INDUSTRIAL COOPERATION PROJECT

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BACKGROUND

- The Wealth of Networks began the task of looking at various "verticals" that have a major impact on development, like educational materials, biological innovation around both health and food, and software and information technology, and outlined then-present practices aimed at provisioning these goods on commons-based models.

- The study began partly by taking that approach and mapping presently-practiced commons-based production into verticals.

- In addition to searching in development-related verticals, the study also sought to identify commons-based practices that reflect different types cooperative production.

FOUNDATIONAL QUESTIONS

- How (and if) are components of the industrial structure changing in how they deal with and manage knowledge embedded assets, in different industries, different business models, and different sets of actors?

- How (and if) are they incorporating commons based strategy?

- Crucial to understand to what extent and how the Intellectual Property System affects cooperation in different sectors.

    - As Benkler wrote: "If some information producers do not need to capture the economic benefits of their particular information outputs, or if some businesses can capture the economic value of their information production by means other than exclusive control over their products, then the justification for regulating access by granting copyrights or patents is weakened".

KNOWLEDGE EMBEDDED PRODUCTS

- data
- text
- tools (and their composites)

AGENDA

- Results
- Relevance
- Research methodology
- Verticals
- Conclusions

KEY TAKE AWAY

the nature of the knowledge embedded product has an impact on the emergence of commons-based production

RELEVANCE

if you care about the emergence of CBP (or a knowledge governance system which allows broader access to knowledge) in some sectors, you may have to have some kind of intervention in the market…and not wait for organic emergence of CBP.

RESEARCH METHODOLOGY

- The methodological approach of the ICP is well known and understood: the industry case study. The primary challenge here was to create a conceptual map that would allow us to:
  - (a) standardize observations across sectors;
  - (b) represent conceptually and visually the relevant attributes of players in each sector, and their changes over time, if any; and
  - (c) identify whether industry practices have shifted toward more or less cooperative frameworks over time.

OUTPUTS

- There are two outputs to the project.
  - #1: The ICP Synthesis - the synthesis of the research - which pulls together the high-level results, examines some trends identified by the research, and identifies questions for additional research. Parts of the research also will be available through a series of working papers and essays.
  - # 2: The second is the ICP Wiki itself - rather than pursue a more traditional path of data collection into a private archive, we collected the vast majority of our work into this public commons.

ICP WIKI

- The wiki is the collective memory of the project. It is where we kept notes, where reading was summarized, where hypotheses were examined and evaluated.
  - As such, it is a rich resource for **future work but it is not a polished resource.**
  - We hope that future researchers not only mine the wiki but improve it through cross-linking, editing, adding citations, translating text into other languages, and more.
- Using the wiki for this purpose was part of the experiment of the research, to try novel methods for research collaboration as we examined industrial collaboration.

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Main Page

Welcome to the Industrial Cooperation Project Wiki!

Introduction

Despite the growing popular and academic recognition of the importance of commons-based, cooperative, and peer production, there is still relatively little sustained academic work that studies both the scope and micro-foundations of these phenomena. Together, the rise of commons-based collaboration and production encompasses a class of innovative and creative practices whose outputs could be freely available to support human development in a global, networked information economy and society.

The study was conceived to extend the work initially outlined in Wealth of Networks - which is currently being pursued as part of the Berkman Center's Cooperation Project - to provide a map of commons-based production and cooperative peer production today. The initial task proposed was to look systematically at a wide range of information and knowledge production sectors, to identify commons-based and peer production practices, list them, describe them, and categorize them.

The Wealth of Networks began the task of looking at various "verticals" or industry sectors that had a major impact on development, like educational materials, biological innovation around both health and food, and software and information technology, and outlined then-present practices aimed at provisioning these goods on commons-based models. The study began partly by taking that approach and mapping presently-practiced commons-based production into these verticals. The practices were not limited directly to development, because the objective is to learn about the range of feasible practices, rather than to identify direct inputs to development today.

In addition to searching in development-related verticals, the study also sought to identify commons-based and peer-production practices that reflect different types cooperative production. There is at present very little serious work on mapping and categorizing the wide range of practices of cooperation, peer production, and large-scale coordinate productive behavior observed. One aspect of the study required the creation of the first elements of such an intellectual mapping.

Finally, the project explored the construction of an experimental, web-based platform for enabling participants in, and observers of, collaborative and commons-based practices to describe their own experiences and communities, and to comment on and annotate the descriptions of others.

