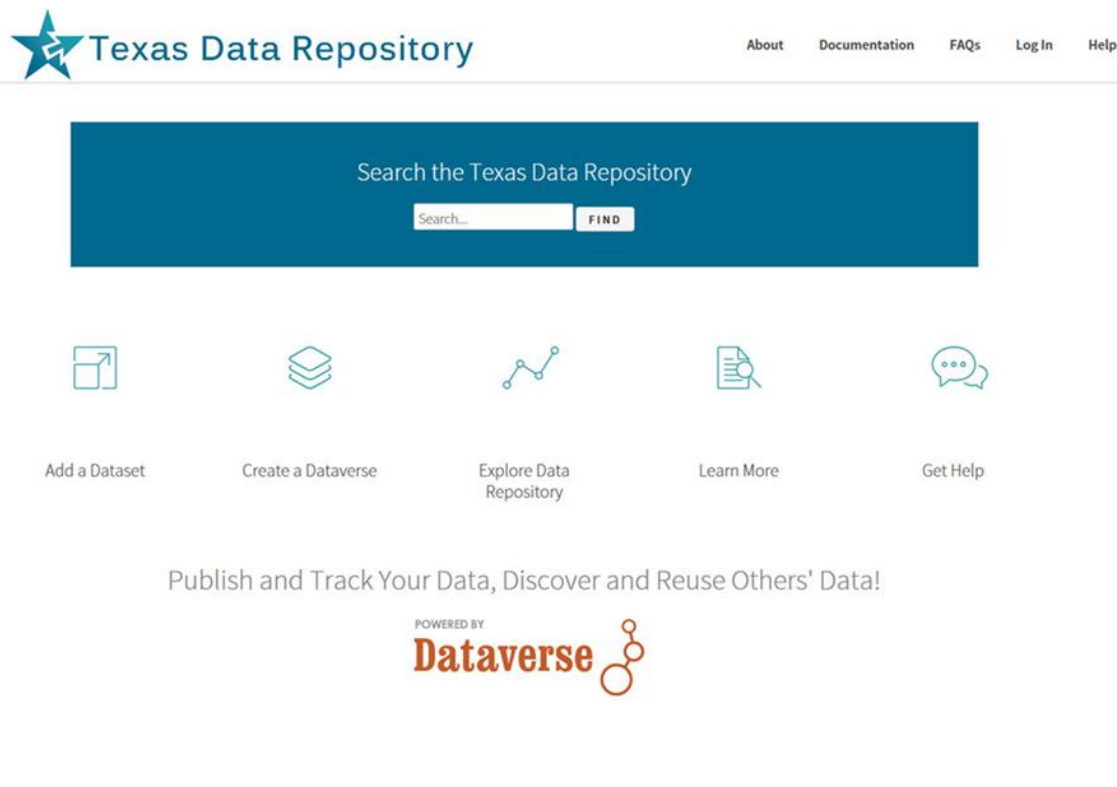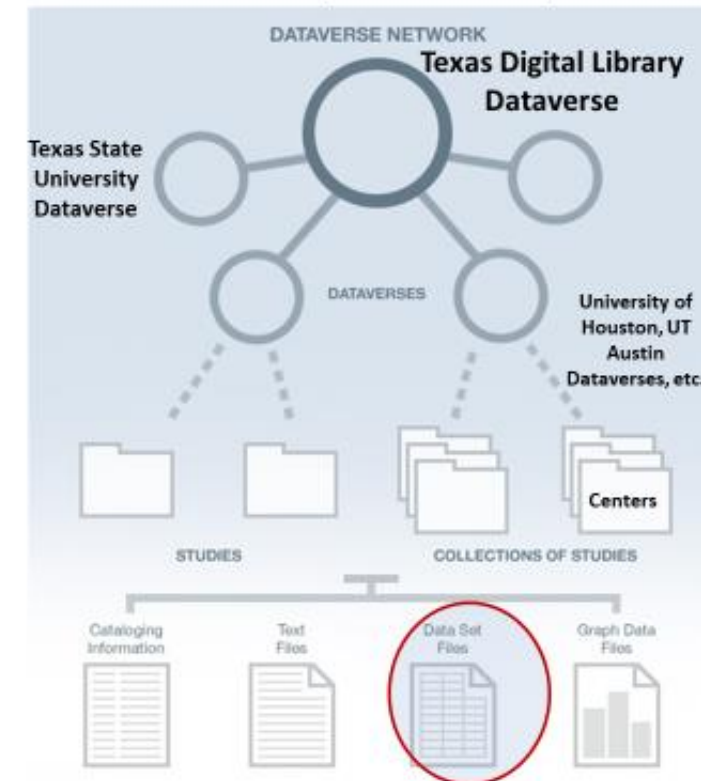
Digital Scholarly Research System
Secondary Components

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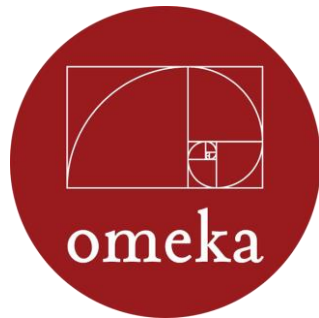
Open Source User Interface Software
allows an elegant portal or gateway entrance to digital collections
data repositories, large research projects - linking text,image
media and datasets

