The Open Data Revolution in Higher Education

THE UNIVERSITY of TEXAS SYSTEM
Nine Universities. Six Health Institutions. Unlimited Possibilities.

Board of Regents' meeting
July 10, 2014

The pace and magnitude of technological change is staggering

The average washing machine today has more computing power than NASA used in its Apollo 11 mission in 1969

10 years ago, sequencing a human genome took $50 million and several years; today it takes < $10,000 and a few days

More text messages are sent each day than the population of the planet

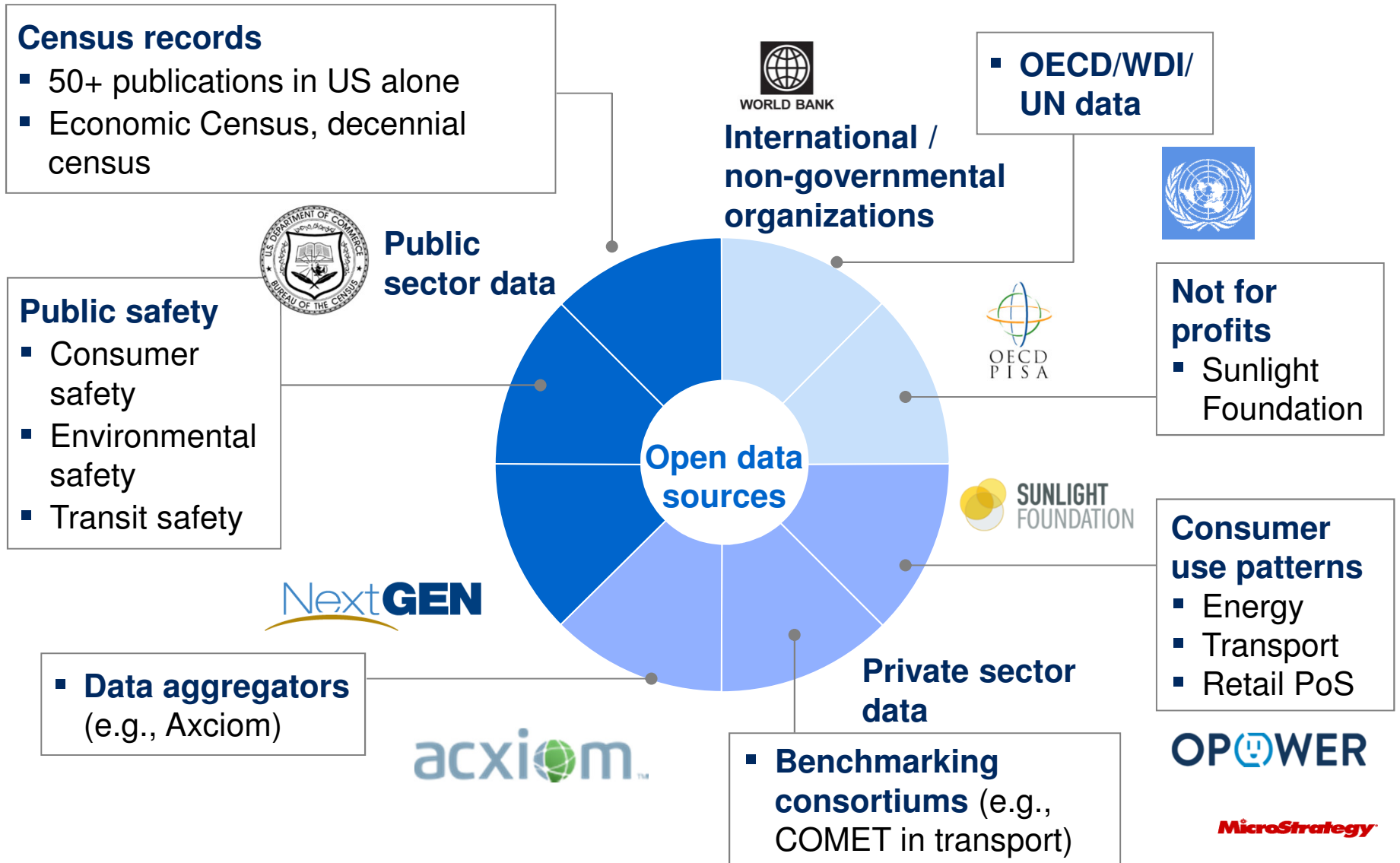**More information is created every 2 days** than from 0 AD-2003 AD

