Interop

The **PROMISE** *and* **PERILS** *of*
HIGHLY INTERCONNECTED SYSTEMS

JOHN PALFREY

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BERKMAN CENTER FOR INTERNET & SOCIETY
AT HARVARD UNIVERSITY

Search

Interoperability »

In early June 2012, Urs Gasser and John Palfrey released Interoperability: The Promise and Perils of Highly Interconnected Systems. The book is inspired by their 2005 study and paper —"Breaking Down Digital Barriers: When and How Information and ICT Interoperability Drives Innovation"—which examined the relationship between interoperability and innovation in the ICT environment. The book builds a theory of interoperability, and then illustrates how that theory works and why interoperability is relevant for consumers, companies, governments, and the public. more >

Book Information » | Breaking Down Digital Barriers » | Interoperability Case Studies | NCCR Trade Regulation Papers

Interoperability Case Study: Intermodal Containers and Global Cargo Transport

This case study is part of an ongoing series developed in support of a larger text on interoperability by John Palfrey and Urs Gasser Interop: The Promise and Perils of Highly Interconnected Systems (Basic Books, June 2012). more >

Interoperability Case Study: The European Union as an Institutional Design for Legal Interoperability

This case study is part of an ongoing series developed in support of a larger text on interoperability by John Palfrey and Urs Gasser Interop: The Promise and Perils of Highly Interconnected Systems (Basic Books, June 2012). It looks into Electronic Data Interchange interoperability. more >

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interactive (multimedia)

people

urs gasser
john palfrey
caroline nolan
david o'brien

publications

interoperability case study: the european union as an institutional design for legal interoperability
interoperability case study: electronic data interchange (edi)
interoperability case study: mobile phone chargers
interoperability case study: cloud computing
interoperability case study: the bar code/upc

more >

interactive

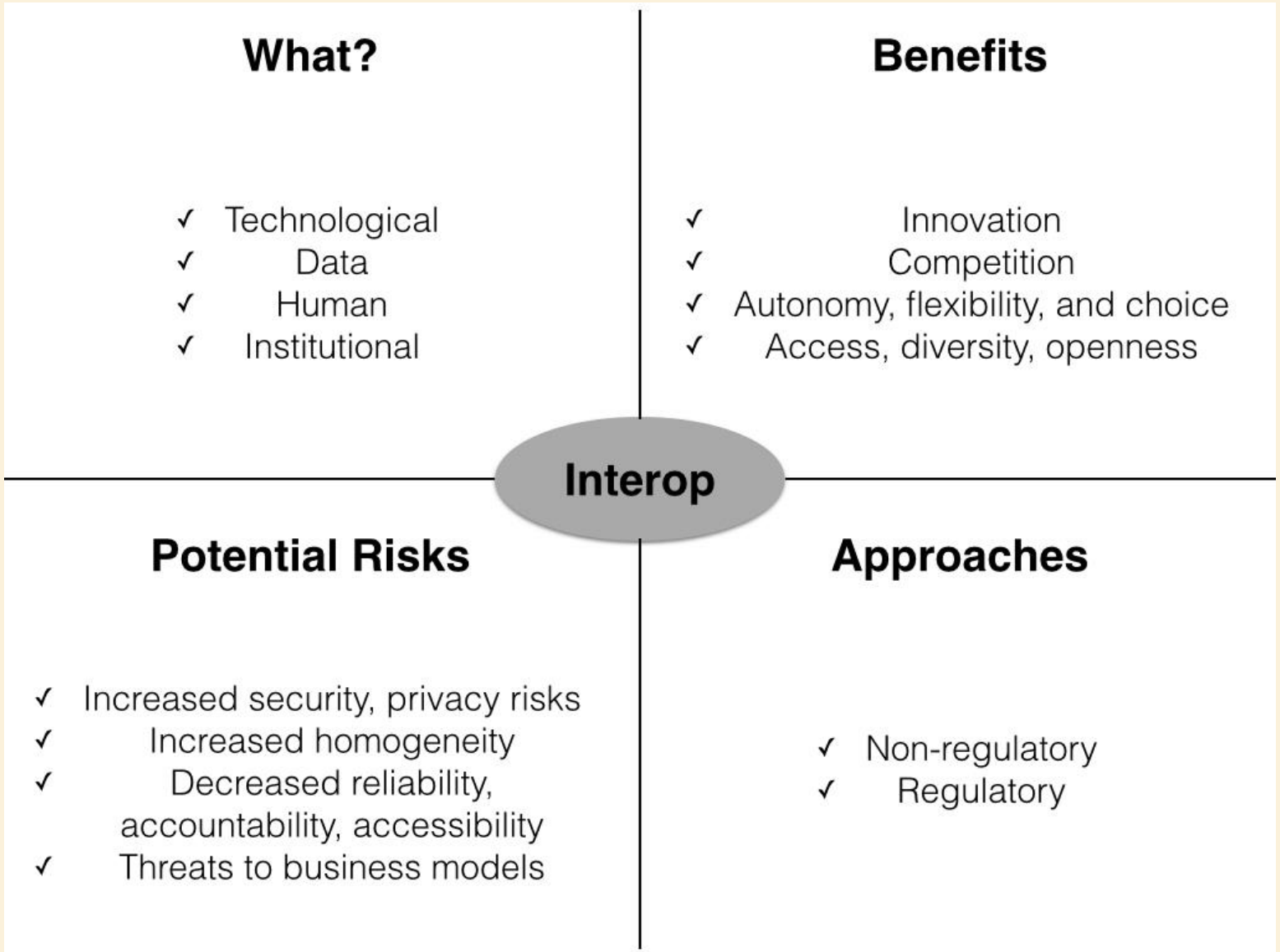
urs gasser and john palfrey on interop: the promise and perils of highly interconnected systems

