Current Health and Future Wellbeing of the American Research University

Research University Futures Consortium
“Academic Research is going through a lasting transformational change of historic scope and scale.”
“Far and away the best prize that life has to offer is the chance to work hard at work worth doing.”

Teddy Roosevelt
Remains of what archaeologists believe was the first politician
The American Research University

✓ Current and Future Environment
✓ Changes and Challenges
✓ Solution-Based Opportunities
✓ Tactics and Strategies
The American Research University

- Current and Future Environment
- Changes and Challenges
- Solution-Based Opportunities
- Tactics and Strategies

Research University Futures Consortium
“When the rate of change outside an organization exceeds the rate of change inside, the end of the organization is in sight.”

Jack Walsh
Captain Hindsight
Captain Hindsight

Shoulda, Coulda, and Woulda
Research Program Development and Administration

“An Increasingly Complex Business”

• Hypercompetitive, Interdisciplinary, Globalized
• Increasing Institutional Expectations
• Multiple Points of Failure (known and unknown)
• Regulated and Scrutinized (compliance)
• Increasing Reporting (ARRA)
• Underappreciated Management / Leadership Challenges
• Growing Levels of Frustration
• No Easy Solutions
What science is really worth

Spending on science is one of the best ways to generate jobs and economic growth, say research advocates. But as Colin Macilwain reports, the evidence behind such claims is patchy.
Michael Faraday

Dynamo & Motors
“Why sir, there is every probability you will be able to tax it.”

Michael Faraday
Crunch time for US science

Researchers must make a stronger case for funding in the face of a perfect storm of budget cuts and eroding political support, says Jay Gulledge.
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The Competitiveness and Innovative Capacity of the United States

Prepared by the U.S. DEPARTMENT OF COMMERCE
In consultation with the NATIONAL ECONOMIC COUNCIL

JANUARY 2012
2001-2011 State/Local funding per student declined by 24%
Fed, State, Local spending per student at 25-yr low (inflation adjusted)
$1-Trillion in outstanding student loans (94% students borrow)
Percent of Academic R&D Financed with Institutional Funds

- Public University Institutionally Financed R&D
- Private University Institutionally Financed R&D
“Research Arms Race”
Research Project Grants
Competing applications, awards, and success rates
R01-Equivalent grants, New (Type 1)
Success rates, by career stage of investigator
Share of published journal articles, 1996-2020 (projected)
Productivity per Researcher

- Patents
- Articles
- Competencies
- Usage
- Highly-cited articles
- Citations

- UK
- China
- Germany
- Japan
- USA
- World Average
From Outputs to Productivity

Charles Holliday, former chief executive of DuPont Chemical and President of the Board of City Bank, chairs the National Research Council – Committee on Research (a panel of 22 university and corporate leaders).

When pushed to support continued, if not additional Federal and State funding, his response, “I want ways of measuring the productivity of research universities.”
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The issue is not whether universities are of value, but are they operating at “maximum productivity”? 
Continuous Evolution with Periods of “Revolution”

“The Good”

✓ Morrill Act of 1862 (expanded in 1890 and 1994)
✓ GI Bill of 1944
✓ National Defense Education Act of 1958
✓ Pell Grant Program, 1965
Continuous Evolution with Periods of “Revolution”

“The Bad”


1980-2009, Reductions in public funding support by 1% per year (approx. 30%).

- Demographic Shifts
- Political-Public Priorities
- Cost Increases Beyond Inflation Rate (regulations, equipment, arms race)
- Poor Confidence in Higher Education (efficiency and effectiveness)
“The Revolution” (Not Business As Usual)

“The Ugly”

2009-2011/12, additional 15-20% base budget reductions in State Funding.

✓ Program Cuts
✓ Hiring Freezes
✓ Suspended Capital Programs
✓ Furloughs and Salary Cuts
✓ Market Limit Increases in Tuition
✓ No National Academic Research Strategy
Sept 2, 2010

Schumpeter
“Declining by degree”

“This luxury model is unlikely to survive what is turning into a prolonged economic downturn. Parents are much less willing to take on debt than they were...”
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Will America’s universities go the way of its car companies?
“...revised outlook to stable from negative only for the diversified market-leading colleges and universities in the public and private sectors. Market leaders have global reputations, multiple revenue-generating sources, strong student demand that justifies higher tuition, strong competitive and diversified externally funded research, and philanthropic support.”
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“The large majority have negative ratings and typically have a more regional student draw, weaker pricing power, limited ability to compete for external research and philanthropic/foundation funding.”
“State of the Industry”
Kimberly Tuby, VP Moody’s Investor Services