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

Researcher Identity Management System
ORCID

ORCID is a hub connecting the research landscape

- 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
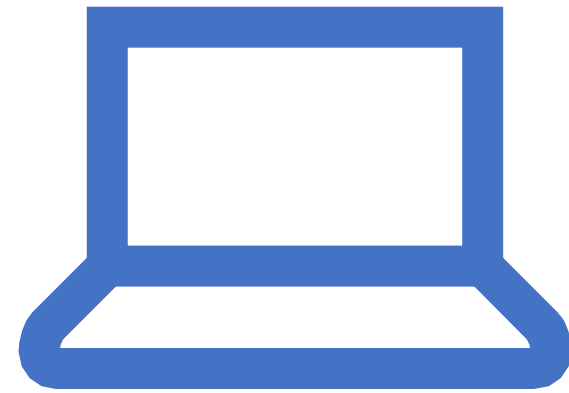
The Digitization Lab
Expands Possibilities for Faculty Research Projects

the making of Severo Perez's
...and the earth did not swallow him

ABOUT · STORY & SCRIPT · CAST · FILMING/PRODUCTION · POST-PRODUCTION · ACCLAIM & AWARDS ·

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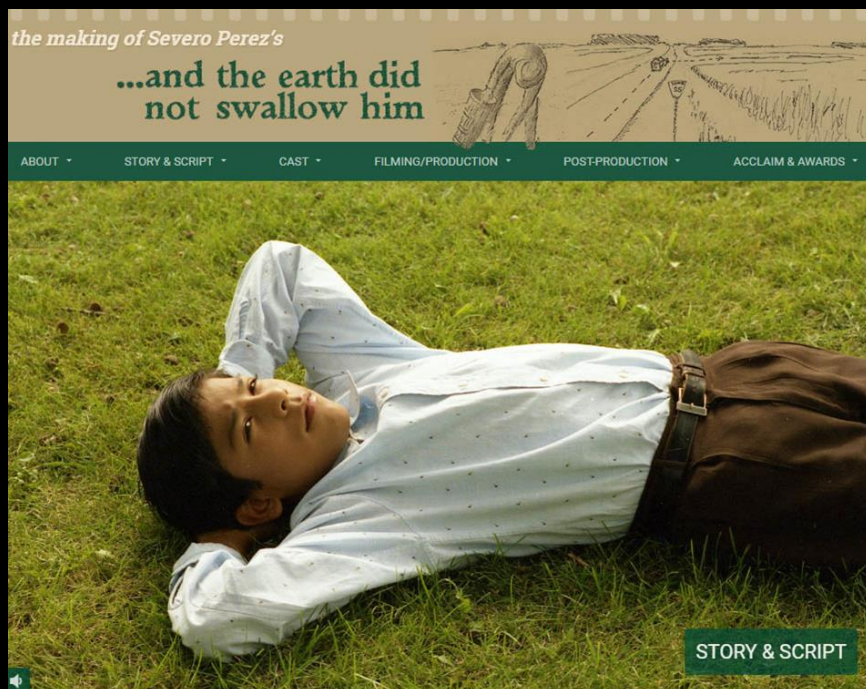
Digitization possibilities on media levels range from OCR to image, book, manuscript & journal digitization, 3D objects, posters, audiovisual material maps, GIS and visualization technologies (IIIF etc)

Combining Components System Synergies

Digital Scholarly Research Ecosystem

Combining These Research Ecosystem Components
Opens Possibilities For Digital Scholarship & Partnership Opportunities

Complexity

Projects, Prototypes
Grant Partnerships

Cognitive Cartography/Multimedia Archives
(Video, Text, GIS, Images, Field Notes)
Dick Reavis: National Tour of Texas

Multimedia, Digital Archives/Retrospective ETD Projects
(Digital video, online exhibit images, text, digital archives)
Severo Perez: And the Earth Did not Swallow Them

Online Exhibits/Digital Archives/ Online Academic Journals
(images and text, Omeka front end/Database back end, IIIF)
Cabeza de Vaca La Relacion Digitization
Santiago Tafolla: Mexican Amer. Confederate Soldier

Interactive Image Archives/Data & Research Projects
(Image libraries, Interactive Commenting/Metadata)
Texas State Flickr Commons

Digital Libraries Archiving & Documentation Projects
(Text, Metadata, OCR, Search, Zoom ability, Page Turning)
Pedagogs University Yearbooks

Faculty Digitization Proposals/Partnerships

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

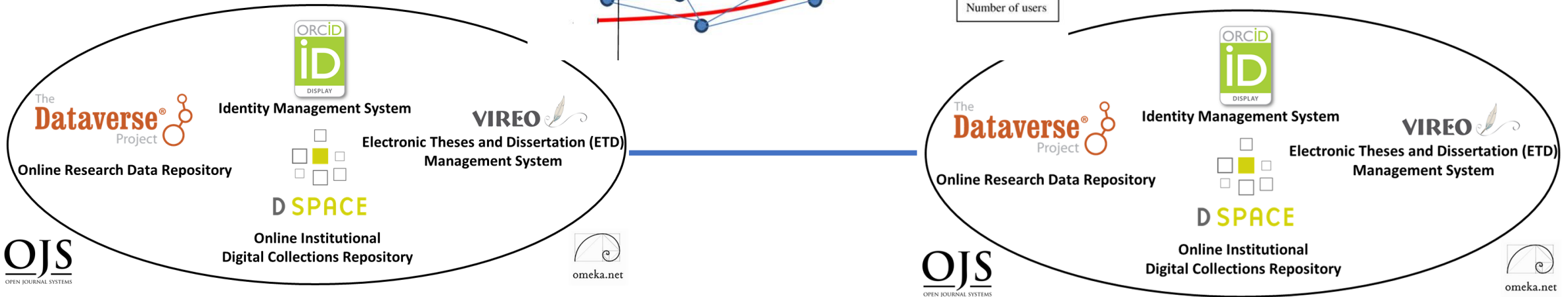- Papers in the collections repository and datasets in data repository can be associated with ORCID ID's for aggregation of research profiles. Also, the University's Faculty Profile Systems (Digital Measures)

