Engineering Research Partnerships for the New Decade

Facilitating University-Industry Partnerships

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Situation Dynamics

Vicious Cycle

- IP-centric
- It takes too much time, effort, money to negotiate agreements
- Perceived deterioration of trust and goodwill, adversely affecting long-term partnerships & collaborations
- Increased flow of sponsored research funds to other parts of the world
- At the working level, people just walk away

Virtuous Cycle

- Relationship-centric
- Trust-enhancing
- Builds on each other’s work
- Attracts increasing financial support
- Motivates increasing commitment and contribution of the current contributors
- Attracts increasing involvement of other organizations
Models Underlying Sponsored Research

...understanding the patterns of experience and what happens in execution...

Sponsored Research

"No-IP" or "No Contract"
- early stage work
- collaborative in nature
- preference for publication
- put in public domain
- discussions around exchange of ideas & information
- focus on students
- both partners willing to contribute to each other's well-being

"IP" or "Contract-based"
- later stage work
- contentious in nature
- discussions around idea ownership, rights
- negotiations around patents, licenses, royalties, exclusives
- focus on things, ownership of other issues came into play such as risk, indemnification

"Can't Agree" "Continue Negotiating"
- time passes (months, years)
- neither side wants to accept "no path forward"
- no escalation path for dealing with impasses
- usually no hard deadline by which an agreement must be in place

Labels:
- Proxies for 2 different operating models

Terms & Conditions
- Access & use
- Ability to commercialize
- Blocking Positions
- Royalties & Exclusives
- Revenue, $ Other meaty issues...

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The Next Wave of Innovation …

*Innovation is Disintermediating!*

- Form and structure of innovation is changing.
- Ways that we innovate, both individually and collectively, are changing (assumptions, values, interconnectedness)
- Environment and habitat in which we innovate are different
Partnership Models
Partnership Models

- 1-Element ("go it alone")
- 2-Element: Industry-University
- 3-Element: Industry-University-Government
  - Sabato’s Triangle
- MegaCommunities
Model Evolution

• Over time, the higher-impact models have evolved from
  – 1-element (go-it-alone),
  – to 2-element partnerships,
  – and more recently to 3-element partnerships,
  – and finally Megacommunities
Vertically-Integrated Value Chains

- Closed value-delivery systems (VDS)
- Example: IBM in the early 70’s
- “Go it alone” or, “Do everything yourself” philosophy
- Little visibility to competencies “inside” the single VDS
- Competitive at the “ends” of the model (Research, and Customer Delivery)
- Essentially, a “black box” model, where something wonderful comes out at the end
- Middle notes in VDS remain hidden from view, not exposed to competition, and relatively unoptimized

Circa: 70’s, 80’s for ICTs
Partnered, Value Networks

- Beginning of transparent value-delivery systems (VDS)
- Examples: Raytheon, defense subcontractors
- Some outsourcing is taking place, along with selective insourcing and partnering (non-competitive)
- Partners are still discouraged from working with competitors
- Model is competitive at the “ends” (Research, and Customer Delivery), and co-operative in the middle
- Distinctive competencies begin to emerge
- Business leaders seek to gain leverage on the competencies they choose to keep “in-house”
The Emergence of Ecosystems
... the Beginning of “Open”

- Optimization around distinctive (core) competencies
- Examples: Boeing, HP, Autodesk, nVIDIA
- Lines between “competitors” and “partners” begin to blur
- All forms of cooperation are entertained
- Model is both co-operative and competitive at each node in the VDS (“co-opetition”)
- Disintermediation becomes the norm; spin-offs are common
- Costs are driven down, efficiencies are gained, and the end-users and customers benefit significantly from increased contribution at much lower cost
- Model decisions are managed and optimized on the 1st derivative – how things evolve and change over time (vs. static position, competitive position of today)
“Open” Value-Net based Ecosystems

- Highly networked, multi-output, multi-stakeholder model
- Examples: Individual entrepreneurs, Olin student
- “Open Standards” enable rapid evolution, and intense competition
- New value nodes are created and destroyed easily and frequently
- World-class competencies are needed, in order to survive
- One company’s deficiency becomes another company’s opportunity
- Cross-discipline, cross-industry contributions are the norm
- Cross-geography, cross-cultural “localizations” are the norm
- Economies of scale are present, that are simply not possible in other models
The Knowledge Process of the Future

Knowledge Generation

- New Knowledge
- To Satisfy Society

Knowledge Transfer

- Competence & Ability to Learn

Academia

- Faculty
- New Talent
- Curriculum
- Stakeholder Needs
- Talent Specification
- Industrial Teacher

Industry

- Joint Research
- Customer Solutions
- New Knowledge
- Knowledge Application
- Best Practices
- Customer Needs
- Customer Feedback

- Integrated Enterprises
- Integrated Product/Process Dev
- Learning Organizations
- Enterprise-Wide Supply Chains

Creating the Next Innovation Ecosystem

Think Globally, Act Locally

Think Locally, Act Globally

One Model: Structural Approach for Addressing Primary HP Interests related to Universities

Higher Education Globally

HP Business Interests

HP Technology Interests

sales opportunities/outcomes * business/technical talent * intellectual exchange/property

• Deal-closing investments
• Leadership contributions

GBUs
• Field $
• Region $?