100 hours of video are uploaded every minute

35% of all photos taken are posted to Facebook

Data is everywhere

NGOs ☐ Private sector ☐ Government ☐

Census records
- 50+ publications in US alone
- Economic Census, decennial census

Public safety
- Consumer safety
- Environmental safety
- Transit safety

Public sector data

International / non-governmental organizations

- **OECD/WDI/ UN data**

Open data sources

Not for profits
- Sunlight Foundation

Data aggregators (e.g., Axiom)

Consumer use patterns
- Energy
- Transport
- Retail PoS

Private sector data

- **Benchmarking consortiums** (e.g., COMET in transport)

Data can be open or closed

	Completely open	Completely closed
Degree of access	Everyone has access	Access to data is to a subset of individuals or organizations
Machine readability	Available in formats that can be easily retrieved and processed by computers	Data in formats not easily retrieved and processed by computers
Cost	No cost to obtain	Offered only at a significant fee
Rights	Unlimited rights to reuse and redistribute data	Re-use, republishing, or distribution of data is forbidden

Open data is already changing how we live our lives

Public transit

- **10 billion public transit trips** in US each year
- Transit apps **save an average of 20% of passenger wait time** ($4 billion in productivity nationwide)
- **Aggregate data** helps authorities create efficient networks and allocate investment based on demand
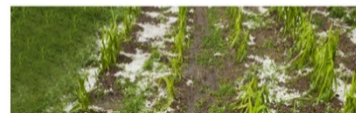

Crop insurance, agricultural finance

- **Climate Corp** was founded in 2006 to conduct analytics on **publicly available data** sources (USDA, USGS, etc.)
- Tool offers **improved crop insurance** products, futures/commodity market models, and enables evaluation of field experiments and agricultural productivity
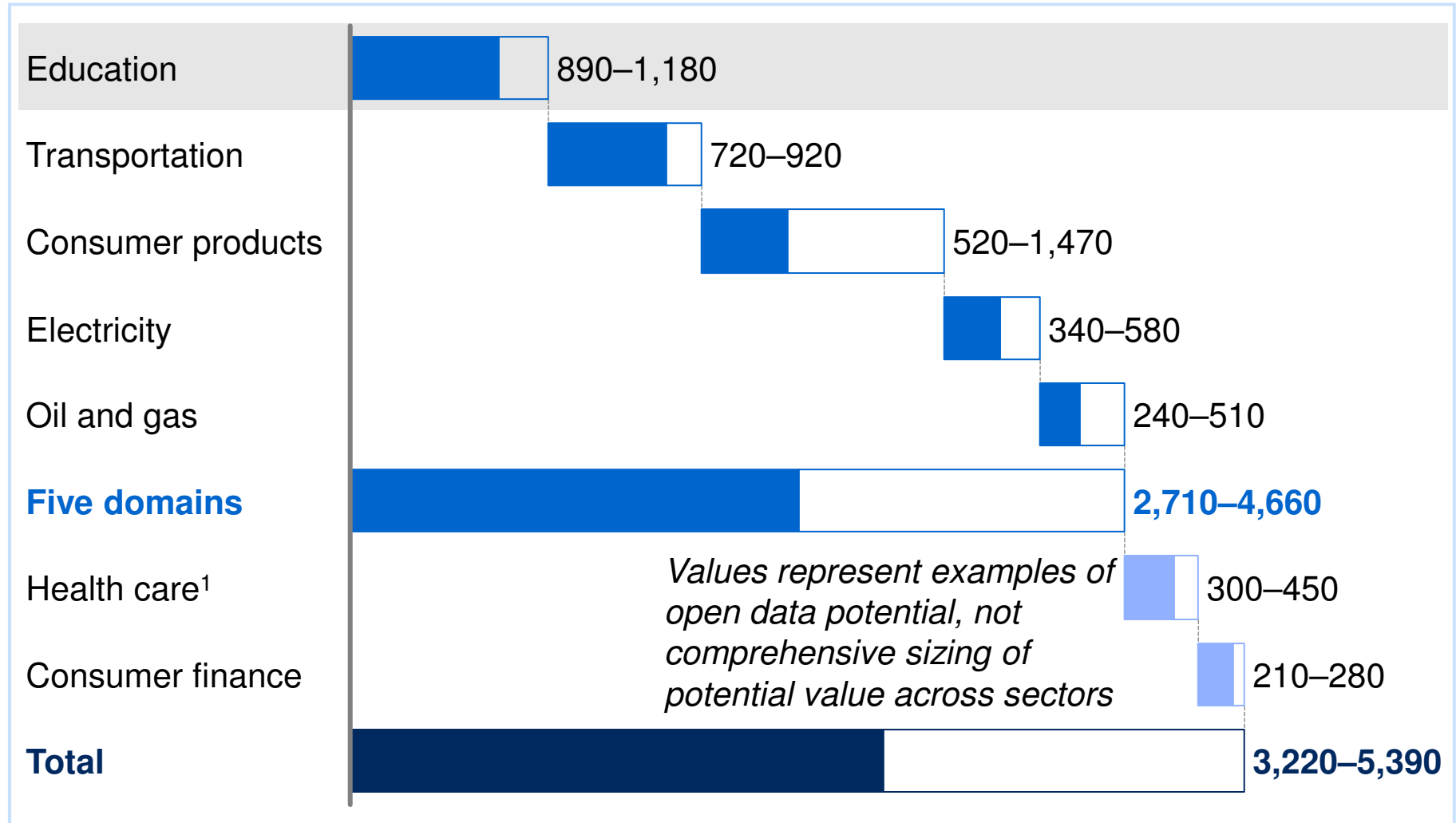
Open data can help unlock $3.2 trillion to $5.4 trillion in economic value

