

Visions of the future internet ©

Jonathan Cave
RAND Europe and
Warwick University

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Findings about the evolving internet from two projects

- Towards a Future Internet: Interrelation between Technological, Social and Economic Trends (TAFI)
 - Recently completed study of links among technological, social and economic trends related to the future internet, future needs of internet users, and principles that should guide its future development.
 - Core institutions: Camford Associates , Keio University, *Oxford Internet Institute*, SCF Associates, University of Aalborg/ITU, Warwick University
- Study in support of a Future Internet Public-Private Partnership (FI3P)
 - Ongoing study to identify in quantitative and qualitative terms the potential economic and societal longer-term impacts of the application driven public-private partnership on Future Internet
 - Core institutions: IC Focus, IDC, ISMB, *RAND Europe* , WIK Consult



TAFI Findings

- 2/3 of Europeans already use the Internet. (How) can we guide technology evolution to serves their future needs?
- Used environmental scanning, online Delphi, workshops and scenario analysis to identify and analyse trends, change drivers, future needs, technological options and likely socio-economic impacts.
 - Internet will soon be the main platform for social interaction, as vital as electricity for most business. Age, gender, disability divides will shrink – but not geographical, wealth, education
 - Near-term revolutionary technology change is unlikely. Infrastructural vulnerabilities are deeply embedded, hard to fix and threaten safety-critical services. The lack of trust in personal information use will be the highest barrier to personal use.
 - Four scenarios: Smooth Trip; Going Green; Commercial Big Brother; Power to the People
- Main trends and drivers of future internet needs
 - Economic: emerging market influence; ageing workers/reskilling, home health and social care
 - Social: billions of new developing world users; complexity of daily life; social apps everywhere
 - Technological: increased co-production; real-world interactions; knowledge processing, Big Data
 - Psychological: dependence drives demand for protection, resilience, trust & privacy; increased diversity and cultural reassurance
 - Human interface: mobility, language diversity, immersive media; identity definition, protection

TAFI highlights

- Time for deeper consideration
 - Much time has passed and many actor have played their parts
 - Enormous and growing size, scope and importance
 - Technocracy and technocentrism don't work; doubtful they ever did
- A slight improvement: technology as an enabler and source of constraints
- Likelihood of a future potential failure
 - Complexity breakdown, grinding to a halt,, ...
 - power asymmetries or robust-yet-fragile
- Human interface environments shape uptake and innovation
- Shift from internet of PCs to 'internets' of things, people, ideas,...
- Regulators need to understand the Internet and complex adaptive systems – to recognise what they cannot control alone and what cannot be controlled
- 'Infrastructure architecture' include today's services and applications
- Some want 'socioeconomic' perspective on user requirements and functional specification; others place more faith in evolution and 'self-organised criticality'
- Properly multidisciplinary 'Internet Science' is needed

