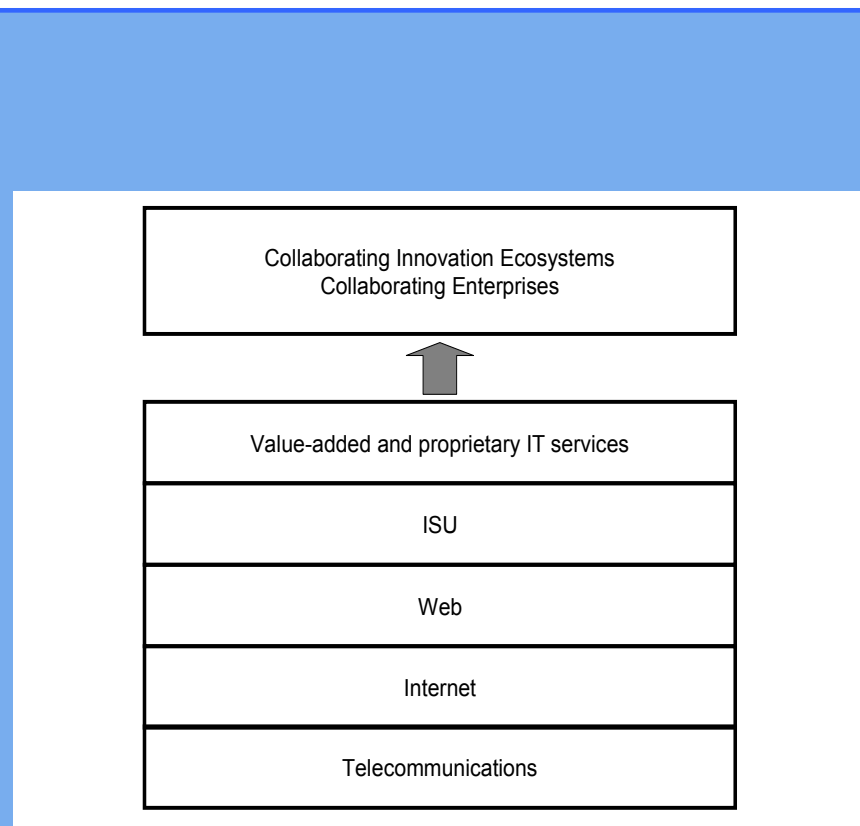


The Economics of Utility Services in ICT

Man-Sze Li
IC Focus
UK

- Delivery of IT as services
- Interoperability as a
 - utility-like capability for enterprises
 - a public good
- ISU as a basic infrastructure that supports
 - information exchange between knowledge sources, software applications and Web services
 - a new generation of self-* services and e-business services
 - connection between islands of interoperability
 - especially SMEs and start-up companies
- ISU is independent of, rather than an extension to, EI solutions on the market