Outputs of the ICP

There are two outputs to the project. One is the synthesis of the research - the ICP Synthesis - , which pulls together the high-level results, examines some trends identified by the research, and identifies questions for additional research. We created a broad map of cooperation across the fields of educational materials, biotechnology, alternative energy, and telecommunications, and we found some interesting preliminary trends about commons-based production and industrial cooperation that emerge in and across those fields. The canonical version of this synthesis is found on the Industrial Cooperation Wiki - ICP Wiki

The second is the wiki itself - rather than pursue a more traditional path of data collection into a private archive, we collected the vast majority of our work into this public commons. The wiki is the collective memory of the project. It is where the research assistants and fellows kept their notes, where reading was summarized, where hypotheses were examined and evaluated (and often discarded). As such, it is a rich resource for future work but it is not a polished resource. We hope that future researchers not only mine the wiki but improve it through cross-linking, editing, adding citations, translating text into other languages, and more. Using the wiki for this purpose was part of the experiment of the research, to try novel methods for research collaboration as we examined industrial collaboration. The ICP Wiki also hosts the ICP Parking Lot for fascinating ideas that emerged but could not be studied in depth.

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Working Papers, Essays and Presentations

Alternative Energy

- Alternative Energy Paper
- AE Essay on EFRC Survey
- Essay: The Political Economy of Intellectual Property in the Emerging Alternative Energy Market

Biotechnology - Genomic and Proteomics

Genomics

- **Genomic Knowledge Governance**
  - **Paper:** An Interoperability Principle for Knowledge Creation and Governance
  - By: Carolina Rossini and John Wilbanks
  - Presented at *MINDS conference on Strategic Responses to Globalization*, held from 3 November 2009 to 6 November 2009, in Rio de Janeiro, Brazil. The second version was presented at the *II International Intellectual Property Conference of Portuguese Speaking Countries*, from 25 to 27, February, 2010, in Lisbon, Portugal.
- **Sage Bionetworks**
  - Sage - A Merck Project
  - Sage International Data Commons Working-Group on international Genomics Knowledge Governance.
    - Carolina Rossini is coordinating the internationalization efforts of Sage Bionetworks in cooperation with Science Commons and Sage

Diagnostic Kits

- DK Essay
- Case Law Review
- Literature Review
- Country Reports Review
- USA Regulation Review

Educational Materials

- Educational Materials Paper
- A Brief Overview of U.S. Public Policy on OER from California's Community Colleges to the Obama Administration

Telecommunications

- Telecommunications Paper

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ICP Parking Lot

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Introduction

The ICP was an ambitious project. We set out to map very different sectors, and different kinds of knowledge products inside those sectors, with a small team. We encountered many interesting opportunities, questions, hypotheses, fields of study, and research leads that we simply could not follow in the project lifespan. We have collected them here in the Parking Lot so that others can see what we saw, build upon and research further, and make new connections. There is an enormous amount of activity in the ICP Sectors that will change some of the data in the wiki, and we hope to see activity here feed into the wiki as current events catch up to the research.

Parking Lot Contents

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VERTICALS

VERTICALS

- Biotechnology, Alternative Energy, and Educational Materials
  - These three verticals represent a strong cross-section of the contemporary economy.
  - As such, they provide a powerful lens to examine case studies and begin to develop theories about how, when, where, and why commons-based approaches develop, succeed, or fail in practice.

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Alternative Energy

Field definition

Basic Definition

"According to New Energy Finance, the clean energy sector grew to over $148 billion in 2007, up forty-one percent from 2006 despite the last summer's credit crunch."(Ward et all, 2008)

Alternative energy technologies produce energy while causing less environmental damage than traditional means of energy production like the fossil fuels, coal, oil, and natural gas. Alternative energy technologies are also referred to as clean technology (Cleantech) or renewable energy technology. Alternative energies are an array of distinct technologies, services, and products that are designed to reduced greenhouse gas emissions while promoting efficient energy use and the conservation of natural resources. These technologies vary immensely in type, innovation cycles, maturity and technoeconomic readiness. They can also be divided into energy supply and energy end-use innovations. Energy supply technologies are those that produce energy for use by consumers, while energy end-use technologies are those that promote efficient use of that energy. Alternative energy supply technologies include wind, solar, geothermal, biomass, biofuels, tidal, wave & ocean energy, nuclear, hydropower, fuel cells, clean coal, and certain types of high-efficiency, low emissions combined cycle natural gas turbines. Energy end-use technologies include energy efficient lightbulbs, home appliances, and fuel efficient, hybrid, or plug-in automobiles. Our research is focused on three energy supply technologies, solar, wind, and tidal/wave.