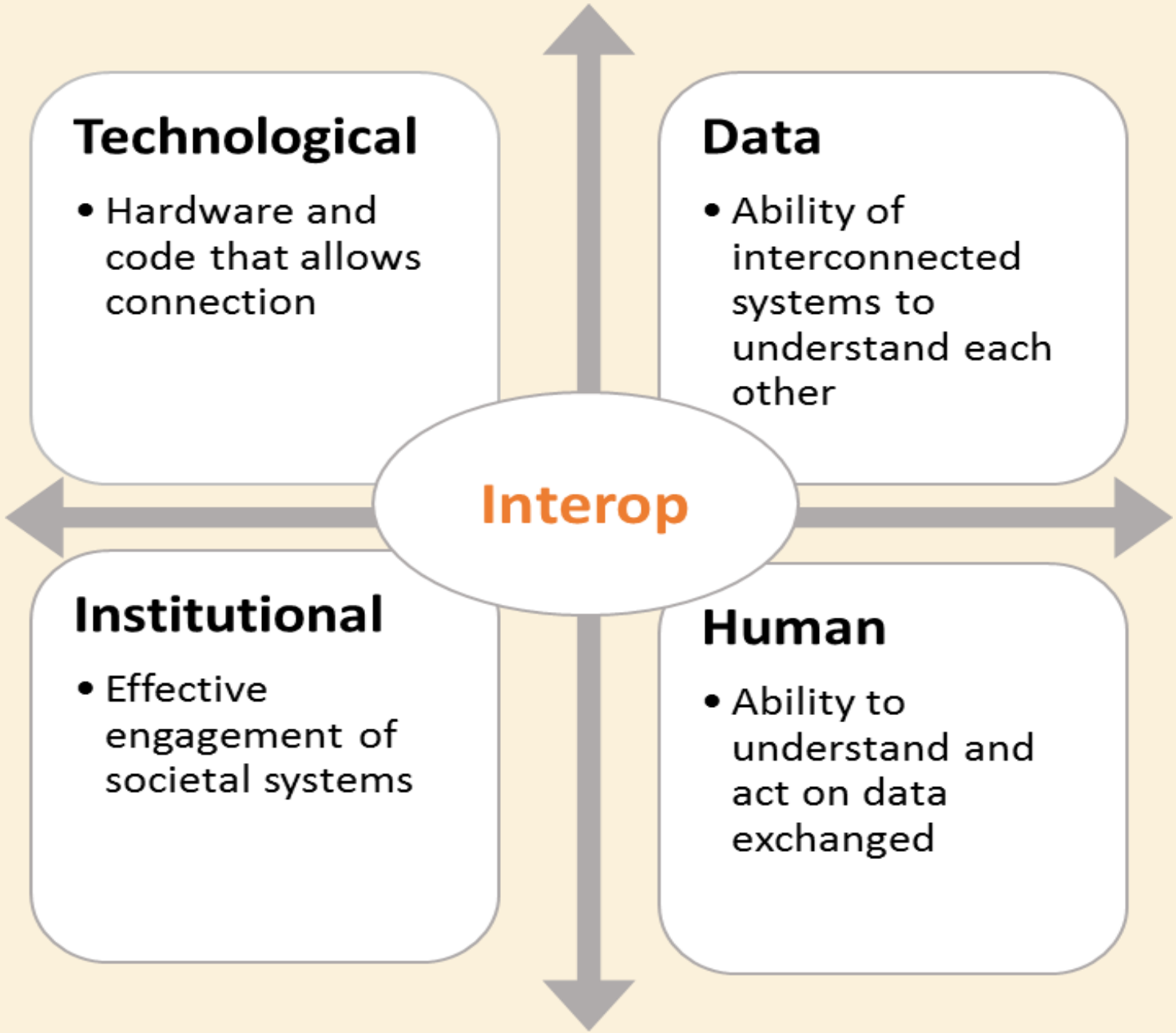
related events (past)

INTEROP

- The ability to transfer and render useful data and other information across systems (including organizations), applications, or components.