- Further Desired Connections can also guide developmental paths for both component software and the ecosystem
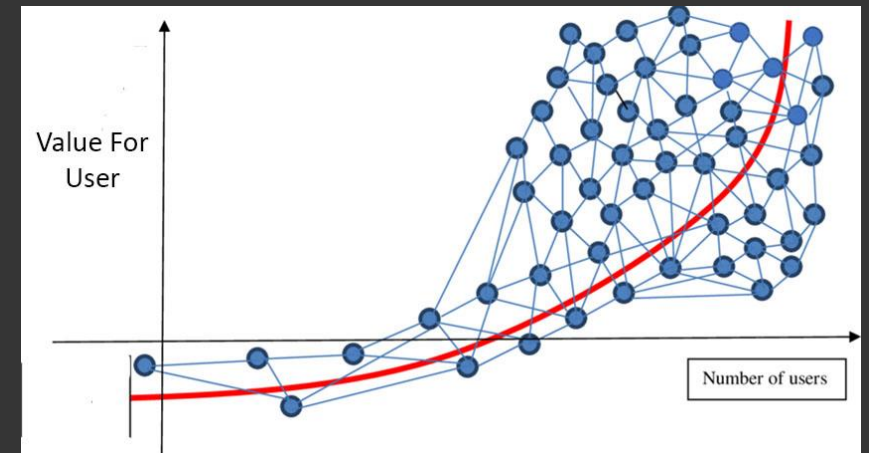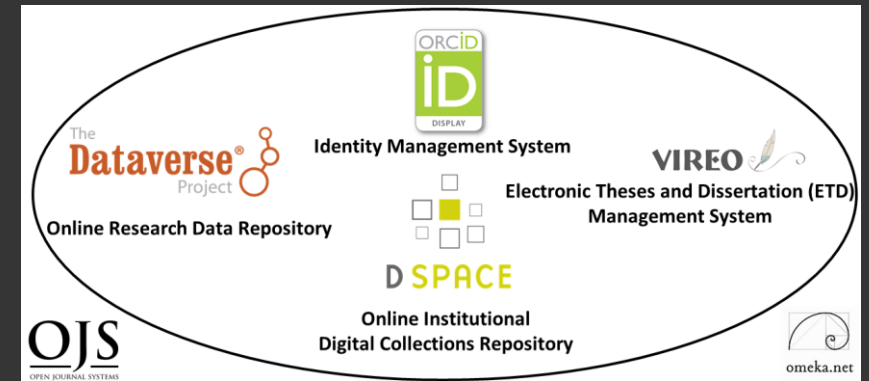
Network Effects

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

The Systemic **Value** of **Compatibly communicating components** grows as the square of their number increases.

