We are the change we want to see.

Carl Grant
Associate Dean, Knowledge Services and Chief Technology Officer

Ken Parker
CEO, Co-Founder

Dave King
CEO, Founder

The UNIVERSITY of OKLAHOMA
libraries.ou.edu

next thought
exaptive

Intellectual Crossroads of the University
"Complaining about a problem without posing a solution is called whining."

President Theodore Roosevelt
"Change will not come if we wait for some other person, some other time. We are the ones we have been waiting for. We are the change we seek."

President Barack Obama
My section of today’s talks

Three things I hope you’ll take away:

1. Information containers need to be further opened to unleash information’s additional value.

2. Major, new value creation is happening now on top of open information & products.

3. Collaborative environments, physical & virtual, will fuel the creation of that value.
First, set the stage
First, set the stage

Changes in Oklahoma State Funding of Higher Education, FY12-FY17

First, set the stage
First, set the stage

How we feel...
First, set the stage

**2010 Expenditures by format**
- Databases: 19%
- Books: 24%
- Journals: 57%

**2017 Expenditures by format**
- Databases: 23%
- Books: 10%
- Journals: 67%
What happened around 2007?

- “iPhone
- Hadoop (big data)
- GitHub
- Facebook (Sept 2006)
- Twitter
- Google bought YouTube (2006)
- Android launched
- Kindle released
- IBM released Watson
- Intel released high-k-metal gate microchips”

“One of the greatest leaps in history”
First, set the stage

“Every 12 months we produce 8 million new songs, 2 million new books, 16,000 new films, 30 billion blog posts, 182 billion tweets and 400,000 new products.”
First, set the stage

“By 2020, about 1.7Mb of new information will be created every second for every human being on the planet.”

“Our accumulated universe of data will grow to 44 trillion Gb.”

Bernard Marr, Sept 30, 2015
First, set the stage

How much memory?

Average laptop today: 500 Gb

“How much information do people have on hand (in their minds) – what is the size of their knowledge base?”

“1 Gb”
The sum of human knowledge has far outstripped any single individuals’ capacity to learn..

Eric Teller, CEO of Google X, pg.33
First, set the stage

Information is at a commodity status. Additional value is locked away because information is “contained” in:

- Database Silos
- Document containers (PDF, .Docx, .AZW, etc.)
- Behind paywalls
- Legal contracts/restrictions
- Clumsy/difficult access

This means the additional value of information is being held back. It needs to be unleashed. For librarians, for vendors, for people.
This lack of creativity is partly publishers’ lack of digital know-how, according to Nourry. “We, as publishers, have not done a great job going digital. We’ve tried. We’ve tried enhanced or enriched ebooks – didn’t work...but I reached the conclusion that we don’t really have the skills and talents in our companies, because publishers and editors are accustomed to picking a manuscript and creating a design on a flat page. They don’t really know the full potential of 3-D and digital,” he said.
“Unless we can see our future in a far broader context, we may not have a future.. Our territory is being lost while we think we are defending it, because we are defending the form and not the substance, and the substance is changing.”

Maurice Line

Photo: Carl Grant
First, set the stage

“Why are technology progressions so obvious in retrospect and hard to see while unfolding? Because incumbents are so proficient & knowledgeable about the status quo they are unable to see.. It’s described as the ‘curse of knowledge’.”  

page 21.
First, set the stage
But, here’s the thing; we’re all in the same boat. To create new value, we need to move from seeing the information as the source of value, to unleashing the full potential of the information via virtual tools and physical spaces.
Information containers need to be further opened to obtain that additional value and it is happening.
Further opening information containers

How is it happening?

• Open Access initiatives
• Open Educational Resources initiatives
• Grant funders want open research data
• Governments want open research data
• Researcher’s desire for greater impact

Resulting in large amounts of open data to be used.

Photo: U.S. Navy
Further opening information containers

When will it happen?

According to this just released study, peer-reviewed study: “The state of OA: a large scale analysis of the prevalence and impact of Open Access articles”... sooner than you think.

https://peerj.com/articles/4375/
Further opening information containers

Where will it happen?
Libraries are the best labs available!!
New value creation is happening now

Why use the (right) library as a test lab??

“Libraries lead Higher Education Change because:

• Experienced in Change Management
  • From purchasing journals to licensing databases
  • From housing books to providing collaborative work spaces

• Strong set of Campus Relationships
  • Terrific position to catalyze change. Work with faculty, administrators, students and serve on campus committees.