"Art and science of working together"


What?
✓ Technological
✓ Data
✓ Human
✓ Institutional
Benefits
✓ Innovation
✓ Competition
✓ Autonomy, flexibility, and choice
✓ Access, diversity, openness
Interop
Potential Risks
✓ Increased security, privacy risks
✓ Increased homogeneity
✓ Decreased reliability, accountability, accessibility
✓ Threats to business models
Approaches
✓ Non-regulatory
✓ Regulatory


Technological
• Hardware and code that allows connection
Data
• Ability of interconnected systems to understand each other
Interop
Institutional
• Effective engagement of societal systems
Human
• Ability to understand and act on data exchanged

KEY FINDINGS

- Solutions to big societal problems increasingly depend on interop
- Interop relevant to both public and private sector
- Interop as design challenge within and across layers
- Optimum levels of interop, not maximum
- Benefits are manifold
  - Systems efficiency
  - User autonomy and choice
  - Innovation and economic growth

Institutional layer
(Organizations, Law & Policy)

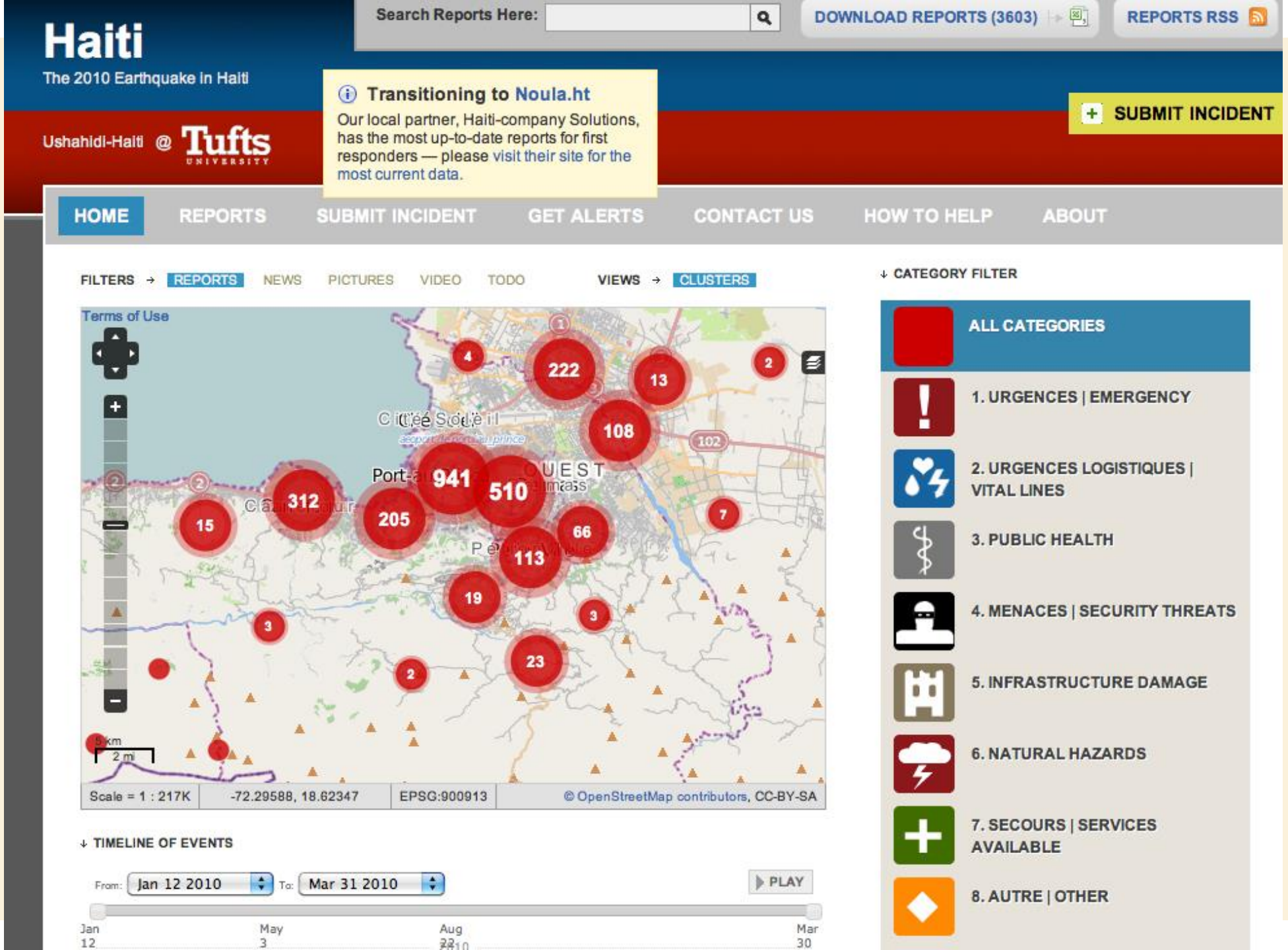
Human layer

Data layer

Technological layer

BENEFITS

facebook DEVELOPERS
Search
Documentation
Support
Blo
Hack the Graph
Build with the Open Graph. Integrate deeply into t
experience. Grow lasting connections with your us
Get Started
or Learn More
Build for Websites
Drive growth and engagement on your si
Facebook Login and Social Plugi
twitter
Language: English
Welcome to Twitter.
Find out what's happening, right now, with the people and organizations you care about.
Username or email
Password
Sign in
Remember me · Forgot password?
New to Twitter? Sign up
Full name
Email
Password
Sign up for Twitter


