

Feb 13 2014

What are the dimensions of the internet?

Blog Editor



On Monday 10 February, **Jonathan Liebenau** presented a synopsis of one of the research themes of our team during the February's [London Enterprise Technology MeetUp](#) held monthly at the LSE. Read here Jonathan's remarks, key questions and possible ways forward of a core theme of our research: understanding the dimensions of the internet and their implications for business, regulation and the digital economy more broadly.

I have long been anxious to answer a set of core questions about the digital economy and especially how business is conducted in the internet industry. Before I could do this I felt it was important to know about the dimensions of the internet. I wanted at least to know:

- What are the boundaries of the internet, and how can we distinguish private networks from the open internet?
- How much traffic passes through the networks, and what are the trends, disaggregated by type of traffic and type of business?
- What is the speed of traffic, both in the experience of retail customers and as regards the internal, core network?
- How many people are employed in the sector, where, and for what tasks?

I thought it would be straightforward enough to find out these dimensions, even if more imaginative research would be needed to learn about those features, such as pricing, costs and value added, that we know well about most industrial sectors.

Once my team and I had [answers](#) for these basic questions, we could go further with address the burning issues that enliven business debates:

- What kinds of business models are likely to succeed in the digital economy?
- What are the labour market effects of changes in digital technologies?
- Who makes money on what, and how are costs most effectively cross-subsidized?
- How is value added in the production of digital goods and services, where, and what does this mean for taxation, GDP calculations and other measures central to public policy making?

However, we didn't get very far.

Cisco measures what goes through their switches, plus a bit more, but they miss out on much and double-count other things. Besides, their way of disaggregating is not always what business and economic analysts need. Sandvine, AskSam, MIT and U. California, San Diego among others measure download speeds and help us understand retail pricing, congestion and truth-in advertising issues, but that doesn't tell us much about traffic moving around the system. So, we [looked](#) for better models of the internet so as to understand these dimensions. Such models are being constructed, slowly. They force us to reconsider old, engineering truths about the way the "layered internet" was supposed to work. They point us in the direction of assessing big trends that are changing the assumptions about how business can be done with the internet, and about its governance.

Some of these [trends](#) are especially indicative and show much about the importance of this kind of research.

- Large amounts of traffic—the majority of what is delivered to devices, is video, and a huge and rising proportion is mobile.
- Data centres are integral to the way the internet works not only because of the prevalence of virtualization and cloud services, but also because they provide the means to structure traffic worldwide. This puts considerable power in the hands of a few big players, including banks, but also Google, Facebook, Amazon and the telecoms, but also Akamai, Level 3 and others in the CDN space.
- The structure changes as internet exchanges and private contracts for peering and transit re-draw routing worldwide.
- Differential treatment of traffic both as a consequence of proprietary practices and by "favouritism" —what we thought of as anathema under "net neutrality".

I am sure that understanding these trends helps us to see deeper into business practices. It helps us to predict a little better. It helps us to establish effective governance. It leads us to a better model that will make it much easier to explore the problems that I had wanted to address at the outset.

Further reading:

Liebenau, J., S. Elaluf-Calderwood, and Karrberg, P (2012) [Strategic Challenges for the European Telecom Sector: The Consequences of Imbalances in Internet Traffic](#). Journal of Information Policy 2: 248-272.

Liebenau, J and Elaluf-Calderwood, S (2013) [Metrics for Assessing Internet Business Models and Sustainability](#). Presented at the 41st TPRC Conference, September 2013.

This article gives the views of the authors, and not the position of the London School of Economics.

[We welcome your comments! Please take a look at our comments policy](#)

About the author



Jonathan Liebenau – *LSE Management Department*

Dr Jonathan Liebenau is a Reader in Technology Management, LSE. He Specializes in fundamental concepts of information, and the problems and prospects of ICT in economic development. Previously worked in academic administration, technology policy, and the economic history of science-based industry, all positions in which he has emphasised the use of information in organizations. He is the author or editor of a dozen books and over 70 other major publications. He has provided consultancy services to leading companies and strategic government agencies, including Dell, BT, IBM, Microsoft, TCS, Nortel, EDS, Lloyd Thompson, and in the UK Government, the Office of Science and Innovation, the Department of Trade and Industry and the Home Office.

This entry was posted in [CAIDA](#), [digital economy](#), [ICT](#), [innovation](#), [internet](#), [internet economics](#), [internet governance](#), [Jonathan Liebenau](#), [LSE Tech](#), [MIT](#), [NEF](#), [regulation](#), [Research](#). Bookmark the [permalink](#).