Value For User

Number of users
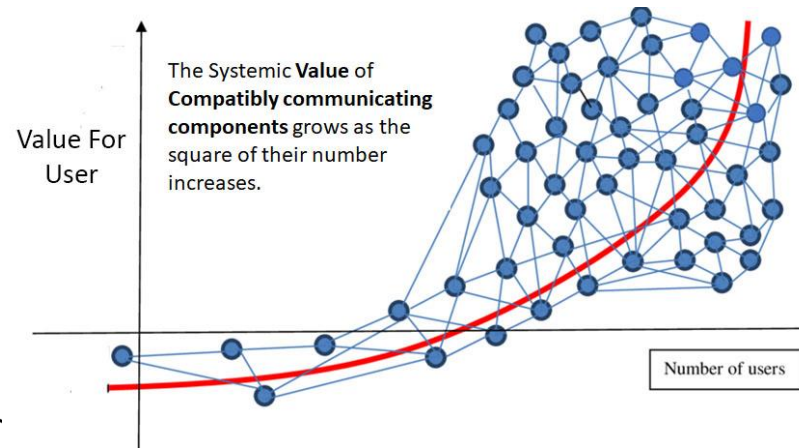
1) ORCID Aggregates from Several Sources and Networks and Connects to Other Networks, Internal and External
2) OMEKA can act as a middleware front end connecting several components and component networks internally.
    3) Digitization Lab's IIIF Framework can create internal or globally distributed 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
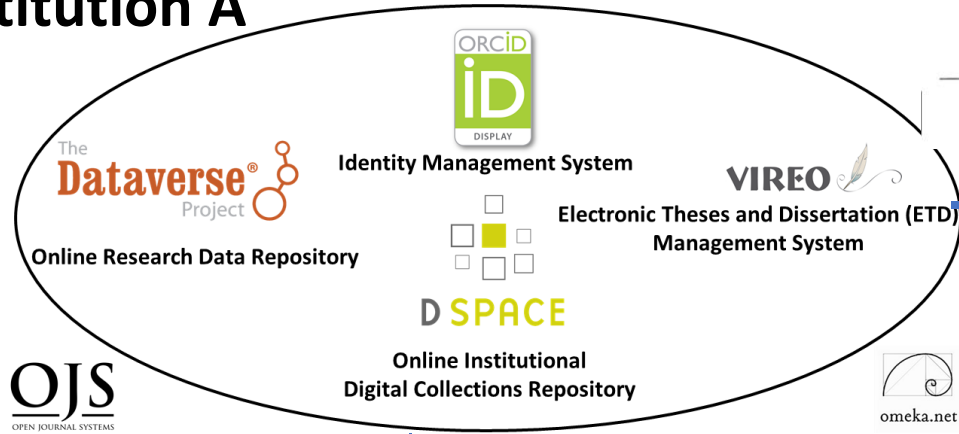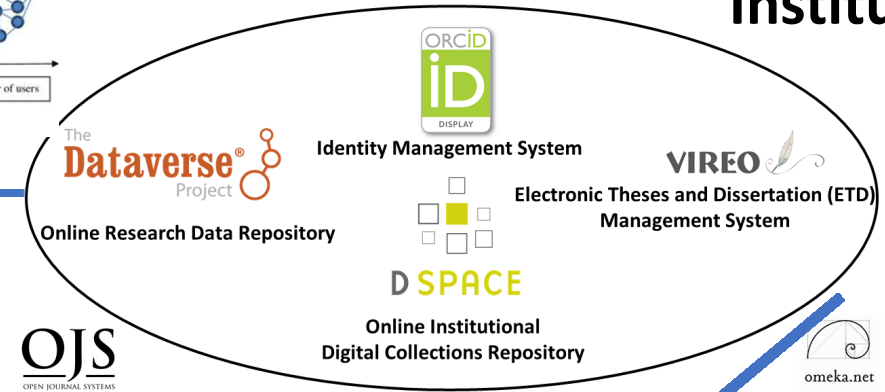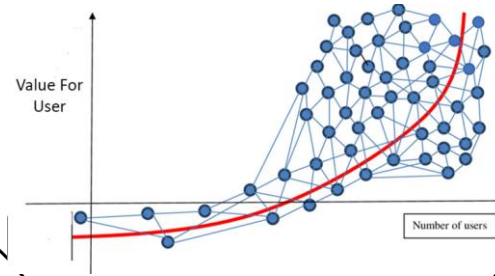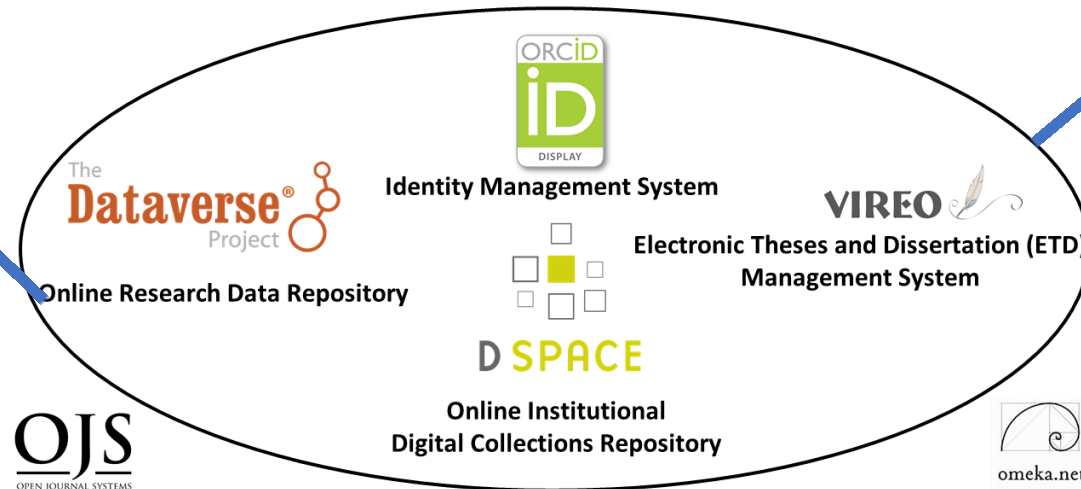
Assessment and Results
Quantitative and Qualitative Measures

Ecosystem Implemented in Stages, 2014-2019

System Downloads	2015	2016	2017	2018
DSpace	330,668	396,650	656,778	1,015,314
ETDs	158,240	200,373	328,420	470,437
Dataverse	N/A	N/A	455	3,451
ORCID ID's	190	316	438	545
OJS Journals	1	2	2	3

Annual Usage Growth (Downloads)

Making electronic resources accessible from my home or office

■ Perceived 2019   ■ Perceived 2017   ■ Perceived 2015   ■ Perceived 2013

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

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

Complexity

1) Project Completion
(Milestones)
2) Usage Statistics

Projects,Prototypes
Grant Partnerships

Cognitive Cartography/Multimedia Archives
(Video, Text, GIS, Images, Field Notes)
Dick Reavis: National Tour of Texas

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Faculty Digitization Proposals/Partnerships