Haiti
The 2010 Earthquake in Haiti
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Transitioning to Noula.ht
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VIEWS → CLUSTERS
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222
13
2
4
108
102
941
510
312
205
15
66
7
113
19
3
3
23
2
5 km
2 mi
Scale = 1 : 217K
-72.29588, 18.62347
EPSG:900913
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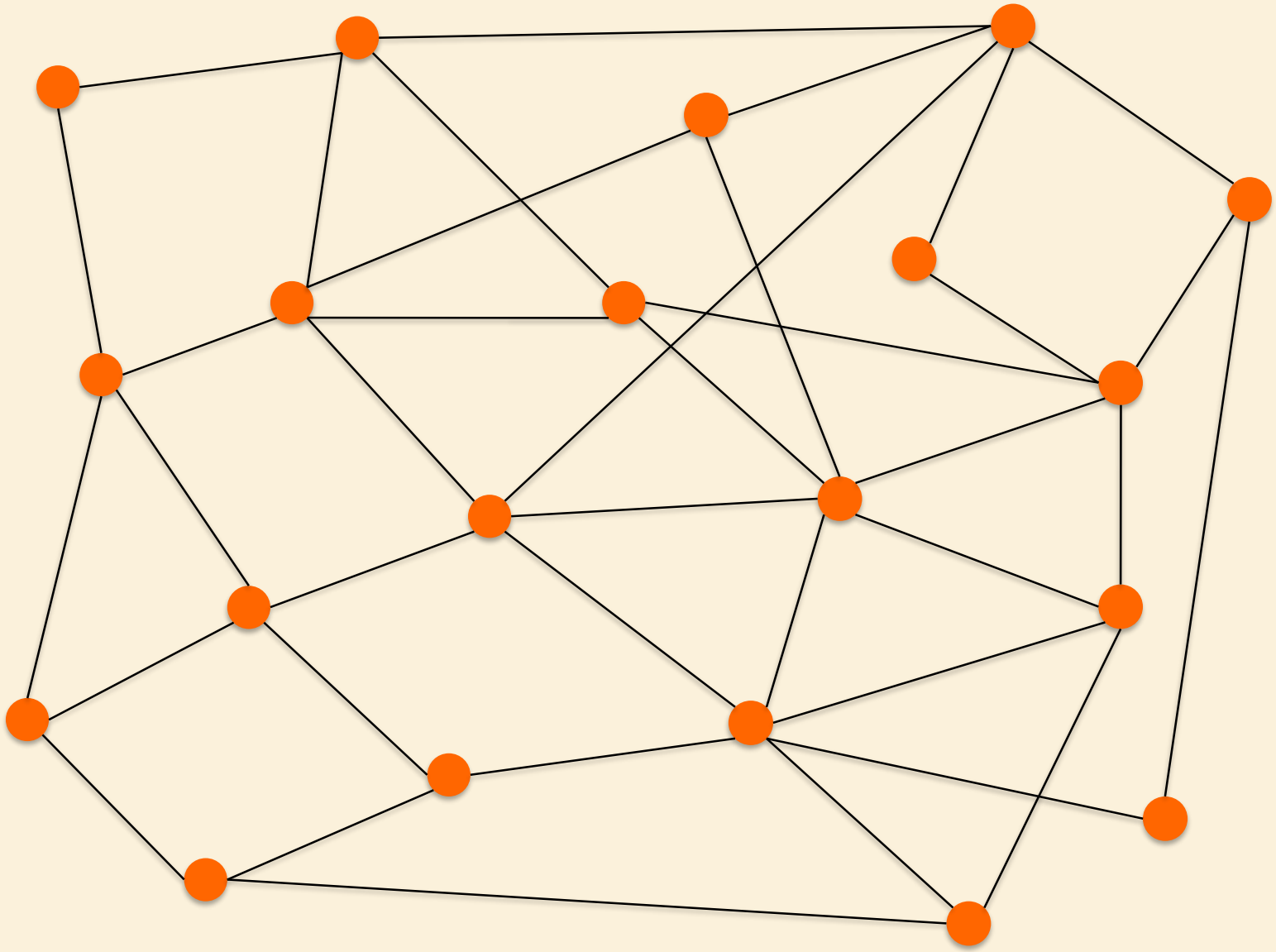