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  - 3.2.2 Bibliography by Resource Type
- 3.3 Survey with EFRCs

4 Possible Special Case Studies in AE

5 Spring Conference

ALTERNATIVE ENERGY

- wind, solar, sea
  - different levels of maturity
  - no evidence of commons based production
  - high level of patenting
  - complicated manufacturing systems
  - complicated knowledge governance processes

ALTERNATIVE ENERGY

- literature review reveals no proof of blockages from patents
- survey indicates traditional knowledge product governance (EFRCs survey: papers and patents) and efforts to foster a closer relation between universities and companies (prizes, clusters, etc)
- sharing happening in pre-product spaces: OpenEi (to share smart grid data in a manner consistent with the US data.gov system), U.S. OpenLabs, and the Database of State Incentives for Renewables and Energy (DSIRE)
- emergence of community of users in the spirit of “do it yourself”
- interesting case of Denmark’s offshore wind industry

Energy Information, Data, and other Resources

Siemens

Siemens, a global leader in renewable energy, is expanding into new markets in Russia and the United States.

Follow OpenEI on:

Information Gateways

- U.S. OpenLabs
- International Clean Energy Analysis
- Clean Energy Economy
- Smart Grid
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Educational Materials

Field Definition

Basic Definition

The field of educational materials (EM) refers to a subset of the book, games, Internet, and software publishing industries that is focused on providing resources to a variety of educational market segments. For instance, PricewaterhouseCoopers characterizes the EM sector as divided into digital and non-digital solutions (Cola, et al. 2009). At the K-12 educational level, digital solutions include a range of technologies used to enhance the delivery and the administration of K-12 education, including data management systems, web-based course and assessment materials, and online tutoring and professional development—however, we will only focus on those digital solutions products that have specific educational purposes and where knowledge is embedded in a form that can be enclosed by some form of intellectual property. Regarding non-digital solutions, we include textbooks, course packs and other supplementary materials, and various educative toys and games.

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3 EM Essay

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- 5.3 Interviews and Notes
- 5.4 Blogs to watch on EM
- 5.5 Contacts for EM

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EDUCATIONAL MATERIALS

- textbooks, courseware, etc. at k-12/college
  - significant evidence of commons-based production: OER
  - incumbents and start-ups exploring new (open/closed) models
    - “open business models”: self-publishing, advertisement based, printing-on-demand (including for public domain)
    - closed: locking clients with services - content is a commodity
- and of course we see: publishers suing users and institutions and problem of access due to price still central

- Towards “openness”:
  - Obama “wants” to invest in OER
  - a perceived huge barrier has fallen: textbook adoption process now accepts open textbooks
    - CA and TX drive the country
    - what about the rest of the world? .... governmental interventions (e.g.: Brazil)

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A Brief Overview of U.S. Public Policy on OER from California's Community Colleges to the Obama Administration