Summary Reflections
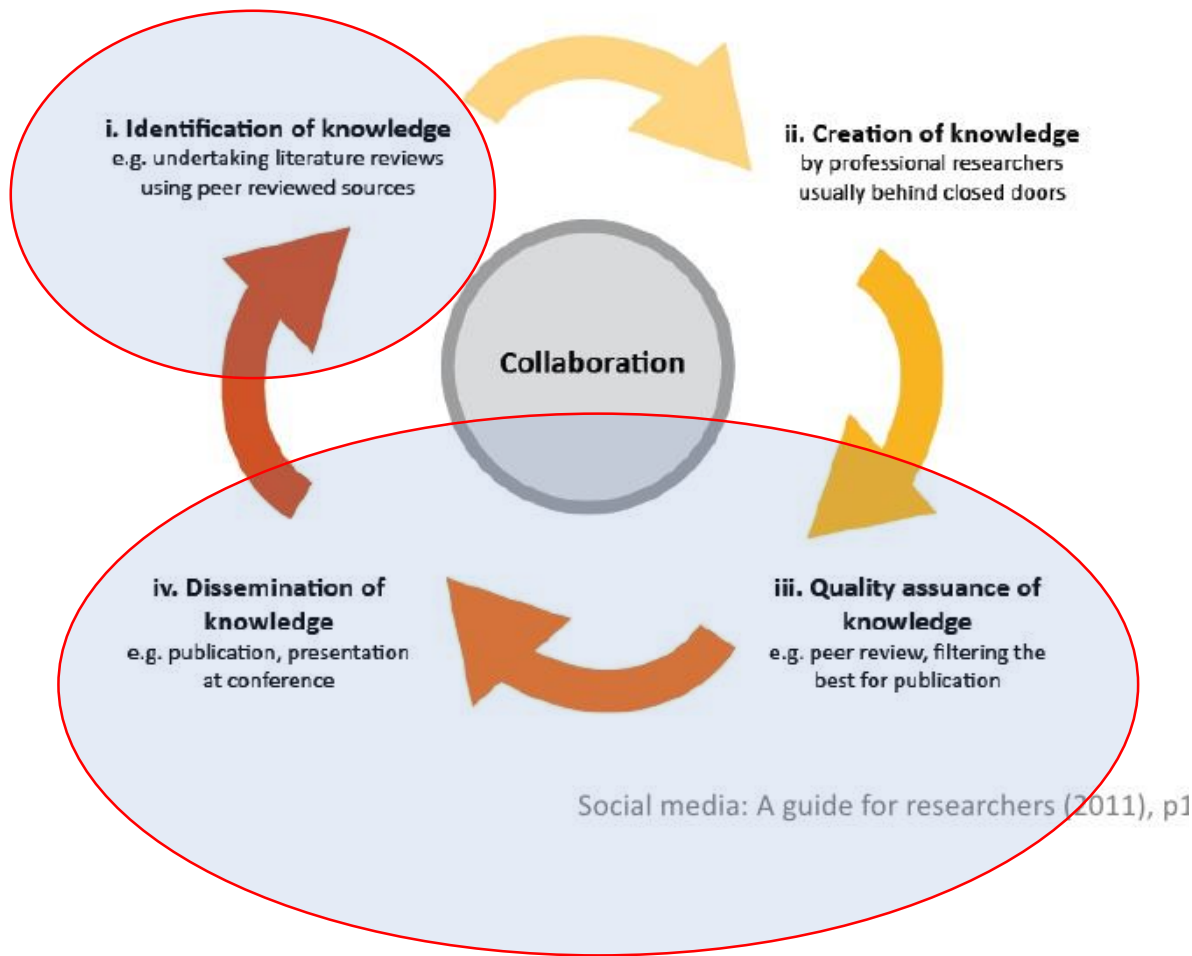
Placing Digital Scholarship Components within an Ecosystem Paradigm Usefully Enables:

1) Better Guidelines and Roadmaps for Developing Digital Scholarly Components

2) Pathways Forward and Evolutionary Possibilities for System Development

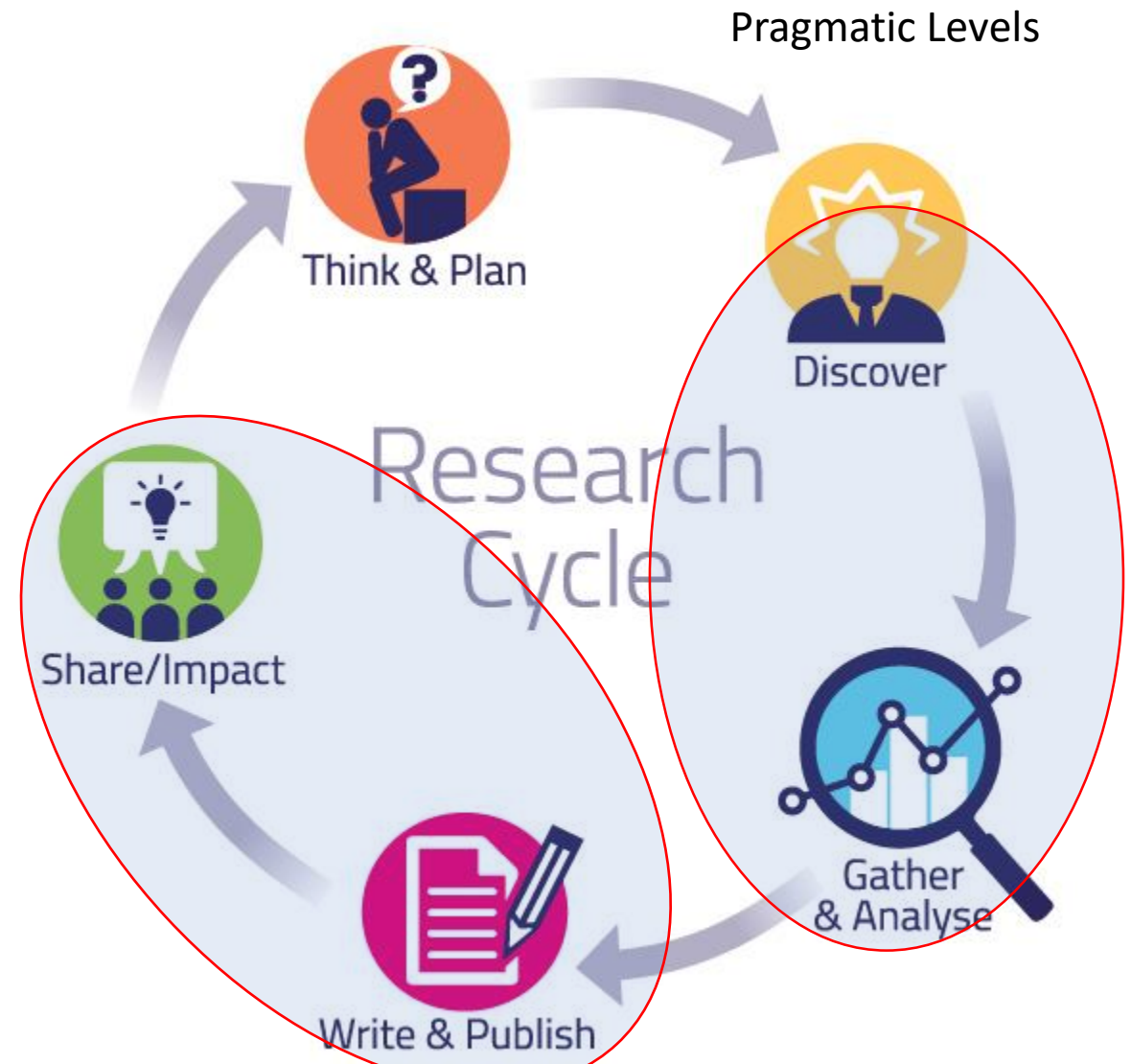3) New Possibilities For Researchers working within the academic research cycle
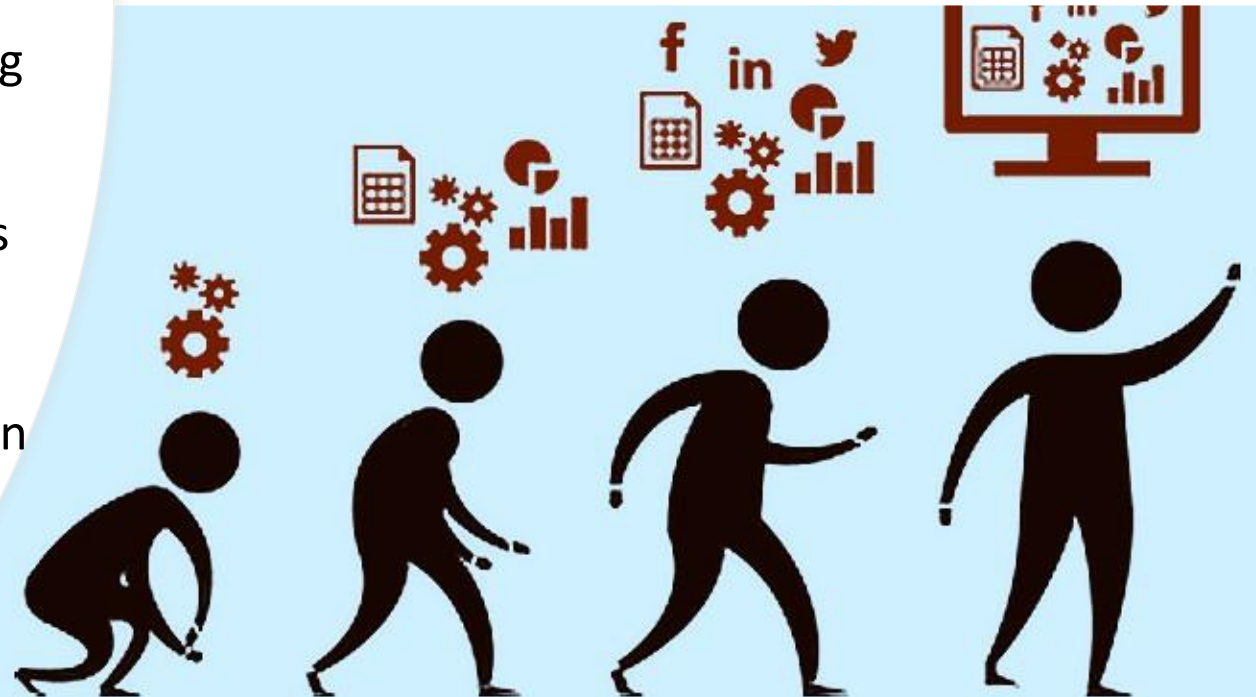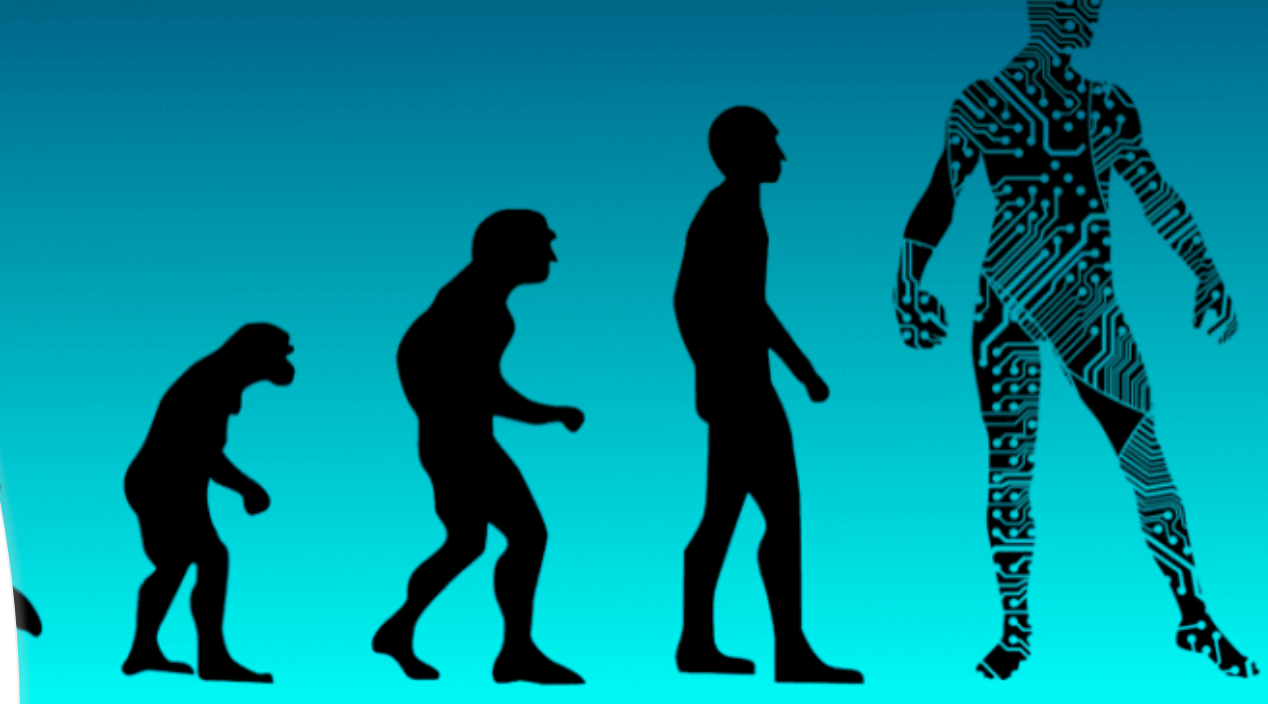
Ecosystem Components Enable
Various Parts of the Academic Research Cycle