• Physical Presence
  • Heart of campus
  • A place of gathering, solitude, connections and contemplation.”

Why use the library as your test laboratory? (page 2)

• We have a large and rapidly growing repository of open texts (open access, OER’s, HathiTrust, more….) to use
• Plus we have access to a LOT of licensed content
• We’re increasingly expressing knowledge in new formats
• We’re the intellectual crossroads. Ideas get refined and polished as a result.
• The Library is the test-lab for the entire campus.
• The OU Libraries have a door count of over 1M/year.
• Some libraries are really innovative and entrepreneurial!
New value creation is happening now

https://masterplan.libraries.ou.edu/publication
“The MISSION of LIBRARIANS is to IMPROVE SOCIETY through FACILITATING KNOWLEDGE creation in their COMMUNITIES”

“So what should we be spending our precious resources on? Knowledge creation tools, not the results of knowledge creation.”

Pg 43. - R. David Lankes
New value creation is happening now – Physical Space

Intellectual Crossroads of the University
New value creation is happening now – Physical Space

Intellectual Crossroads of the University

The UNIVERSITY OF OKLAHOMA
New value creation is happening now – Physical Space

Digital Scholarship Laboratory

Intellectual Crossroads of the University
New value creation is happening now – Physical Space

Getting Started workshops

Come to one of our 1-2 hour workshops and learn about these exciting technologies you can get started with them. These workshops are open to all OU students, staff, and faculty.

- 3D Print Workshop
- Virtual Reality Workshop
- Microcontroller Workshop

Virtual Reality

- OVAL
- Developing for Virtual Reality
- VR Videos

3D Printing

- What is a 3D printer?
- 3D Printers
- Lynda.com Training Videos

Software Carpentry

- What is a Microcontroller?
- SparkFun Inventor Kits

Teaching basic lab skills for research computing
New value creation is happening now – Physical Space

Learning Lab

The “before” pictures
New value creation is happening now – Physical Space

The “after” pictures
New value creation is happening now – Physical Space
New value creation is happening now – Physical Space
New value creation is happening now – Physical Space
New value creation is happening now – Physical Space
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New value creation is happening now – Physical Space

DATA CONSORTIUM

CONTACT US

Zarrow Family Faculty and Graduate Student Center
Bizzell Memorial Library
401 W. Brooks St.
Norman, OK 73019
Read more
Email

The Data Analytics, Design, and Evaluation Consortium (DADEC) supports OU community members with their data needs. Consult with specialists and graduate assistants who are familiar with working with data, including management, analysis and visualization. With the ability to ask questions and receive guidance, DADEC is the focal point to help faculty, researchers, and students work with their data.
New value creation is happening now – Physical Space

INNOVATION @ THE EDGE
THE UNIVERSITY OF OKLAHOMA LIBRARIES
CONNECTING YOU TO THE INNOVATION HUB

Intellectual Crossroads of the University
New value creation is happening now – Physical Space

This was a student break-room before we converted it (250 square feet).
New value creation is happening now – Physical Space

It is:

• Combination of Makerspace/FabLab/Startup Incubator, Classroom, Seminar Room, Laboratory – Applied work space.

• A culture (or mindset) of experimentation/knowledge creation with the latest hardware and software.

• Community

• Collaboration
New value creation is happening now – Physical Space

College of Law built a new collaborative commons based on our experiences and put two of the VR stations in their space.
New value creation is happening now – Virtual Space

Report: VR and AR Headsets to See 50% Growth Every Year Through 2021

By Joshua Bolkan | 10/02/17

“Cheap, abundant VR will be an experience factory. We’ll use it to visit environments too dangerous to risk in the flesh, for experiences we can’t get as humans..” (Page 229)
New value creation is happening now – Virtual Space

“The real power of virtual reality may lie in bringing us closer to reality. It isn’t always pretty, but it has the potential to effectively foster empathy and learning in a world made weary by too much of the same information.” (emphasis is my own)

Dan Costa, Editor, PC Magazine
February 2018 Edition
VR “is an entirely new medium, with its own unique characteristics and psychological effects, and it will utterly change how we interact with the (real) world around us, and with other people.”

Jeremy Bailenson, Experience on Demand Page 11.
Reshaping Pedagogy

“Finally having some time to watch the videos and reflect... I am deeply moved. I have been trying to teach my students spatial skills for 10 years now. I have gone from chalk and cardboard refrigerator boxes in the Lloyd Noble parking lot in my first trials to now working with you and using the OVAL platform. The impact on the students this week was immeasurable and the impact on me has been profound.