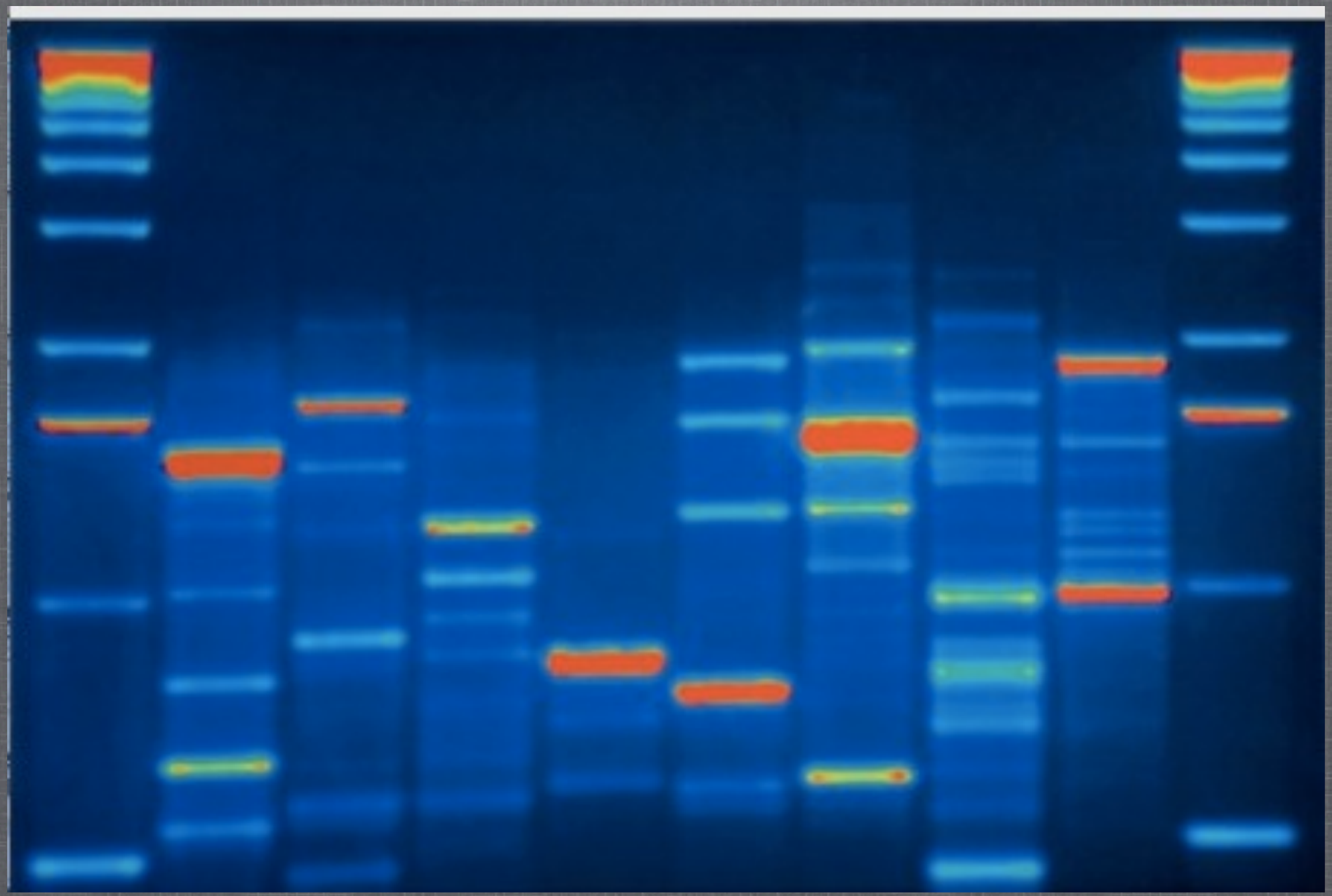
*Essay by **Carolina Rossini, Erhardt Graeff**, October 8, 2009*

*This post draws significantly from an interview on August 10, 2009 with **Hal Plotkin**, a Senior Advisor at the U.S. Dept. of Education, who has closely followed and been involved with OER policies in California. The interview was part of research on the educational materials sector being conducted under the **Industrial Cooperation Project** at the **Berkman Center at Harvard University**. The research is part of a broader project being led by Prof. Yochai Benkler and coordinated by Carolina Rossini. In the research, we are seeking to understand the approaches to innovation in some industrial sectors, such as alternative energy, educational materials, and biotechnology. The intention is to map the degree to which open and commons-based practices are being used compared to proprietary approaches and what forces drive the adoption and development of these models.*

Towards “closedness”

- “**Pearson's Core Strategy: TESTING (a.k.a the New S-Curve)**

  - Connected to For-profit Model of Education: **All curriculum is prescribed, scale is possible**
  - Journey is not as valid if you can't validate the learning
  - Pearson has spent almost all of its money on assessment systems
    - My Math Lab (killer app)
    - End of chapter homework is out of the textbook, all practice is online
    - Homework and everything assigned starts at the technology
    - If assignment is required, then every student pays for the service
    - When they buy a used book, they still need to go to Pearson and buy the access code (still get the money)
      - More willing to drop price of overall package: textbook, online service because everyone is paying
      - Textbooks become just a commodity *component*”



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Biotechnology - Genomic and Proteomics

Field definition

Basic Definition

Simply defined, biotechnology is any technology that relies on living organisms or biological systems. By this definition, human beings have been using biotechnology for thousands of years to produce food products, textiles and other necessary items. Several familiar items -- including yeast-rising bread, yogurt, cheese, wine, beer and

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many drugs are now developed using biotechnology. The

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Introduction to Genetic and Genomic Diagnostics

The field of Biotechnology is a critical US industry, by some estimates approaching 2% of the US GPD and growing 15% per year. Genetic and Genomic research represent a core focus of R&D in the biotechnology industry. Over the last 40 years, improvements in sequencing technology have led to massive increases in test precision and overall throughput capacity. These advances have bolstered the breadth of genetic and genomic research, and have allowed these fields to transcend from mere laboratory concepts to a number of practical, real world applications.

