

The economics of information for citizens, communities and commerce

FIA Valencia: 15.00 – 17.00 Wednesday 14 April

Background

Digital information is the principal asset of the Internet and systems are increasingly focusing on evolving networks of autonomous applications and people interacting with processes for the production, publication and retrieval of information. The growth in Internet usage and system-to-system interaction will require infrastructures that support billions of information exchanges and understanding of the micro- and macro dynamics in terms of structure, information, behaviour and economics. Digital information is now the enabler for creativity, innovation, decision making, economic output and enjoyment. Understanding the nature of digital information, how it can be used for societal and economic benefit, and how it is governed will be essential for the success of the Future Internet.

The Future Internet will become a ubiquitous interconnecting fabric, dynamically linking users with services, content and embedded devices and networks in an more 'converged' and seamless fashion. In this 'converged' Future Internet, such information exchanges across organisational boundaries will become more pervasive, complex and dynamic, yet also more critical to successful business and societal interactions. In the recent EC communication "A public-private partnership on the Future Internet" the Future Internet is described as a tool for a smarter world¹. Smart infrastructures are cited in energy, environment, transport and healthcare sectors all promising *to make extensive use of connectivity and distributed information processing to redesign their business and operational processes and make them 'smart'* ². This leads to the question of how do infrastructures become smart? or to put it more explicitly how can infrastructures determine core aspects of opportunities and threats in open environments (including people, applications, sensors, actuators, etc) in which they interact and make clear decisions at huge scale in real-time which bypasses irrelevant information and achieve solutions smoothly, effectively and efficiently.

The key ingredient is the ability to share information (e.g. network, application, users, location, time, etc) between citizens, communities and commerce. For example, smart energy systems that deliver efficiency savings will require accurate real-time information from consumers (smart meters), the environment (meteorology forecasts), and transport infrastructures to predict future demands; consumers want more accurate and timely Quality of Experience (system behaviour as experienced and measured by consumers) and Quality of Service (system behaviour as measured by providerS) to intelligently select the best supplier for their requirements; network operators want to know the characteristics of application packets to optimise delivery paths, business performance and to preserve levels of investment; e-Commerce retailers, search engines and social

¹ http://www.future-internet.eu/fileadmin/documents/reports/Final_Report_Model_PPP__270409_.pdf

² We should also not ignore the importance of the Enterprise's and media sector's contribution to European economic output even though these are not included in the communication.

networks want personal information and derived behaviours so that applications can be wrapped in highly personalised advertising; enterprise systems will increasingly rely on knowledge sharing as well as digital assets trading to become far more flexible, adaptable and open than today, thereby enabling enterprises to tap into the latest business opportunity and form dynamic value networks³.

In all cases, individuals or businesses assess the relative benefits of protecting or disclosing information, sometimes governments mandate disclosure. For citizens, this decision is often not a conscious process but for most businesses and governments risks are assessed, even if imperfectly. Often, non-disclosure produces information asymmetry in markets (P2P vs Network Operators) and significantly affects the balance of power and its overall performance. In such cases, where greater balance is required regulatory bodies can mandate information disclosure, but only by assessing the rights of one side over another considering specific relative costs and benefits of those involved.

For Enterprises operating in the digital economy, determining and maintaining the value of information and risks in respect to decision makers depending upon information is increasingly important. Digital information is extremely heterogeneous (e.g. media content, sensor data, software, etc) and business must adopt structures, processes and agreements to govern information but in a way that does not restrict innovation for themselves, partners and customers. However, what constitutes business innovation has exercised scholars for a long time⁴. One main challenge is that the economic properties of digital information are curious in contrast to physical assets:

- 1) Information is an intangible asset in contrast to the traditional sources of value to business enterprises;
- 2) Information is non-rivalrous in that the “consumption” or use by one party does not prevent the simultaneous consumption or use by other parties;
- 3) Information is non-excludable in that the consumption or use by one party does not exclude consumption or use by others; and
- 4) Information diffusion is possible at extremely low marginal cost and faster networks, cheaper storage and more efficient applications continue to reduce this cost⁵.