Professor Elizabeth Pober,
College of Architecture
New value creation is happening now – Virtual Space

Cancer Research with VR

“Your session provided an opportunity to visualize the future development in the technical area, and to evaluate the potential clinical applications of new display methods. Your medical image database is wonderful. Students are happy to be able to “touch” the lung tumor displayed in virtual 3D”

Dr. Hong Liu
New value creation is happening now

Bill Endres (University of Oklahoma professor in English) is wowing the global community with his digital humanities work, including 3D printed pages of the St Cad Gospels. He says, "They were lauded as likely the world's first 3D printing of a manuscript page."

At the International Medieval Congress in Leeds, UK, people loved my 3D printed pages of the St Cad Gospels. They were lauded as likely the world's first 3D printing of a manuscript page. However, my favorite comment was: "I have now touched the Internet! (I have interactive 3D renderings on my website)"

St Chad Gospels

Made around 730, the St Chad Gospels is an exquisite blend of Irish and Anglo-Saxon influences. It shows strong correspondences with the Lindisfarne Gospels, which predate it slightly, and the Book of Kells, which it predates by about 70 years. The St Chad Gospels contains the earliest surviving examples of Old Welsh writing.
Value creation is going to happen – Virtual Spaces

Which can them be pushed directly to one of our VR stations in the Library.
New value creation is happening now
Finding the Spider Monkey
New value creation is happening now
Finding the Spider Monkey
September 2017 - 1st time ever, that a Virtual Reality Class was held in H.E. across 7 remote locations (2 in Arizona, 5 in Oklahoma), 15 total participants, with an instructor in Arizona giving a tour of a cave, pointing out archaic cave art.
E-books: “The real magic will come as each word in each book is cross-linked, clustered, cited, extracted, indexed, analyzed, annotated and woven deeper into the culture than ever before. In the new world of e-books, every bit informs another, every page reads all the other pages.”
New value creation is happening now – Virtual Space
New value creation is happening now – Virtual Space

Building a New Research Services Platform

Development partnership with five universities:

- Lancaster University
- The University of Iowa
- University of Miami
- The University of Oklahoma
- The University of Sheffield

Five Partners Join Ex Libris in Developing New Research Services Platform

Leading universities in the United States and the United Kingdom collaborate with Ex Libris to maximize visibility, efficiency, and compliance of research activities

Jerusalem, Israel—February 08, 2018. Ex Libris®, a ProQuest company, is pleased to announce the establishment of a development partnership with Lancaster University, the University of Iowa, the University of Miami, the University of Oklahoma, and the University of Sheffield. The partners will collaborate on the development of a new end-to-end research services platform, Ex Libris Esploro. This development program will give the partners a significant

Intellectual Crossroads of the University
New value creation is happening now – Virtual Space

Digital Scholarship

Gale is developing a research experience that will provide critical infrastructure for digital scholarship research. By combining digital text and analytical tools on one intuitive platform, researchers and instructors will be able to gain insights through both distant reading and close analysis—along with the ability to configure the tools and content set to meet their specific needs.

About Janux
Janux connects learners from around the world in an online social learning environment. It’s the first platform of its kind and allows users to share notes, watch high quality course videos, and much more. With courses available for credit and just for fun, OU and NextThought are shaping the future of education.

Masters Programs

- Data Science & Analytics
- Global Affairs
- Master of Arts in Data Science and Analytics
- Master of Arts in Global Affairs
Three things to take away:

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Personal Blog: http://thoughts.care-affiliates.com
Connected!

Connections are EVERYWHERE – USE THEM!

Ken Parker
NFAIS 2018 Annual Conference
01-Mar-2018
Connected!

- The Nature of Nature
- Human Connections
- Education
Discussion

Where do you see connections in Nature?
Connections
Connections – Scale?

Cosmic Web: $10^{+25}$ m

Nerve cells: $10^{-7}$ m

https://www.sciencedaily.com/releases/2018/02/180214093712.htm
“Single cell?”
Single cells!

How Bacteria Help Regulate Blood Pressure

https://www.quantamagazine.org/how-bacteria-help-regulate-blood-pressure-
Connected!