Abstract Levels

Pragmatic Levels

The academic research cycle

i. Identification of knowledge
e.g. undertaking literature reviews
using peer reviewed sources

ii. Creation of knowledge
by professional researchers
usually behind closed doors

Collaboration

iv. Dissemination of
knowledge
e.g. publication, presentation
at conference

iii. Quality assuance of
knowledge
e.g. peer review, filtering the
best for publication

Social media: A guide for researchers (2011), p1

Think & Plan

Discover

Research Cycle

Share/Impact

Gather & Analyse

Write & Publish

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, IIIF 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**

Further References

Uzwyshyn, 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/orcid
Texas State Electronic Thesis and Dissertation Management (VIREO): https://www.tdl.org/etds/
Texas State Digital & Web Services: https://www.library.txstate.edu/about/departments/dws.html

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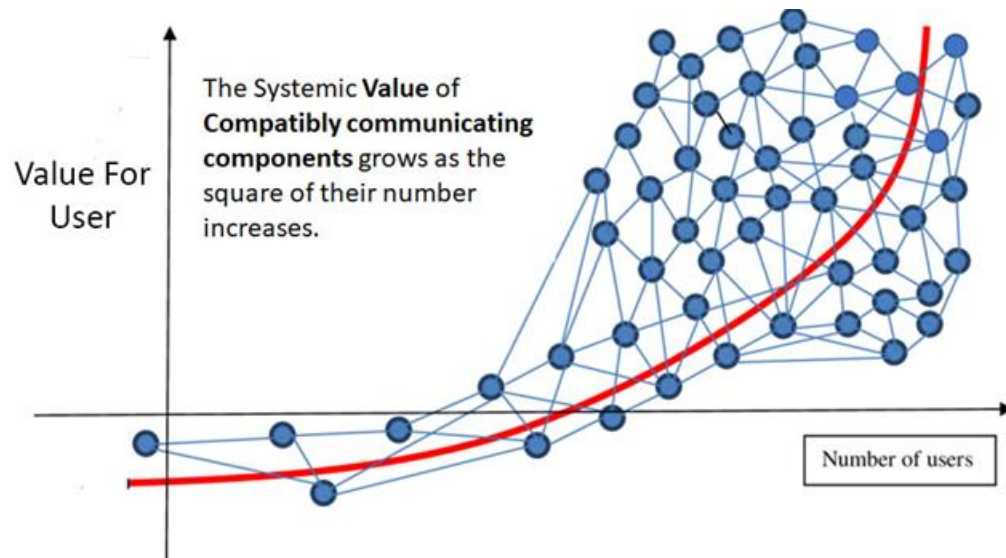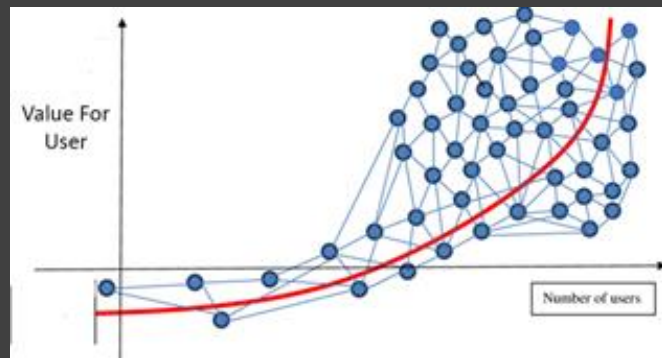
Questions, Comments

