Innovation and the "flat Internet"

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AGENDA

- Innovation in ICT: is it different?
- Innovation in the “flat” Internet
- The changing role of platforms
- The Industry 4.0 challenge
- Challenges for public policy
PECULIARITIES OF THE EVOLVING INTERNET

- Digitization and information goods
  - Shapiro-Varian 2001

- End-to-end design (originally neutral)
  - Lemley-Lessig 2000, Yoo 2013, Claffy-Clarke 2014

- System goods and modularity/granularity
  - Langlois 2002, etc.

- From goods to services ("age of access")
  - Gomulkiewicz 1998

- Multi-sidedness
  - Evans-Schmalensee 2001, Rochet-Tirole 2004, etc.
CONSEQUENCES FOR INNOVATION? (1)

- Infinite possibilities for open and distributed innovation
- End of economies of scale?
- Crowdfunding and other forms of access to credit
- Skills as a main constraining factor?
- User attention as main entry barrier?
- IP: friend or foe for entrepreneurs in ICT?
- Global value chains as global innovation platforms?
- Cities as new platforms?
FROM THE “SPAGHETTI BOWL” TO THE “LASAGNA”...

Innovation can take place at all layers. Public policy can affect its intensity as much as specific business models determine its direction and distribution.
... TO THE “CLOUD TIRAMISU”

Cloud delivered services
(SaaS, PaaS, AaaS, IaaS)

Cloud platform
(Operational and business support services)

Virtualized resources
(Virtual network, server, storage)

System resources
(network, server, storage)

Physical (transport) layer
(e.g. coaxial cable, backbones, routers, servers)

Fixed
(xDSL, Cable, Fiber)

Mobile
(LTE, WiMax, etc.)

Other
(eReaders, PDAs)
“On the Internet, nobody knows you're a dog.”
THE INTERNET IS BECOMING FLATTER (2)

“Platformization” (Clarke and Claffy 2013)

- Rather low entry barriers
- Prevalence of open models
- Revenue sharing models (possible competition issues)

“Flat Internet”: an emerging market for QoS

- A juxtaposition of infrastructures
- Various types of CDN business models
- Diversity creates space for innovation (e.g. Netflix)
THE INTERNET IS BECOMING FLATTER (3)

Source: Palacin et al. (2013)
THE INTERNET IS BECOMING FLATTER (4)

Source: Palacin et al. (2013)
THE INTERNET IS BECOMING FLATTER (5)

- Emerging CDN strategies

Source: Palacin et al. (2013)
CONSEQUENCES FOR INNOVATION? (2)

- Innovating “as” platforms
  - High entry barriers (lock-in effects), disruptive innovation,
  - Ex. iTunes-iPod, Spotify, Deezer

- Innovating “within” platforms
  - Low entry barriers (platform facilitation), incremental innovation, single-homing
  - Ex. Apple Siri, Google Nest

- Innovating “across” platforms
  - Low entry barriers (platform facilitation), disruptive innovation, multi-homing
  - Ex. Uber, Airbnb

- Innovating “outside” platforms
  - High entry barriers (economics of attention), disruptive innovation
  - Ex. Netflix, Pixar, Xiaomi, etc.
Industry 4.0: a revolution in the making, an example of a public platform
From Industry 1.0 to Industry 4.0

1. Industrial Revolution
   through introduction of mechanical production facilities powered by water and steam
   End of 18th Century

2. Industrial Revolution
   through introduction of mass production based on the division of labour powered by electrical energy
   Start of 20th Century

3. Industrial Revolution
   through introduction of electronics and IT for a further automation of production
   Start of 70ies

4. Industrial Revolution
   based on Cyber-Physical Production Systems
   today

First Mechanical Loom
1784
A “cocktail” of technologies

- Smart objects – the Internet of Things
- Cloud computing – central data storage
- Always-on connectivity (multi-tech)
- Advanced robotics
- 3D printing
- Modular/granular value and supply chains
- Big Data Analytics for optimized management of the supply chain
The German *Industrie 4.0*
An example of smart specialization?

- **Germany as a leader in embedded technologies:**
  - Germany’s embedded system market generates EUR 20 billion annually (expected EUR 40 billion by 2020).
  - The applications sector generates annual EUR 4 billion of turnover, with an estimated value added factor of EUR 15 billion.
  - Germany’s embedded systems market is the third biggest in the world behind the USA and Japan. As part of the country’s INDUSTRIE 4.0 project, Germany aims to be the lead provider of cyber-physical systems by 2020.
  - The government launched 10 “Future Projects” as part of its High-Tech Strategy 2020 over a 10-15 years. One of them is INDUSTRIE 4.0, launched in 2011.
Challenges for public policy

- Extreme uncertainty as regards the impact of:
  - Broadband as an enabling technology
  - Neutrality as an innovation booster
  - Interoperability as a stimulus for innovation
  - IP protection and compulsory licensing
  - Privacy (GDPR) as a limit to innovation?
  - Relationship between competition and innovation policy
  - Impact on innovation of “regulating intermediaries”
Thank you!