These characteristics have led to tussles between those that want to close and control and those that want openness and freedom. Technical platforms, business models and laws have been developed that try to assert or apportion control over digital information (e.g. Amazon, Apple, and - accordingly to some - Google) arguing the need to protect investment, whilst the open communities continue to promote the use of the “commons”, as the basis for greater innovation and societal good⁶. The challenge is not whether one is right or wrong but how both situations can coexist.

³ European Commission (2008), *Unleashing the Potential of the European Knowledge Economy – Value Proposition for Enterprise Interoperability, Final Version (Version 4.0)* http://cordis.europa.eu/fp7/ict/enet/ei-isg_en.html

⁴ See, e.g., the work of Clay Christensen, Henry Chesbrough, Eric von Hippel, Donald Tapscott, Kim and Mauborgne, to name but a few.

⁵ This particularly has huge implications in that the principle of scarcity, which is a cornerstone of traditional economics, is not applicable to information goods. For one of the most recent publications, see Anderson, C. (2009), *Free: The Future of a Radical Price*, New York: Hyperion

⁶ There is a large amount of literature in this area, e.g. Benkler, Lessig, Shapiro, Varian

Information sharing is a complex issue with many deep socio-economic concerns, phenomena and tussles. It is related to aspects such as open vs closed cultures, intellectual property, privacy, information value, risks and rewards, incentives and even societal freedoms and values. The objective of this session will be to examine information sharing from an economic perspective as the basis for providing insights into how smartness can be achieved in the Future Internet.

Proposed Sub Topics

- Information as an economic good and implications for business models (Man-Sze Li)

What are the economic foundations for treating information as a good? What is the impact on the economic mode of exchange and the relationships between providers and consumers? Is a “new” economy on the horizons as a consequence? In the so-called “race to the bottom”, is there money to be made?

- Information value and the long term preservation of digital assets (Michael Boniface)

What value chains and business models underpin preservation strategies (interconnection between preservation, access and sustainability)? Where’s the content value, where’s money coming from, how to keep it coming, and how preservation and access should be mixed. What technical strategies, e.g. migration and multivalent, for keeping files alive and accessible over the long-term considering costs, technological obsolescence and emerging archive service business models.

Case Studies:

BBC Online Archive: the main interest is public value. This has been a consideration ever since the original plans of Greg Dyke in 2003 which resulted in the Creative Archive. The focus was a “service ... free and available to everyone, as long as they were not intending to use the material for commercial purposes.”

INA: combining public access and commercial sales. Rights licensing as a means to support core activities. Balancing freely available content to the public through www.ina.fr against several controls to ensure that the offer of free content would not cannibalise Inamédiapro’s business of licensing rights to professionals.

- Information asymmetry and tussles between service providers and network operators (Tuan Trinh)

Information asymmetry will - at some points in the value chain - create unfairness which in turn might have undesirable consequences on the performance of the Future Internet. Regarding Future Internet governance, we need to address the issue of decision making if only incomplete and uncertain information are available. Finally, the roles of the stakeholders in the Future Internet are getting more and more complicated with the borders are getting blurred and even one stakeholder might have different roles at the same time. We argue that this phenomenon will have a significant impact on Future Internet architecture in general and the business models of the Future Internet in particular.

- The changing nature of risk perception and the disclosure of personal information or Making public data public and the exploitation of non-personal government data (Nick Wainwright)

More details to follow....

Session Structure

- 15:00 Introduction (10 mins)
- 15:10 – 16:50 Subtopic Sessions (1h 40mins)
 - 4x 25 minutes covering selected information aspects
 - 10-15 minute presentation with 10-15 minute discussion on each topic
- 16:50 Concluding Remarks (10 mins)