Today, these research efforts have contributed clinical diagnostic methods of testing that are capable of providing information specific to the genetic characteristics of an individual. The logical core of diagnostics is the link between a health state, such as a disease or drug response, and particular genetic sequence

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2 Defining Genetics and Genomics
- 2.1 Understanding Genetic and Genomic Diagnostic Distinctions

3 Types of Diagnostics Tests
- 3.1 Testing Methods

4 Clinical Diagnostics Testing
- 4.1 Application of Test Results
- 4.2 How Clinical Tests are Marketed

5 Who Offers Genetic and Genomic Tests?
- 5.1 Market Participants in Personal Genomics
  - 5.1.1 Sequencer Manufacturers
  - 5.1.2 Full Genome Sequencing providers
  - 5.1.3 Recreational and Clinical Genomic diagnostics
  - 5.1.4 Reference labs

6 Legal Aspects of Diagnostics
- 6.1 Case Law Review
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7 Study of the field

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- 8.1 Research Vocabulary
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BIOTECH

- A mixture of commons-based production and more traditional, closed practices depending on the point in the value chain where we looked.
  - "Big science" projects show the most evidence of commons-based effects on industry.
    - The commons in gene sequences also sparked the emergence of commons-based production in functional genome annotation.
    - Most big science happens through government investment in university and its outputs in the data and text products are now open by default (due to the Bermuda Rules and the NIH Public Access Policy)
- No significant evidence of commons-based industrial disruption in biological materials (research tools) although the Personal Genome Project and the efforts of private foundations investing in disease-specific research as well as a new set of technology transfer "principles" for licensing may create the conditions for such disruption in coming years.

BIOTECH

- A mixture of commons-based production and more traditional, closed practices depending on the point in the value chain where we looked.

  - "Translational research": province of biotechnology startups funded by VC and high value on patents and trade secrets

  - There are attempts to create "open source drug discovery" as seen in India, but most of those successes are actually more similar to big science - genotyping organisms versus identifying potential drug targets or potential drug interventions.

BIOTECH

- The end products market has been the most resistant to commons-based effects.
  - Drugs, diagnostic kits, vaccines, and other products that are actually marketed to people exist under a strong regulatory regime that provides very high costs to entrants.
  - Patents are aggressively used to enforce monopolies on products worldwide, creating artificial scarcity and dramatically affecting quality of life.
  - In some cases there is conflict from the early stages of big science, or from the advance of technologies related to big science, with the products and patents - for example, it is easy now to get a genomic profile from a company like 23andme, which is cheap because of the Moore's Law-like increases in genomic sequences and decreases in costs driven by big science. But if a woman were to ask for the profile to tell her if she had the genetic mutation for cancer, that would conflict with the Myriad Genetics patent on diagnosing the mutation, which is in the end products