Drivers of the financial health of American universities:
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- Weakening prospects of tuition increases (pricing elasticity and competition)
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- Weakening prospects of tuition increases (pricing elasticity and competition)
- Pressure and increasing competition for non-tuition revenue (research and philanthropy)
- Lack of strong management of operating costs, risks, and capital (physical and intellectual)
“Control your own destiny or someone else will.”  Jack Welch
The Challenge/Problem is Painfully Clear
The “Standard Solution” has Worked Before...
Same Solution – Once Again
“Imagination is more important than knowledge.” — A. Einstein
Success comes from innovations that fundamentally changes the terms of what it means to have a “competitive advantage.”
Economics of Higher Education

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“...we cannot rely on traditional sources of funds, we must identify new sources of funds, or find ways to reduce the cost of our enterprise without sacrificing its quality.”

George Breslauer, UC Berkeley
Economics of Higher Education
Economics of Higher Education

What I'm about to tell you is gonna change your life forever. Are you really sure you want to know it?
Economics of Research and Innovation

“Winner-take-all” Competitive System

Small difference in performance translates into large difference in rewards. Unsuccessful competitors have little to show from the investment.

“An auction where everyone pays, but only the winner benefits.”
"Winner-take-all" Competitive System

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2). Uneven playing field – success is more likely for those who are adept at the game and have a track record of success. Success is determined by relative standing and less by discrete results.
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3). Because strategies for success are ill-defined and change, challengers mimic the strategies of those at the top rather than looking for game changing approaches.

"Sure, I follow the herd—not out of brainless obedience, mind you, but out of a deep and abiding respect for the concept of community."
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3). Because strategies for success are ill-defined and change, challengers mimic the strategies of those at the top rather than looking for game changing approaches.

4). Rewards and recognition accumulate to the most successful and are highly visible, which encourages others to get in the game or continue to play, even if they lose more often than they win.
5). When there are too many contestants, they are motivated to engage in unproductive spending (often patterned after the characteristics of previous winners) in a losing effort to gain a “competitive advantage.”
Economics of Higher Education

“The Red Queen”
Economics of Higher Education

“The Red Queen”

“...it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”

Through the Looking Glass, Lewis Carroll
The result is that all contestants “RUN HARDER TO STAY IN THE SAME PLACE” and those who choose not to play or can no longer afford the game, quickly slip out of the market.

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Run Smarter – Not Harder
UK Study: Exploratory
21 Universities (54% of funding)
“Semi-structured” Confidential
Interviews
Workshops

http://www.researchdatatools.com
UK Study: Exploratory
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Workshops

Findings:

- Identified common set of information needs.
- Identified key performance indicators.
- Need for high level frameworks regarding data collection and sharing.
- Lack of uniformity in data collection and reporting (collecting and measuring because we can, not because it is important).
- No IT strategy or one that is owned and guarded by the IT department.
- Historical and reactive data rather than information that anticipates change and informs decisions.

Value: Exceptionally well received by the academic community, funders, and suppliers.

Follow-up: Second “Solution-Driven” Project
Current Health and Future Wellbeing of the American Research University

Research University Futures Consortium
U.S. Project Goals and Design

- Initiate and contribute to a discussion on a national academic research strategy.
- Assess the current and future challenges and barriers to sustain and enhance university based research and innovation.
- Develop solutions and pathways for their implementation.
- Find a Sponsor.
The world’s leading publisher of science and health information, serving more than 30 million scientists, students and health and information professionals worldwide. A global company headquartered in Amsterdam, employing more than 7,000 people in 24 countries.

Global community of 7,000 journal editors; 70,000 editorial board members; 300,000 reviewers and 600,000 authors.

Publishes around 2,000 journals and close to 20,000 books and major reference works.
University visits (25, public and private).

Confidential discussion interviews with Vice President/Chancellor for Research, directors of research offices, IT directors, and staff responsible for the administration of research.

High level links and contacts in major stakeholder organizations.

Workshop and group discussions with project participants and others.

Detailed summary report, guidance, and share good practices.

Publication and wide dissemination of summary findings through freely available printed reports, web resources, and meeting presentations.