Ray Uzwyshyn, Ph.D. MLIS
Director, Collections and Digital Services
Texas State University Libraries
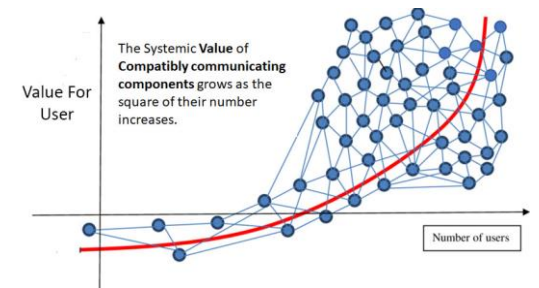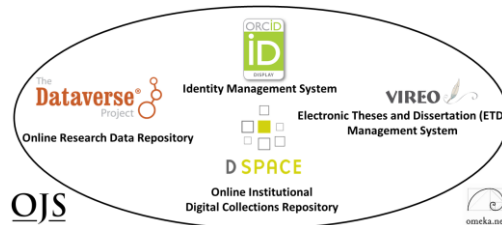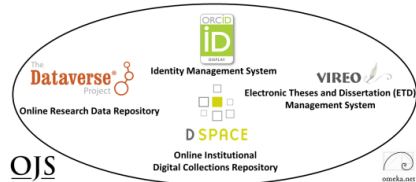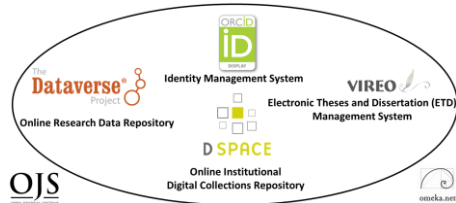ruzwyshyn@txstate.edu, 512-245-5687
http://rayuzwyshyn.net

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

The Systemic **Value** of **Compatibly communicating components** grows as the square of their number increases.

Value For User

Number of users

- **~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
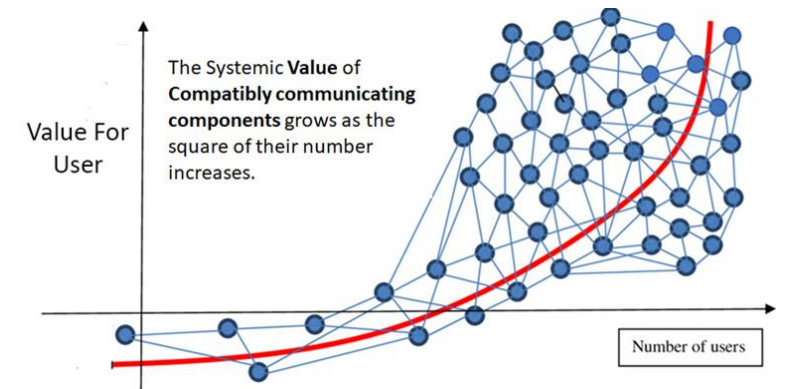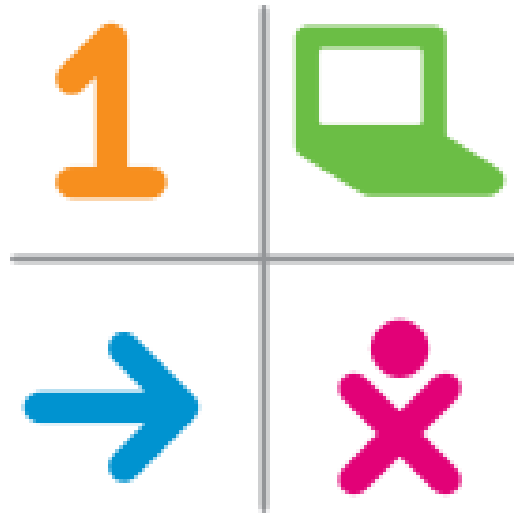
Brainstorming & Antecedent Models
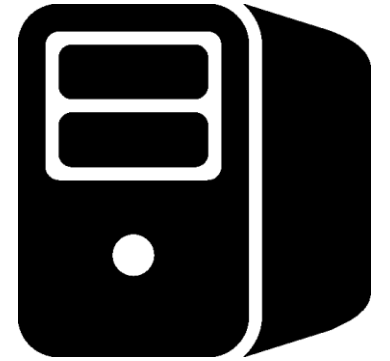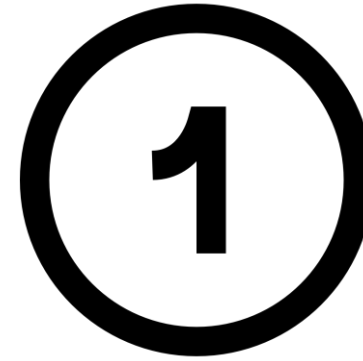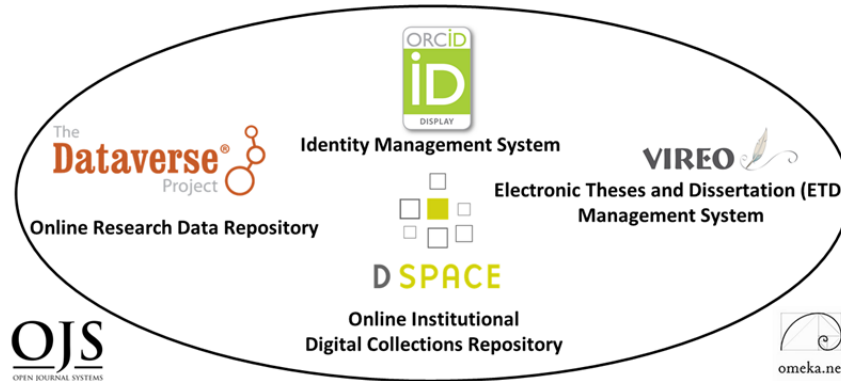## One Laptop Per Child
Dreamed up mid-late 90's, Launched 2005

• 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

The Systemic **Value** of **Compatibly communicating components** grows as the square of their number increases.

Value For User

Number of users

- **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 Supplemen**t (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