$ billion

Education	890–1,180
Transportation	720–920
Consumer products	520–1,470
Electricity	340–580
Oil and gas	240–510
Five domains	**2,710–4,660**
Health care[1]	300–450
Consumer finance	210–280
Total	**3,220–5,390**

Values represent examples of open data potential, not comprehensive sizing of potential value across sectors

1 Includes US values only.
NOTE: Numbers may not sum due to rounding.

Five ways in which open data will change the face of higher education

Improved instruction

- Personalized learning
- Frequent feedback and training for teachers
- Student-teacher matching

Matching students to programs

- Benchmarking of educational value
- Transparency of programs
- Transparency of skills demanded by employers

Matching students to employment

- Enhanced employer-candidate matching
- Clearer signaling of candidate skills

Transparent education financing

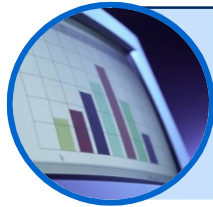- Loan transparency
- Personalized net price comparisons

Efficient system administration

- Enhanced procurement and shared purchasing programs
- Data-driven siting strategy

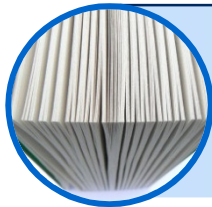# What could this look like at UT?

Data that exists now ➤ **Application that could exist tomorrow**

Real-time course enrollment data, linked to student demographic data

➤ "Hot courses right now…"
"Students like you are taking…"

Full text of NIH grant applications from across UT

➤ "Applications like yours have an X% chance of being funded; to increase this you could do Y & Z…"

Consumption patterns for online and hybrid courses, linked to assessments

➤ "Dear Professor …"

Alumni switching jobs (from social networks)

➤ "Have you considered a UT *[insert relevant lifelong learning opportunity]* ?"

Purchase orders from all procurements across UT

➤ "You paid X, but you could have saved Y"

Three ingredients

Vision

- What is the problem?
- Who can we help?
- What concerns must we account for?
- How do we evaluate the effort?
- Where do we deploy the approach first?

Data

- Demographic
- Economic
- Academic
- University system

Technology, capabilities

- Data security
- Easy to locate data
- Data management
- Analytics, user experience, and app development skills
- Relationships with 3rd party data vendors
- Stakeholder engagement

Questions?