SUMMARY

CROSS SECTOR SUMMARY

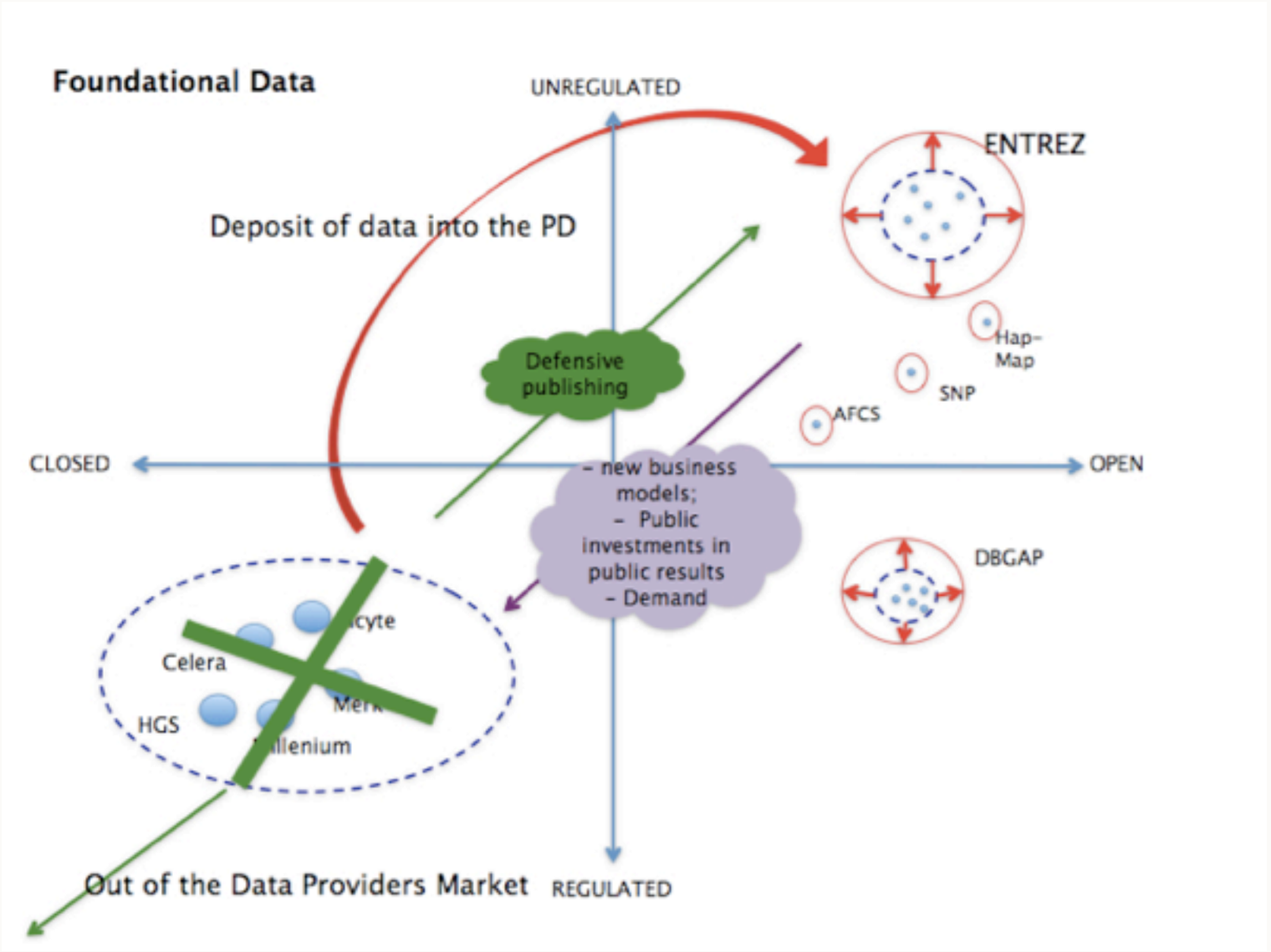
- **Biotechnology sector:** well developed **variability in practices,** with some of the **most proprietary** alongside some of the **most open and collaborative efforts**.

- **Alternative energy:** Here, the **practices are less well developed**, there is no real structure for commons-based practices, but there is substantial and interesting support from the current United States Department of Energy to embrace innovation-sharing practices as part of the global effort to address climate change and sustainability.