Conceptual View of the ISU

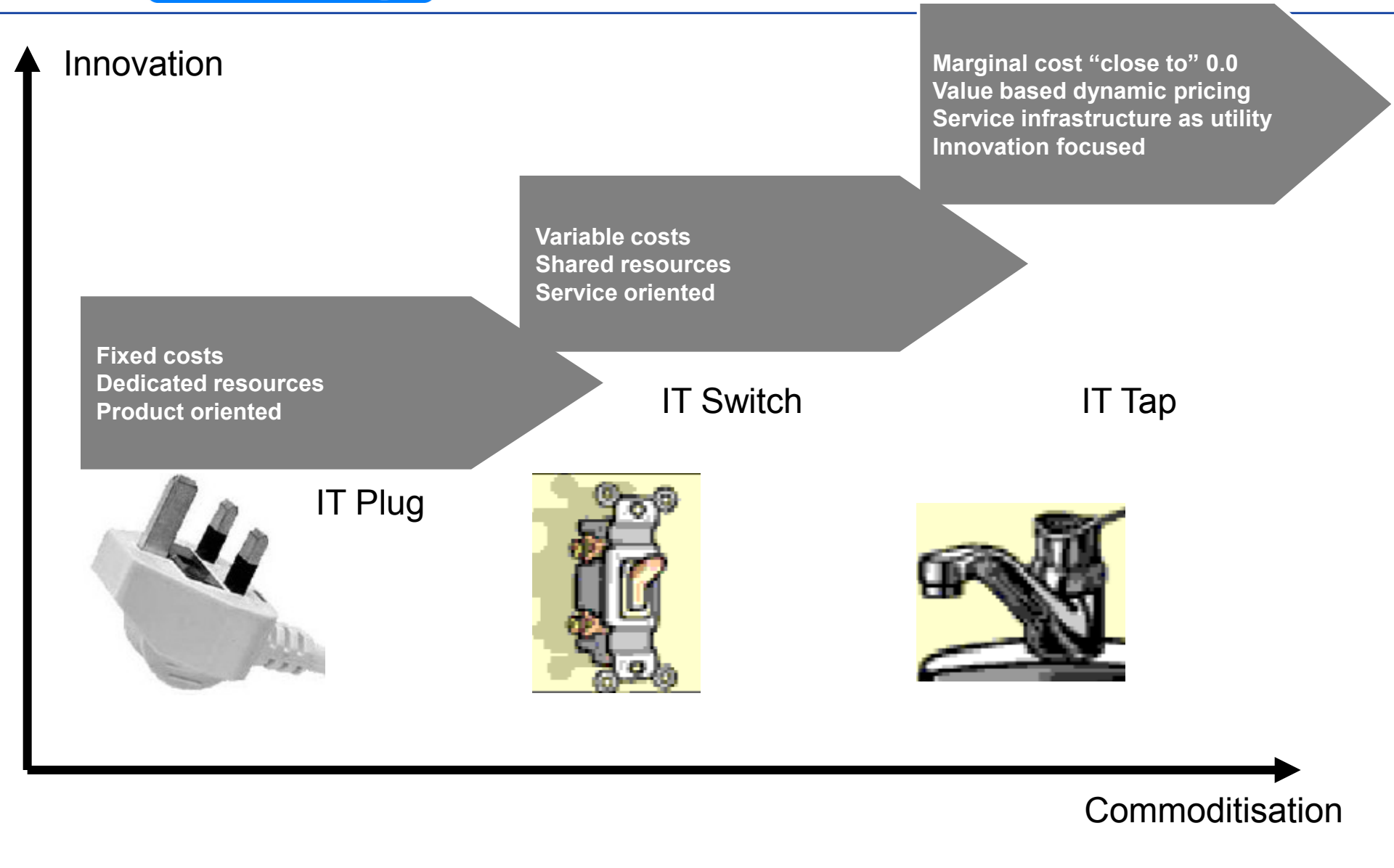
- Design Principles
- Service Definitions
- Business Case & Ownership
- Regulation & Governance

“The business case for the ISU is probably one of the most challenging research areas in this Roadmap. It also goes to the heart of the sustainability of Enterprise Interoperability as a value proposition. The key questions are: (1) How can enterprise interoperability be sold as a utility, rather than as an adjunct to a commercial offering? (2) What would be a viable pricing model for technical functionalities delivered as services? (3) Who would be the ISU business partners and what kind of partnership arrangements would be appropriate? and, finally (4) Who would (should) own and/or operate the ISU?”

- FP6 and ongoing FP7 projects: little/no specific research carried out on value, value proposition and business models; where it existed was of limited focus
- SaaS: long(er) term picture is unclear
- Literature: surprisingly little scholarship on applying the notion of utility to business models in ICT
- FI research: only a handful of projects so far have dedicated resources to systematic business model research and analysis (though situation is expected to change)
- A number of relevant European studies on FI: market studies, socio-economic studies and impact studies – results expected in the next 2 years

- Utility business models and Web enterprises (Rappa, 2004)
- “IT doesn’t matter” and the “Big Switch” (Carr, 2003, 2004, 2008)
- “Open Business Models” (Chesbrough, 2007)
- The “generative” argument (Zittrain, 2008)
- The business models of “free” (Andreson, 2009)
- A new framework for the evolution of specific technologies (Arthur, 2009)
- The rise and fall of “information empire” (Wu, 2010)