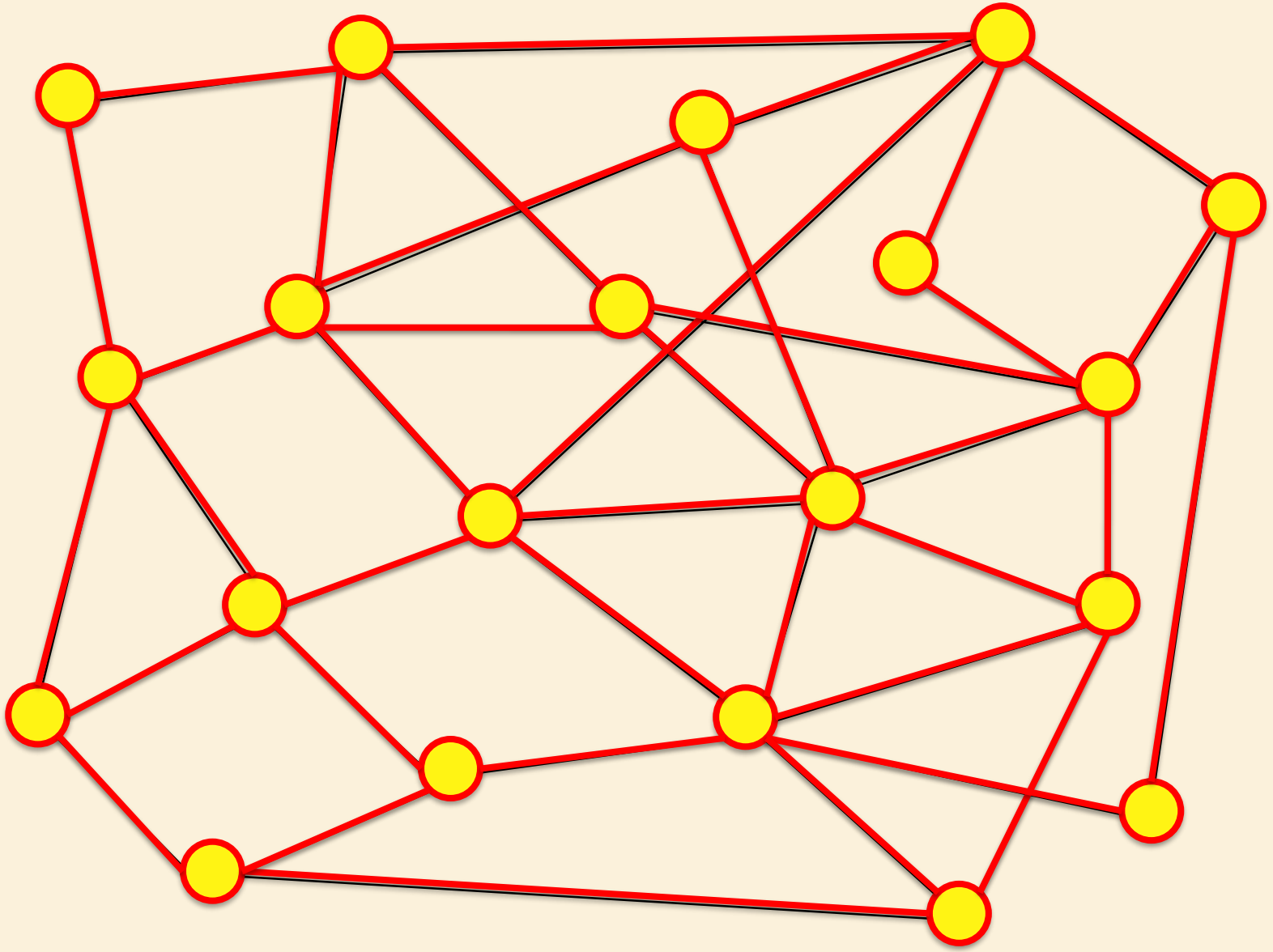
CATEGORY FILTER
ALL CATEGORIES
1. URGENCES | EMERGENCY
2. URGENCES LOGISTIQUES | VITAL LINES
3. PUBLIC HEALTH
4. MENACES | SECURITY THREATS
5. INFRASTRUCTURE DAMAGE
6. NATURAL HAZARDS
7. SECOURS | SERVICES AVAILABLE
8. AUTRE | OTHER
TIMELINE OF EVENTS
From: Jan 12 2010
To: Mar 31 2010
PLAY
Jan 12
May 3
Aug
Mar 30

