Innovation Policy Challenges in a Networked World

- User, open, and collaborative innovation is in tension with the standard IP paradigm
  - User innovation is prevalent in developing countries, especially based on network technology
    - E.g. Mobile phone/financial service innovation, small businesses
  - These paradigms usually rely on low or no formal IP
    - Challenge assumption that more protection is socially beneficial or even beneficial to US interests

- Data-driven innovation, privacy and discriminatory impact
IP: Costs and Benefits

• **Benefits:**
  – motivate invention by deterring “free riding”
  – motivate disclosure rather than secrecy
  – motivate dissemination through sales and licensing

• **Costs:**
  – higher prices (deadweight losses)
  – downstream innovation “taxed” or precluded
  – transaction costs of bargaining, licensing, defining IP boundaries, litigation, etc.

• **Underlying Assumptions:**
  – Innovators must be compensated monetarily via sales
  – Innovators are completely competitive
  – Transaction costs are not too high
  – Market demand induces the “right” innovations
User, Open, and Collaborative Innovation: Where IP's Assumptions Break Down

• Innovators may have non-monetary incentives including
  – Enjoyment of creative process, sociality, altruism

• Alternatives to sales-based compensation including
  – Use, reputation, complementary business models

• Innovators may have common interests in
  • Non-monetary benefits, infrastructure, advancing or establishing a field or market

• IP transaction costs may be high due to
  • Notice problems, overlapping claims, cumulativeness, no valuation metric, one-size-fits-all legal standards

• Market demand may not induce the “right” innovations
  – Consumption externalities, inability to pay, myopia
<table>
<thead>
<tr>
<th>Non-monetary incentives</th>
<th>Biological Research Consortium, OSS</th>
<th>Blast Furnaces and Steel mills (1800s)</th>
<th>French chefs</th>
<th>Doctors (medical procedures)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health, Curiosity</td>
<td>Use</td>
<td>Artistic fulfillment</td>
<td>Use, Patient health</td>
<td></td>
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<tr>
<td>Alternative Compensation mechanism</td>
<td>Reputation, public funding</td>
<td>Complementary business model</td>
<td>Reputation</td>
<td>Complementary business model, reputation</td>
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<tr>
<td>Scientific knowledge</td>
<td>Cheap infrastructure</td>
<td>Compete with old technology</td>
<td>Tailored norms</td>
<td>Patient health</td>
</tr>
<tr>
<td>Demand failure</td>
<td>Yes</td>
<td></td>
<td>Sometimes</td>
<td></td>
</tr>
<tr>
<td>Transaction costs</td>
<td>Cumulative</td>
<td>Cumulative</td>
<td>Hard to detect</td>
<td>Cumulative, hard to detect</td>
</tr>
</tbody>
</table>
OC Innovation Is Not Magic

- **Governance**
  - Norm setting and enforcement
  - Rewards (e.g. reputation)
  - Rules or norms of membership and access

- **Infrastructure to reduce costs of sharing and collaboration**
  - Databases
  - Meetings
  - Biorepositories
  - Standards for compatibility
  - Journals

- **Possible policy response?**
  - Subsidize or mandate governance and/or infrastructure
IP Can Destabilize OC Innovation

- IP may undermine OC governance
  - “Insiders” may use IP to defect
  - “Outsiders” may free ride on openly available innovation by staking out IP claims
    - Issue for public-private partnerships?

- IP can increase transaction costs of OC regimes

- IP doctrine helps delineate “pre-competitive” and competitive innovation
  - International differences in IP doctrine may complicate global OC innovation regimes
  - Converging to strong IP may undermine OC regimes

- Possible policy responses (TRIPS?):
  - Infringement exemptions (“fair use”)
  - Patentable subject matter exclusions
  - Remedies variation
Data-Driven Innovation: Panacea or Hype?

- **What data?**
  - Is it representative or biased?
    - Do the biases parallel economic, racial, gender, etc. disparities?
  - Is it accurate?
    - Errors minimized and understood
  - Is it meaningful?
    - Does the data appropriately model the phenomenon of interest?

- **Whose data?**
  - Is it proprietary or available for scientific critique and validation?
  - Do human data subjects have a say in how the data is collected and/or used?
Data-Driven Innovation: Panacea or Hype?

- **What algorithm or method?**
  - Is the algorithm open or proprietary?
  - What are the algorithm’s assumptions?
  - What are the algorithm’s limitations? Error bars?

- **What are we doing with the data?**
  - Scientific understanding? Large scale trends? Decisions about individuals?
  - “Prediction”?  
    - Correlation v. Causation
    - Self-fulfilling prophecy and feedback issues?
    - Stereotyping and over-generalization?
    - Rapid change and tipping points?

- If “data is the new oil,” we should watch out for smog and oil spills
Data-Driven Innovation: Privacy and Security

• For data pertaining to individuals:
  
  • Who has access to the data?
    • Hackers
    • Law enforcement subpoenas
    • Malicious insiders
  
  • Is it “anonymized”?
    • How effectively?

  • How long is it retained?

  • Who makes decisions about its use?
    • How are use decisions made?
    • Is consent required? When is it meaningful?

  • How is the data obtained?
    • How should means of obtaining data be regulated?
    • For researchers? For commercial actors?