Evolution of Services Paradigm



IT Plug



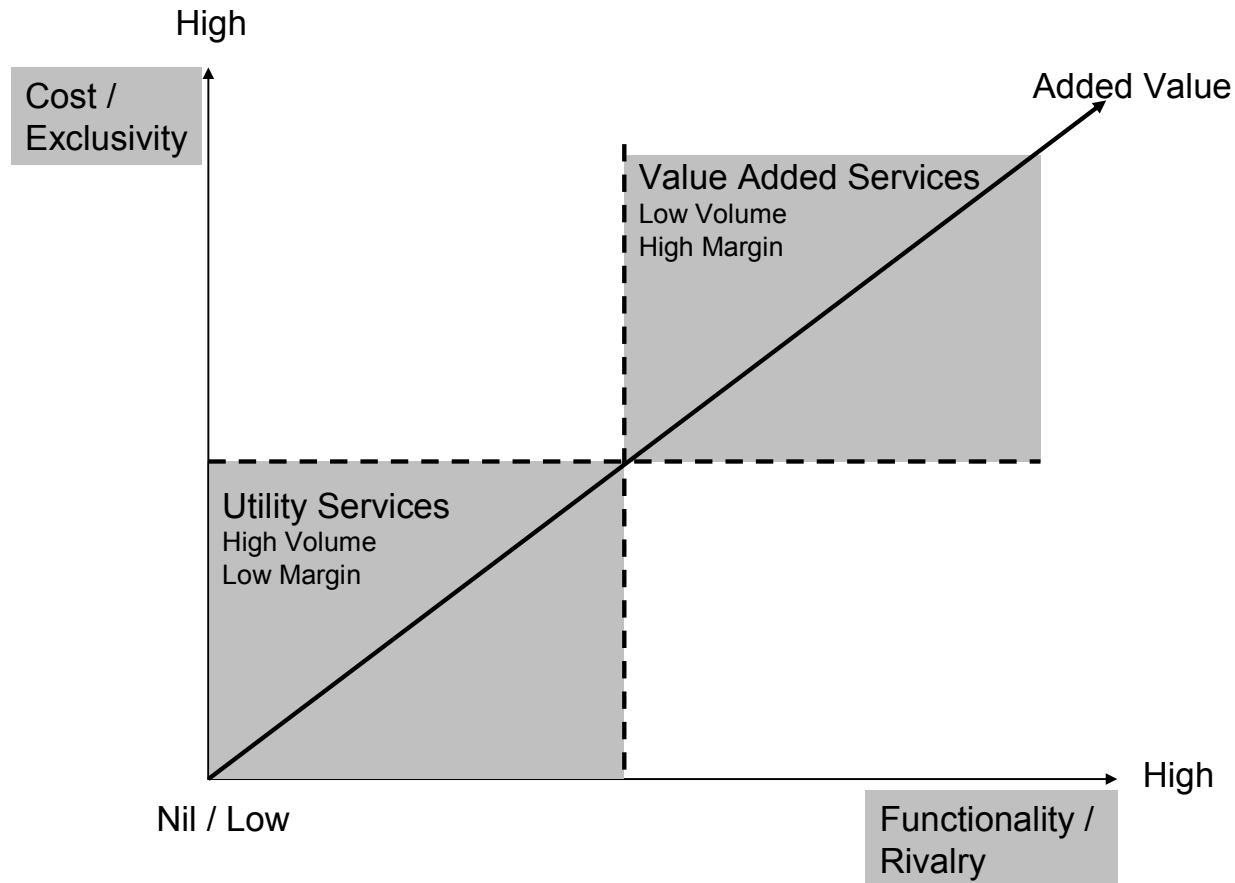
IT Switch



IT Tap

Classification of Utility Services & Value Added Services

Source: Li, 2007



Necessity: it has to work and it needs to be (near) universal

- Cheap and near universal access
- Seamless Quality of Service across multiple providers
- Well understood, regulated and monitored service properties
- Potentially high internal complexity, but limited external configurability/heterogeneity
- Well-defined and standardised interfaces for utility usage and control
- Ease of use