INNOVATION

- Interop – competition – innovation cycle
- Theories of innovation
  - Generativity (Zittrain)
  - User-driven innovation (Von Hippel)
  - Small-step innovations (Christensen)
- Caveat: Competition for the market; anti-competitive behavior (e.g. standards)
- Also: Diffusion of innovation (e.g. HDTV)

DOWNSIDES



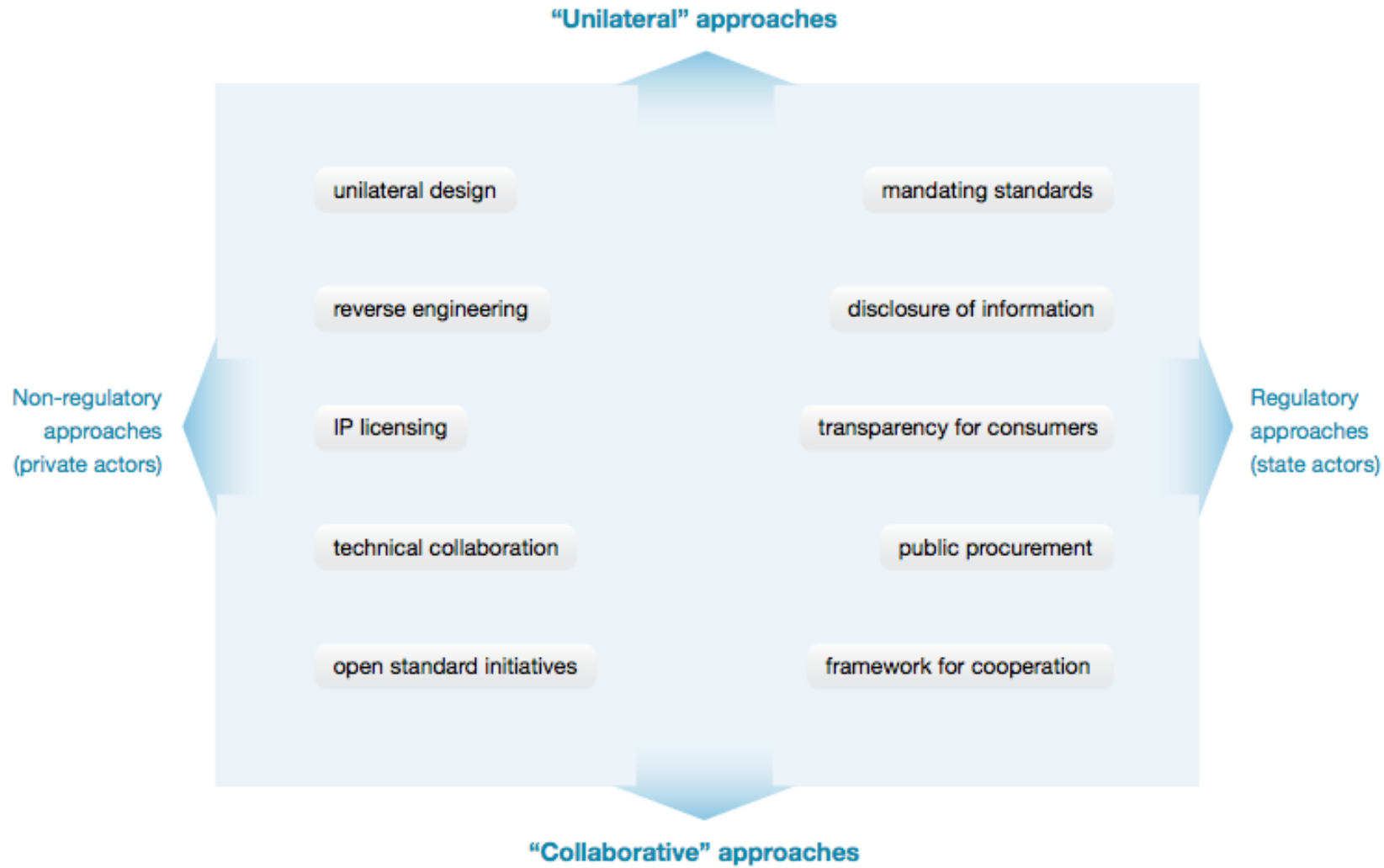


PRIVACY & SECURITY RISKS

- Privacy and security as possible drawbacks of high interoperability (multiple entry points)
  - How about diversity?
- On balance, however, benefits outweigh risks
- Privacy and security as design/implementation problems
  - "Design" includes not only technology, but also law, social norms, and shaping of market forces