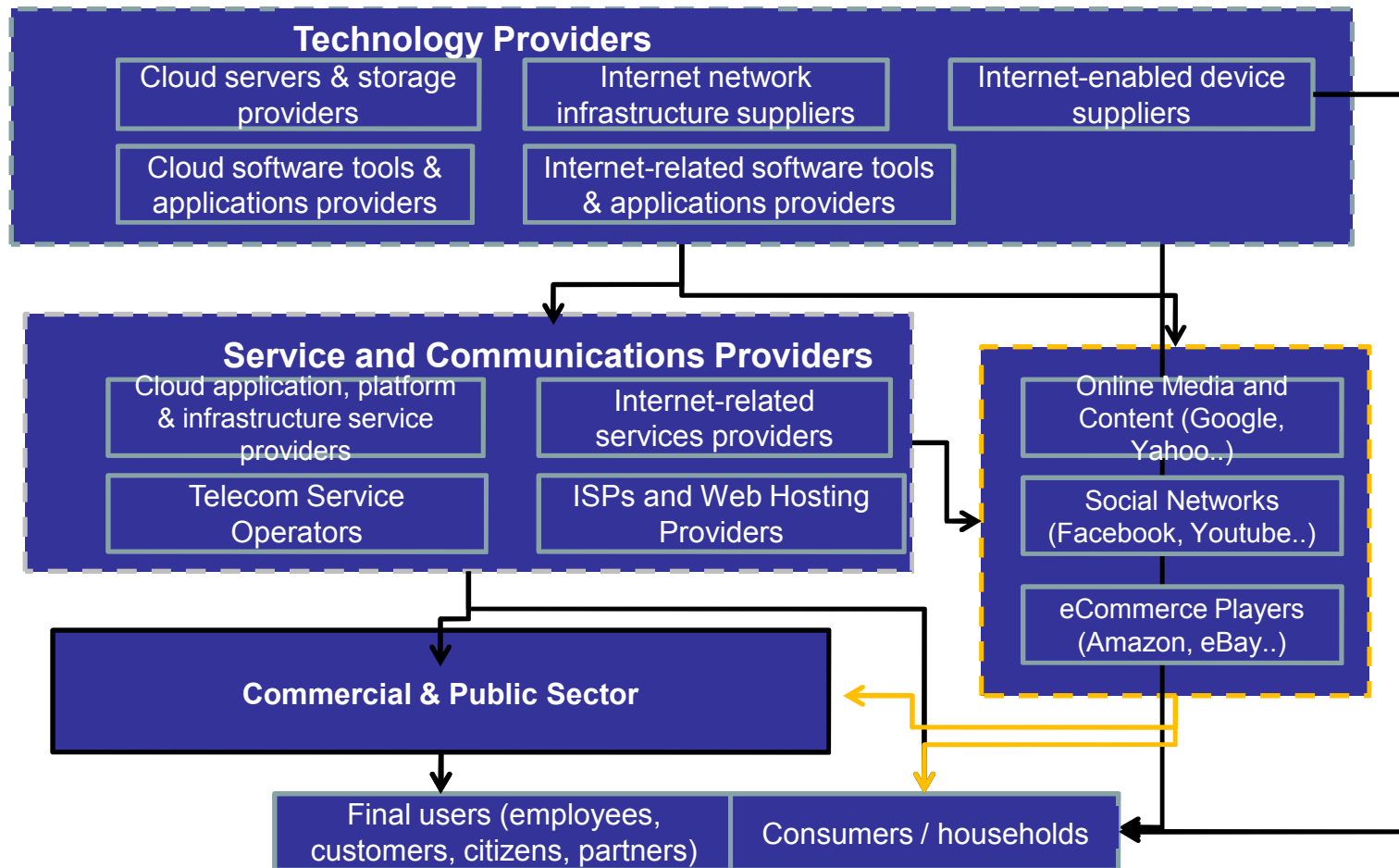
FI3P in support of Future Internet PPP

- Operational definitions of FI
- Assessment of current European Internet industry, sector, economy
- Analysis of near-term and post-2013 FI PPP policy options
 - Rendition in models
 - Development of scenarios
 - Impact Assessment
- Brief introduction to first two items

Operational Definition

- Policy relevance
 - what generates important impacts, what can be influenced, what lies within competence?
- Consistency with literature – including conceptual analyses
 - how to avoid conflation of Internet/web; Internets of X; Internets as a metaphor
- Correspondence with measureable and aggregatable indicators of present state
 - Which firms, and which activities within firms?
 - How to identify and allocate revenues?
 - How to assess non-monetary costs, benefits, activities, entities?
- Need for a future-proof definition
 - Convergence, divergence and emergence of sectors
 - Indirect and non-monetary ‘business models’
 - Joint products and public goods
- That said, here is the industry structure that fits current data

European Internet Industry Structure



Current European Internet industry (EII)

- 2009 Internet technology and service revenues were €121.9 B;
- 60% from (Internet-related) telecom services spending, but Internet IT and Networks will grow faster (and also drive other parts of IT budgets)
- This is 23% of ICT market but will grow to 31% by 2014.
- EII Top 100 had combined revenues of €110.7 B in 2009 from Internet-related activities in the EU alone. However, this covers considerable asymmetry : the largest company generated more than €12 B; 100th generated only €22 M. This indicates strong fragmentation in the industry and considerable market power.
- Also asymmetric as to country of establishment (Fr, UK, Nordic), segment (telecom = 44%, software = 20%, service providers = 13%) and reach (55 global, 25 local)
- Continuing business model evolution

Implications for the future

- Contribution to ICT impacts on productivity, sustainable growth, equity and economic efficiency is hard to separate.
 - Need better tools, models and data to handle dynamics of the Internet economy
 - ICTs are traditional source of economic growth and recovery, but hard to ‘embed’ – this is probably more true of the FI as a “glocal” commons than of ICTs *per se*.
 - EU firms dominate EU telecom and IT services, but US/global firms dominate the innovation-friendly elements
 - Struggle for dominance between technology, application, service providers likely to be critical
- The provision, maintenance and regulation of the Internet itself is likely to remain a subject of acrimonious debate, e.g.
 - As recession erodes public and political support for large infrastructure projects, public funding may drop; private parties will continue to provide infrastructures, but attempt to assert control at all layers (e.g. aspects of NGNs, Walled Gardens)
 - As economic value-creation and innovation move into the service and application layers, profitability will drop for infrastructure providers and the sector as a whole; this may limit or distort FI development

Regulatory challenges

- While core technologies are developing rapidly
 - Implementation (esp. in Europe) is lagging
 - Complementary technologies are yet to take off
 - Other problems of privacy, security, liabilities, etc. remain unsolved
 - Small innovations (esp. in the EU) face steep and increasing hurdles in scaling up and spreading out without takeover or relocation
- The EU telecommunications regulatory framework has led the world
 - It may not generalise to the Internet
 - The regulatory approaches from affected domains are inconsistent
 - The scope and implications of e.g. technological, content, service, network ‘neutrality’) remain unclear – see latest EU survey on NN
- Stakeholders have proposed regulatory holidays and support for collaboration, standardisation, exploitation, community building & outreach, research on regulatory issues, but these may have ‘rebounds’
 - Temporarily tip playing field in traditional markets and business models in favour of incumbents, and encourage them to rest on their laurels.
 - Reinforced by natural reluctance of hard-pressed EU governments to put any strain on their ‘national champions’

Contacts

- TAFI: www.internetfutures.eu/
- FI3P: <http://www.fi3p.eu/>
- My email: cave@rand.org