Next steps?
U.S. – Study: Purpose and Objectives

- A broader understanding and wider appreciation of the challenges related to research program development and administration.
- A bottom-ups understanding of current research management systems and the leadership landscape and challenges.
- Focus on how management and performance data is being gathered and used to inform strategic decisions and evaluate success at a variety of levels.
- Not a system, solution-driven, or problem specific study (Exploratory).
- Develop an understanding of evolving institutional needs (information intelligence, leadership, strategy, and tactics) that are independent of specific disciplines or institutional type.
Private:
- Emory
- Vanderbilt
- Yale
- Rochester
- Carnegie Mellon
- Wash U St. Louis
- Duke
Research University Futures Consortium

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**Large Public:**
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- Ohio State
- Penn State
- Maryland
- Minnesota
- Texas
- UCOP
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- Texas
- UCOP

#### Public:
- Arizona State
- Colorado State
- Florida State
- UC Riverside
- Kansas
- Kentucky
- South Florida
- Wash. State
- Utah
- Georgia
- Tennessee

25 Universities (Research = $9B+ )
Strategy and Vision:
✓ Strategic objectives and operational strategy.
✓ Program specific tactics.
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Organization Structure and Evolution:
✓ Support and coordination between administrative units.
✓ Budget and staffing levels – strategic or reactive?
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✓ Factors driving priority based decisions.
✓ Use of evidence-based resource distributions.
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Performance Management and Reporting:
- Key performance indicators.
- Levels of aggregation.
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Future Directions and Critical Priorities
“Selected” Emerging Findings - Themes
“Selected” *Emerging* Findings - Themes

Difference in the Levels of Concern and Urgency
“Selected” Emerging Findings - Themes

Growing Administrative / Management Stress
“Selected” Emerging Findings - Themes

Growing Administrative / Management Stress

Poor Understanding and Appreciation
“Selected” Emerging Findings - Themes

Ranking / Measurement Systems
“Selected” Emerging Findings - Themes

Ranking / Measurement Systems

Information / Decision Support Systems

“It wasn’t an easy decision for me to make. Lots of coin tossing went into it.”
“Selected” Emerging Findings - Themes

Political and Sponsor Priorities
“Selected” Emerging Findings - Themes
“Selected” Emerging Findings - Themes

Unintended Consequences
“Selected” Emerging Findings - Themes

Unintended Consequences

- Institutional Differentiation
- Capacity Consolidation
- Program Fragmentation and Isolation
- Loss of Critical Mass
- Disengagement and Loss of Mission
- “National” Universities
Changes and Challenges
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Shifts in public policy and population demographics, increases in the number and type of competitors, declining public funding support, increasing operational costs, greater performance expectations, and declining pricing power all make “productivity” and “cost effectiveness” increasingly important.
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Most universities have the systems in place to recognize (perhaps predict) that they are in trouble, but many lack the management expertise and experience, courage, or discipline to navigate their way out of their current (and worsening) condition.
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Need for professional external advice, management and decision support, and “new” productivity tools/solutions to thrive, if not survive. Focused on increasing institutional productivity.
Solution Based Opportunities

“He who will not apply new remedies must expect new evils; for time is the greatest innovator.” Sir Francis Bacon

New definition of the “American Research University”
Solution Based Opportunities

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New definition of the “American Research University”

✓ Less about place and size – more about being a force
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New definition of the “American Research University”

✓ Less about place and size – more about being a force
✓ Maximize the research and educational efficiency of the faculty
Solution Based Opportunities

Increase efficiency and effectiveness – productivity per faculty member has not changed and in some cases has declined. There has been some innovations in instruction, online classes, but little innovation for research (expect library). Approximately 40% of a research faculty member’s time is spent on administrative and compliance functions.
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- Individualized Information Access and Management Systems
- NSF – Required Data Management Plan
- Interdisciplinary / Cross-Institutional Collaborations
- Meta-analysis – “Automatic Bibliographies” – “Knowledge Genealogy”
- Opportunity Identification and Odds of Success Analysis
- PI Management (proposal and awards management)
- Lab Management Systems (Supplies, Chemicals, Lab Books)
- Compliance – Purchasing – HR
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New definition of the “American Research University”

- Less about place and size – more about being a force
- Maximize the research and educational efficiency of the faculty
- “Return on investment” based decisions and management
“Take Home” Points
1). American higher education has a history of incremental evolution; demographic, economic, social and political influences are the basis of the current and lasting revolution...“in every revolution there are winners and losers.”
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1). American higher education has a history of incremental evolution; demographic, economic, social and political influences are the basis of the current and lasting revolution...“in every revolution there are winners and losers.”

2). Acceleration of the differentiation, segmentation, and consolidation as well as greater competition driven innovation is redefining the “Great American University.”
3). Most universities are not well prepared to successfully undertake this transition by themselves. They understand the need for self-generated revenue, and they are interest in increasing efficiency and effectiveness (productivity). While game changing ideas are emerging but only a few universities have ability to execute (particularly related to research).
4). Increasing the *efficiency and effectiveness* of the primary “unit of production” (faculty) is the fundamental differentiator between universities that will thrive and those that will be marginalized or even fail in their research mission.
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Stay Tuned – More to Come
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Questions...
Comments...
Suggestions...