APPROACHES

- Achieving interop can take a long time
  - Many actors (e.g. health care)
  - Legacy problems (e.g. air traffic)
  - Complexity (e.g. smart grid)
- Many ways to work towards more interop
  - Private vs. public sector driven approaches
  - “legislation by threat”


"Unilateral" approaches
unilateral design
mandating standards
reverse engineering
disclosure of information
Non-regulatory approaches (private actors)
IP licensing
transparency for consumers
Regulatory approaches (state actors)
technical collaboration
public procurement
open standard initiatives
framework for cooperation
"Collaborative" approaches

INTEROP STRATEGY

- In Digital Business, Interop strategy is key
  - Defensive, mixed, interconnected, truly interoperable approaches
  - Design, interfaces/APIs, licensing, collaboration
- Various factors shape strategy on markets with strong network effects
  - Initial competitive advantage (e.g. strong user base, reputation) suggests non-interop strategy
  - Case in point: Apple

CORPORATE STRATEGIES

DEFENSIVE APPROACH

- Sony PlayStation 3
- "HBO Go" & Games of Thrones
- Apple, Mac OSX and non Apple Hardware

MIXED APPROACH

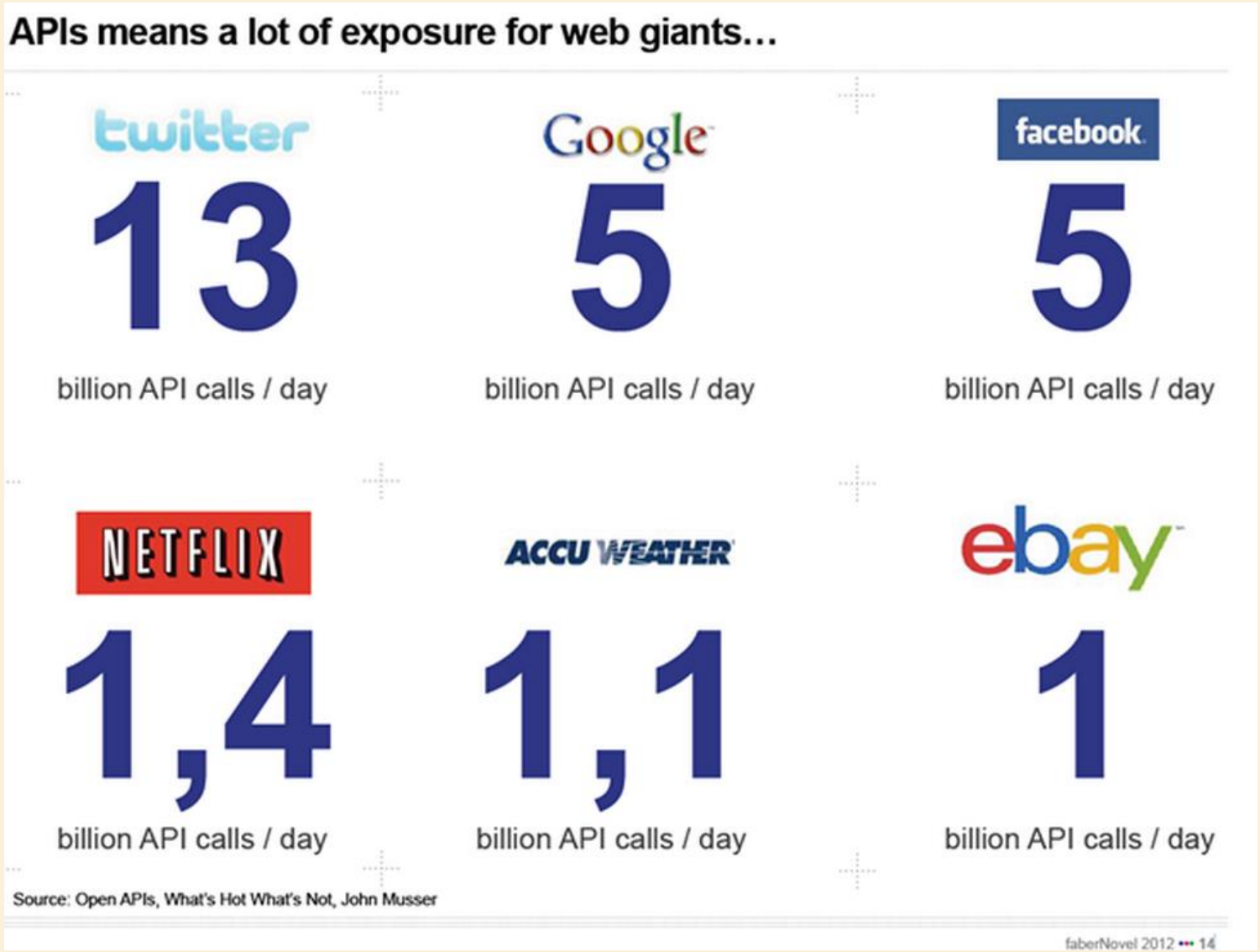
- iPods, iTunes, DRM + Record Labels
- iPod, iPhone + iPad Accessories
- Microsoft and Novell Joint Venture