- The Nature of Nature
- Human Connections
- Education
Discussion

How are connections changing humans economically, socially, physically, emotionally?
“Social” – Connected Species

- Made to Connect
- Harnessing it?
Tech-Enhanced Connections

THE INEVITABLE
UNDERSTANDING THE 12 TECHNOLOGICAL FORCES THAT WILL SHAPE OUR FUTURE
KEVIN KELLY
AUTHOR OF WHAT TECHNOLOGY WANTS
Accessing, Exchanging

• Access or exchange – not own
  • Streaming, connecting, aggregating
• My wants: what, when, where
• Platform! Connect and Exchange
• Communities create the value
• Data-driven, personalized
Sharing

• Everyone creates and it’s all shared
  • Code, knowledge, judgment, photos
• Cooperation
• Collaboration
• Collectivism
• Connections!

60,000 person-years

2.13B (+17% YoY)
Remixing

• New = remix of existing
  • Radical deconstruction, find, recombine and transform
• Digital accelerates and democratizes

• Products, tools, skills, courses
Connected!

- The Nature of Nature
- Human Connections
- Education
Discussion

How can connections help education?
Learning communities: great education

- Tutors, apprenticeships, internships
- Culture, expectations
- Support
- Motivation
- Engagement
- Retention (memory & involvement)
- Far “Beyond content”
- Technology enables community with scale, access, efficiency

Tutored average student > 98% peers

Learning Community

- Platform to connect students
- Alumnification
Imagine education that harnesses…

• Learning communities

• Alumnification

• Internet access = education excellence available to all
Connected!

- The Nature of Nature
- Human Connections
- Education
Effective number of researchers (right scale)

U.S. TFP Growth (left scale)

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Summary: This table contains a comprehensive overview of various cognitive science projects and research areas, highlighting the contributions of several leading researchers and their respective areas of expertise.
Cognitive City Team Builder

City Metrics

143 Scientists
143 Artifacts
477191 Possible Teams

59414 Possible Teams with Some Overlap

Teams

Possible Teams with Some Overlap

Score: 15
Teams: 11373 (25833 PPM)
Score = 15
11,373 teams like this
Score = 15
11,373 teams like this
Score = 63
Only 2 teams like this – 4 parts/million!
City Metrics

143 Scientists
143 Artifacts
477191 Possible Teams
59414 Possible Teams with Some Overlap

Teams

165 Teams with Kenyan Members
37 Teams with Kenyan Members and Some Overlap
6 Teams with Kenyan members, a Clinician, and a Tuberculosis Expertise

Create New Team Criteria
Teams with Kenyan members, a Clinician, and a Tuberculosis Expertise
This study examined peripheral catecholamine-O-methyl-transferase (COMT) gene expression in obsessive-compulsive disorder (OCD) patients and healthy controls. Participants included 33 first-episode OCD patients and 33 age- and sex-matched healthy controls. Relative COMT gene expression levels were examined by real-time quantitative reverse transcription polymerase chain reaction (RT-PCR) in peripheral blood of all the subjects. COMT gene expression levels, normalized by glyceraldehyde-3-phosphate dehydrogenase (GAPDH), were significantly decreased in the OCD group compared with healthy controls (P = 0.044; p = 0.007 in the sample as a whole). COMT gene expression down-regulation of male OCD patients relative to male controls is 0.38, and that of female OCD patients relative to female controls is 0.73. These results suggest that COMT gene expression down-regulation might play an important role in the development of OCD, and that there may be gender differences in this alteration.

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• The Islamic psalm texts
  • A sample psalm: David and Uriah in heaven
  • Old diagram
  • Updated diagram

• Portraits of David
  • Psalmist & sinner
    • Reorderings
    • Database
    • Correspondences
Thank you!

Dave King
king@exaptive.com
@dking513
In summary

Carl talked about how new value can be created using transformed information:
1. How information containers need to be further opened to unleash information’s additional value, why, when and where
2. Showed how major, new value creation is happening now on top of that open information.
3. New collaborative environments, physical & virtual, that fuel the creation of that value.

Ken talked about connections and how they will add value in transforming information:
1. The nature of nature and the value of connections there
2. Human connections
3. Education and how it can leverage connections to increase value

Dave talked about how to increase researchers productivity and thus value:
1. The number of researchers vs. the productivity of research
2. How technology can be used to create boundary markers to increase research productivity by reaching across disciplines, yet bringing researchers together.
3. He showed some case examples, including one at the University of Oklahoma