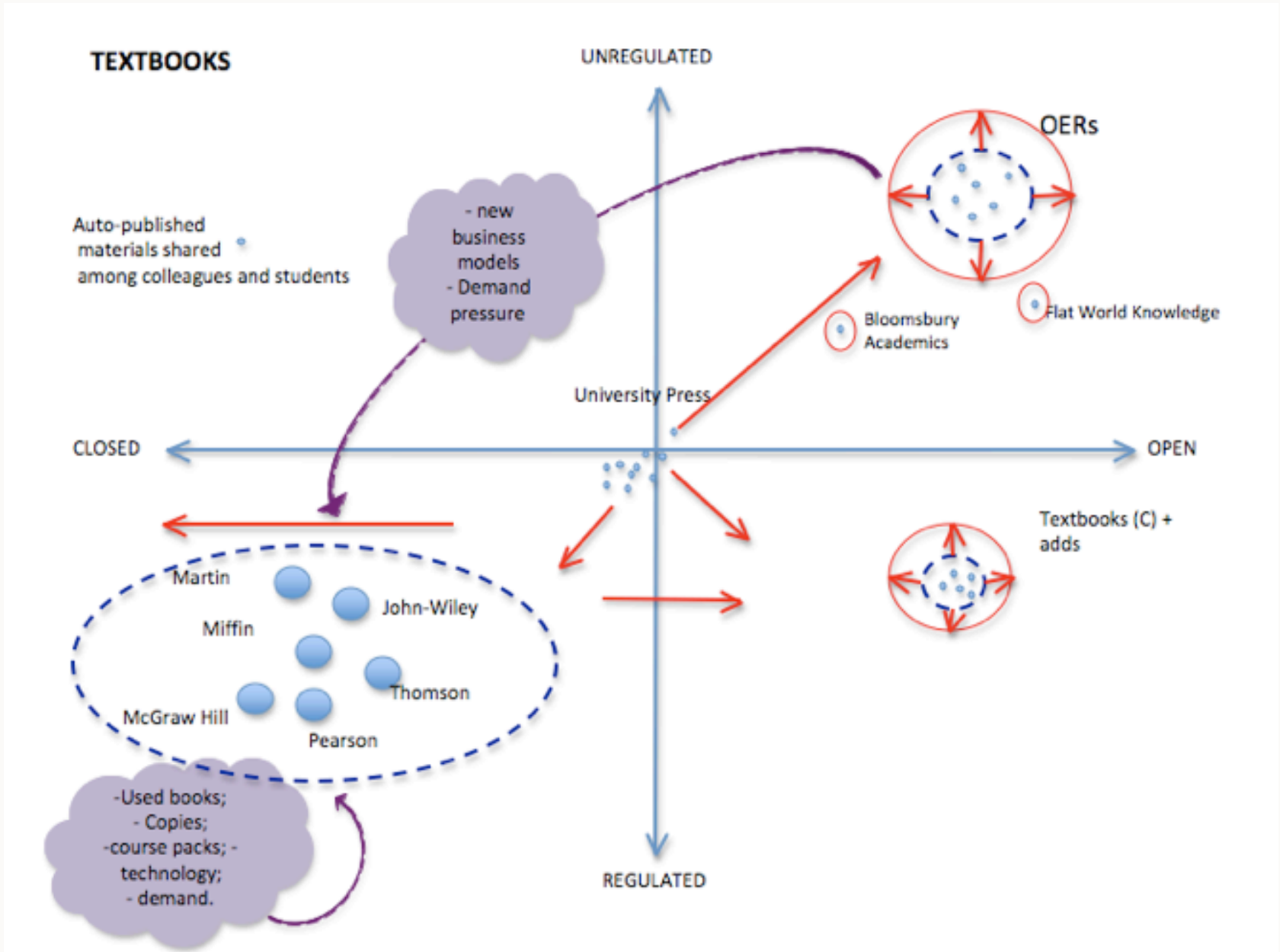
- **Educational materials**: is **intermediate** in the development of commons- based practices, counting large and historically **powerful incumbents, and cultural barriers** regarding incentives to cause changes.

INTERVENTIONS

GOVERNMENT INTERVENTION



GOVERNMENT INTERVENTION



INDUSTRY BEHAVIOR INTERVENTION

Denmark's offshore wind industry

- Need of *knowledge economies* - communities spanning across organizational borders, where knowledge is continuously embedded in practice - in order to foster the new industry of off-shore wind. In this case, the innovation became much more "team oriented" than company owned;

- Need for solving specific problems no one could solve alone;

- Need for testing new concepts which could be too risky to be tested alone, but whose solution would benefit the industry as a whole;

CONCLUSIONS

KNOWLEDGE GOVERNANCE

- commons-based production is easily findable within copyright-based industries, such as software and educational material

- industries with more complex manufacturing and distribution requirements have higher resistance to commons-based cooperation

KNOWLEDGE GOVERNANCE

- even complex manufactured knowledge embedded products have cycles inside which commons-based production may having an impact
- however, the focus here maybe more on the need of models for knowledge diffusion than innovation (access to scientific progress, access to know how, tech transfer, etc)

KEY TAKE AWAY

the nature of the knowledge embedded product has an impact on the emergence of commons-based production

RELEVANCE

if you care about the emergence of CBP (or a knowledge governance system which allows broader access to knowledge) in some sectors, you may have to have some kind of intervention in the market…and not wait for organic emergence of CBP.

THANK YOU!

AND THANKS TO YOCHAI BENKLER, THE BERKMAN CENTER AND THE FORD FOUNDATION

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