HIGHLY INTERCONNECTED

- Google + Android
- Google's Open Social API
- History of Microsoft Windows

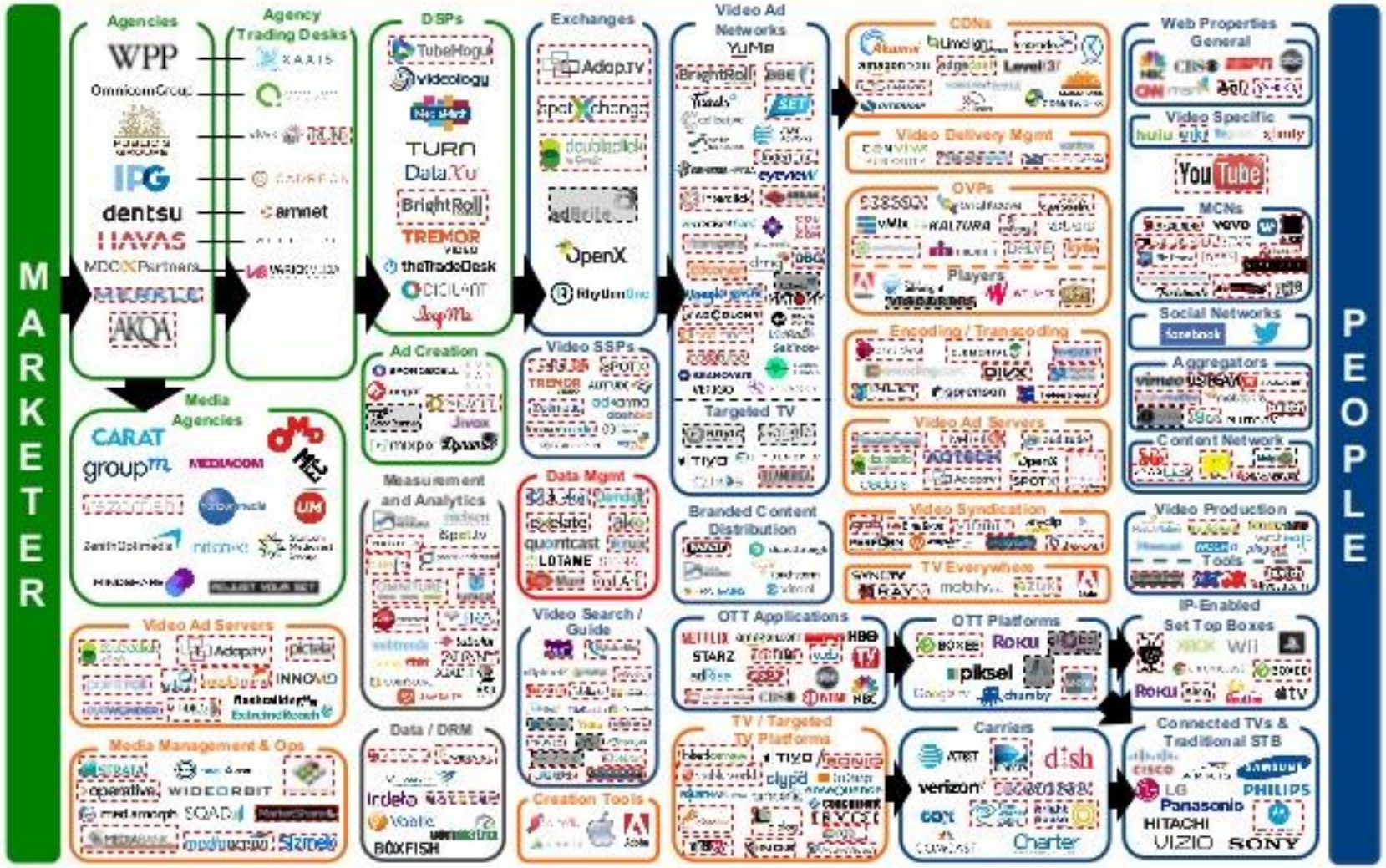
TRULY INTEROPERABLE

- Facebook
- Twitter
- Pinterest



http://nbry.wordpress.com/2013/02/10/open-innovation-and-distributed-business-model-through-api/

CHANGES OVER TIME

- A company's Interop strategy is likely to change over time
  - Example Microsoft (active role in cloud interop)
  - Example Twitter (more restrictive API use)
- Management of Interop strategy over time is essential
  - Not only tech and data interop, but also organizational, human, and legal interop

VIDEO LUMAscape