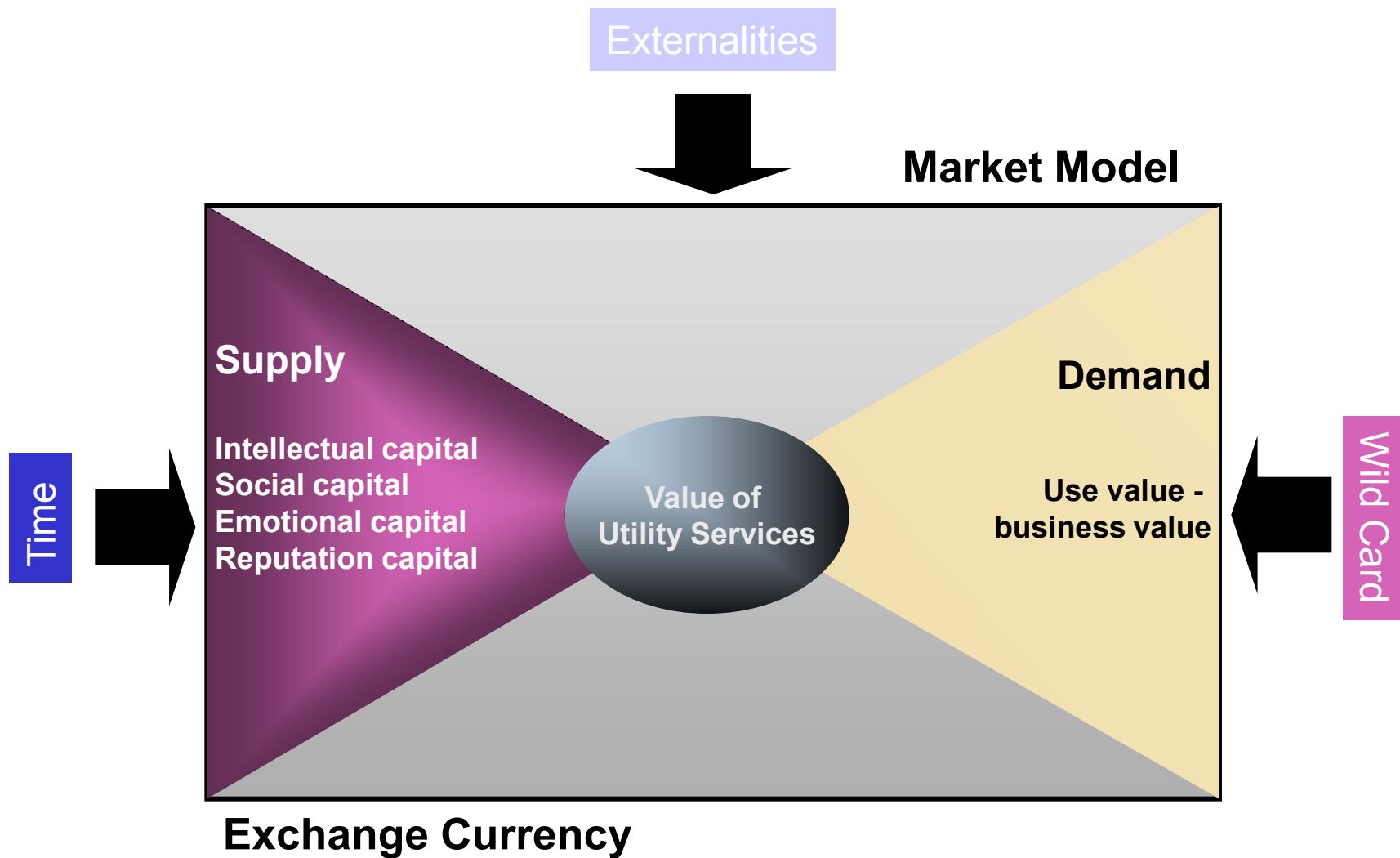
Central premise based on the ISU concept: the universal service argument may in future be extended beyond broadband to a service infrastructure comprising utility services on top of the communications infrastructure of the Internet

- Economic argument: ICT trends towards commoditisation, continuously eroding the cost base of providing services
- Public interest argument: some services offered over the Internet are part of the fabric of the economy and society, essential for all businesses or for minimum “quality of life”
- Competition argument: a level playing field in basic (utility) service provisioning for advancing open competition, greater transparency and unfettered innovation through new, value added services

... new business models based on the utility paradigm are possible and should be guided by the quest for the interconnected notions of innovation and value creation

... no linear relationship can be established between single technologies, technology trends, market and societal deployment of these technologies and socio-economic outcomes or impacts

- The business and organisational impacts of the ongoing innovation trends, related with the Internet; the potential impacts of the Enterprise 2.0 innovations is one example
- The driver on the supply side to increase the range of applications and services in their offerings and to widen their market to new user categories and usage patterns; Web Services and then SOA in the past decade and the more recent Cloud Computing are major examples
- The push from the research community to promote Future Internet R&D
- Measures applied by the public authorities, notably the EU which seeks to nurture European leadership in world class Future Internet research to ignite a renaissance of the European ICT industry, to facilitate or even catalyse market developments while at the same time reinforcing core governance principles
- Demand side embracement of Future Internet technologies, systems, standards and “values”, starting from the so-called smart application domains (or “utilities”) which have high social and public value



- Efficiency Argument
- Value Chain Argument
- Network Economics Argument
- Transaction Cost Argument
- Resource Argument
- Coordination Argument
- Innovation Argument