HP Foundation
• Cognitive science, ergonomics etc $?

P&E Initiatives
• Early-adopter / innovator communities
• Structured grant-making
• Directed donations

UR + P&E
• Pen computing $
• REG, SW etc $?

UR Initiatives
• Outreach, donations $
• NGDC, DSpace etc $?

HPL + GBUs
• LD portfolio $
• CTO project $?

University Business & Technology Engagement Council

data sharing - budget alignment - funnel management - outcomes assessment

Composition: PSG, IPG, TSG, HPL, UR, P&E

Stakeholders: HR, CSER, GPA, HP Education
Advisory: OST Finance, Global Alliances, Corp Development

Characteristics of a good partnership

- Recognize that there are other players at the table
- Partnerships are open and collaborative in nature and the partners are open to working with other people
- Don’t have a winner-take-all attitude (win-lose)
- What we strive for is that everyone gets something (win-win-win) – different partners get different things (some of these things may be proprietary, but not everything)
- When you have an open collaboration, multiple people pursue multiple things in parallel (vs. serial models of tech transfer where things happen at the end and are obsolete) → acceleration
- Open collaboration provides relevance – multiple people get to shape things at the beginning of the collaboration based on application knowledge
Partners Invest Together in an Ecosystem Environment

- Cost sharing is the most important driver in creating alignment between the private sector and university research ("skin in the game")
  - The in-kind discussion is especially relevant to the IT industry and most of the major corporation make extensive use of this approach in their strategic partnering, esp. software (MSFT, et al).
- Cost sharing is also the most important driver in determining whether the outcomes are meaningful
- Competition requires an ecosystem, not a point-source contribution (see John Kao’s book “Innovation Nation: How America is Losing Its Innovation Edge, Why It Matters, and What We Can Do to Get It Back”)
- Ecosystems provide self-reinforcing (amplifying) and virtuous cycles
- Ecosystems are alive and well in Brazil, Russia, India, China, etc.
  - The difference is that everyone (Government, Private Sector, Universities) is on the same page (greater alignment than the US system; we have work to do here)
What’s Working?

- Certain Geographic Areas (Clustering theories)
- Open Innovation Models
- More Collaborative Networking
- Business Engagement Centers (Michigan)
- Corporate Research Labs-Universities “like-to-like”
- Functional Industry Integration Offices
- Federal Government Research Funding (although it appears to be “headed over a cliff”)
What’s Not Working?

• Not Enough or Dysfunctional Information Flow
• Ad Hoc Partnership Approaches
• Intellectual Property Transactions
• Venture Capital — feast or famine
• Private Sector Research Cutbacks & myopic “Wall Street” focus on next 5 minutes
• Inadequate State Funding for Universities
• Understanding Cultural Differences
• Government funding cycles out of sync with business realities “on/off” doesn’t cut it
ASTRA Industry Innovation Alliance

• Inaugural Workshop on Industry Innovation on April 26
• 25+ invited participants from Industry only

FOCUS / DESIRED OUTPUTS

• The current amount and mix of R&D investments in the U.S. economy;
• The types of R&D needed to maintain U.S. competitiveness and innovation ecosystems; and
• The efficiency of R&D investments within the industry environment
Thoughts about The Future

• Knowledge Exchange Involves Business & Universities Working Closely Together
• The Old Paradigm of Fundamental Research Moving to Applied Needs Rethinking
• New Metrics are Needed to Encourage Knowledge Exchange and Open Innovation
• Building Trust and Mutual Understanding Really Matters and Takes Time
• Capacity and Capability of Both Industry and Universities to Interact is Critical to Developing Knowledge Transfer Strategies
Summary

• Closed systems produce things that are obsolete and will not be competitive going forward – open collaboration is the paradigm of choice for accelerating innovation

• Good partnerships are holistic, open, collaborative (win-win-win)

• US competitiveness – only way we will be competitive is if we collaborate and innovate openly

• There are other innovation ecosystems out there that are alive and well and prospering

• Commitment to education globally – everyone who invests in education globally will win
Thank You

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