- **Efficiency Argument**
 - an “Internet economy” which rests on greater transparency of information does not produce a more friction-free economy by better communications between the market actors
- **Value Chain Argument**
 - the concept of Margin (Competitive Differentiator) provides no guidance as to how value is created and no specific insight into how competitive forces and external factors may impact on a firm’s capabilities, its resource allocation and function re-organisation
- **Network Economics Argument**
 - Positive feedback and critical mass are useful analytical tools for utility services

- The network effect of utility services could, *over time*, provide compensation for the initial investment
- The market dynamics of utility services are crucial for the success and sustainability of such a market; there are in principle measures available to steer the dynamics in a certain direction
- Strategies for provisioning of utility services need to be complemented by strategies for “complementary products”, i.e. value added services
- Networked economics may however cause utility services markets to generate various negative effects, including Pareto inferiority and lock-in
- The inherent instability of a utility services market is a critical issue, regardless of business prospects.


However, networked economics does not by itself offer the conceptual tool for creating the initial valuation model of utility services. Additionally, the high probability of abrupt and total market collapse, due to inability to reach critical mass quickly, can be an enormous barrier to investment particularly in the start-up phase.

Specifically for the Networked Enterprise research domain:

The convergence between Enterprise Interoperability (EI) and Enterprise Collaboration (EC) is now taking place in the context of service developments within the gathering momentum of the Future Internet movement; specifically, EI and EC services are one piece in a much broader and wider global picture. Future markets will not sustain these services as isolated offerings.

- ... New business models based on the utility paradigm are in principle possible and should be guided by the quest for the interconnected dynamics of innovation and value creation.
- ... But the Utility Service models such as the ISU are not a pre-determined destination. Its economics are not proven. Indeed, its economic foundations are at this stage uncertain.
- ... The business opportunity of the ISU is not so much about the business opportunity of utility services; rather, it is about the business opportunity of value added services that exploit and build upon the ISU as a utility service infrastructure. In other words, Utility services will almost certainly be bundled with value added services as a viable commercial proposition. This means that Pareto inferiority and lock-in are a real possibility of “natural” market outcomes.
- ... because utility service markets have the intrinsic characteristics of a monopoly, competition in the conventional sense will not be applicable to such a market, nor will competition be sustainable even if “artificially” imposed.
- ... the utility service markets are likely to be dominated by a handful of organisations over time; there is a question about whether commercial interests on its own would be sufficient for ensuring good governance of such markets.

<http://www.coin-ip.eu/news-events/news/saas-u-and-business-models-research-public>



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Interoperability - realised as a commoditised technical functionality, delivered as services, and independent of particular IT deployment - is key to the infrastructure of a new generation of software-based services and applications. That infrastructure potentially constitutes a new level of functionality that forms part of the Future Internet architecture. It is expected to enable new forms and mechanisms of innovation, giving rising to new relationships between supply and demand in the application domain. The above vision underlines the first Grand Challenge of the Enterprise Interoperability Research Roadmap - the Interoperability Service Utility (ISU), which specifically focuses on Enterprise Interoperability and Enterprise Collaboration services [European Commission, 2006/2008].

The FP7/ICT COIN Project has published its interim results on answering the research question: **What is the value proposition for Enterprise Interoperability / Enterprise Collaboration in the forthcoming decade?** The answer is a crucial step for establishing whether there is a business case for offering utility services in ICT, and specifically whether there is a business case for the ISU. The interim results draw 7 main conclusions.

The interim results are documented in the COIN deliverable D6.2.1a, available for download here: [Business Models Research](#). Comments on this document are welcome. Please send your comments to mmsli@icfocus.co.uk. All comments will be considered in the preparation of the final version of the document, expected to be released in Spring 2011. All contributors of comments will be acknowledged in the final version, unless explicitly requested otherwise.



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- Li, M-S., *Future Internet Markets and Business Strategies - An Analysis and a Proposal*. In: T. Luigi, K. Stanoevska-Slabeva, and V. Rakocevic (Eds.): DigiBiz 2009, Springer LNICST 21, pp. 156–165, 2009
- Li, M-S. (Ed.), *FInES Cluster - Overview of the State-of-the-Art Research in Business Models*. 16 Nov 2009. A publication of DG INFSO FInES Cluster, 2010
- Li, M-S., *The Economics of Utility Services in the Future Internet*. In: *Towards the Future Internet - Emerging Trends from European Research*, IOS Press, 2010 (aka “FIA Valencia Book”)
- Boniface, M., Li, M-S., Tuan, T., Cave, J., *The Economics of Information for Citizens, Communities and Commerce*. FIA Valencia SE Session Background Paper, 2010
- Papers linked to this session in eChallenges 2010 Proceedings
- Additional papers under development