Diversity of User Experience and Alternative Future Internets

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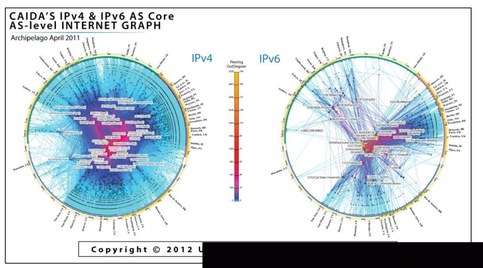
Objective

One of the primary objectives of the ECIR project is to understand what forms the future Internet may take. This requires identification of the levers, constraints, and conditions under which each scenario may evolve.

Current visualizations

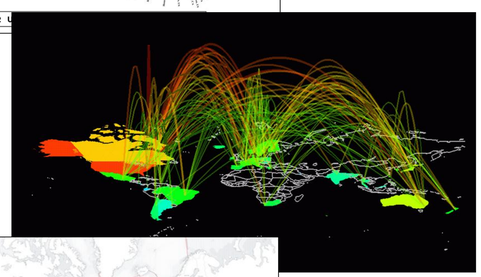
Technologists have mapped the Internet by connectivity, traffic, and even physical fiber. Each method provides different insights into physical and economic structure: who the players are, their relationships, and the depth and frequency of connections. But they do not reveal the wide variation in how people actually experience the Internet.



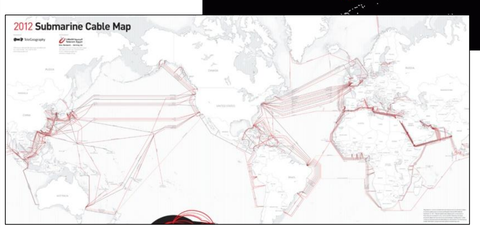
Interconnection

Source: K.C. Caffee, CAIDA

Traffic



Source: Stephen Eick, Bell Labs



Undersea cables

Source: TeleGeography

Diversity of user experience

User experience of the Internet varies greatly globally, and to a lesser extent even domestically. For example, the user map of Facebook looks nothing like the global traffic map due to blocking of Facebook in China and Russia:

Thinking about variation in user experiences requires consideration of language, culture, society, laws and regulations, not just packets, fibers, and dollars.

Each layer of the Internet can impact users in different ways, with increasing specificity moving up through the layers:

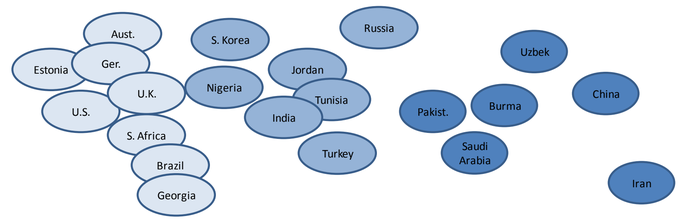
User	• Parental controls • Corporate network restrictions • Online surveillance, intimidation of dissidents
Information	• Censorship: blocking, restrictions on topics, approved sources, takedowns • Copyright and IP laws • Cost, e.g. paywalls
Application	• Censorship and regulation: access • Application design, e.g. Weibo comments vs. Twitter comments • O/S based-discrimination, e.g. iOS and Adobe Flash
Logical	• Reliability • Censorship, e.g. TCP resets • ISP-based discrimination
Physical	• Consumer device used to access Internet • Speed, reliability, and availability of connection • Cost of connection

Assumptions of homogeneity

There is often an assumption that the Internet experience should be the same globally. John Perry Barlow's "A Declaration of the Independence of Cyberspace" denied physical world government had any authority over the domain and declared cyberspace its own domain with its own "culture… ethics… [and] unwritten codes". Yet we know from looking around the world that this is not true. Demanding a homogenous global Internet that achieves the 'open' ideals of the West is unrealistic. Demanding homogeneity without the 'open' caveat requires compromise that would by definition force us to give up some of our cherished values. (e.g. Yahoo! France, Gutmann/ WSJ Australia, Chinese censorship impact on Hollywood movies) It also risks alienating others to the point of disconnecting altogether, as Iran has threatened.

A heterogeneous future

The other possible outcome is a heterogeneous world in which we preserve our values but must tolerate differences we find objectionable in others. This future Internet would take on a core-periphery shape, with dense interconnection between 'open' core states, and a spectrum of more or less interconnection in the periphery. It is possible that clusters will form, with greater interconnection within these clusters than to other clusters, and with some countries becoming their own, largely isolated network..



Source: Freedom House

Future research: What is the future Internet we want?

We should think pragmatically about what a future Internet that would best achieve U.S. interests would look like, and how we can shape the evolution of the current Internet to achieve those goals. This requires asking what our aspirations for a future Internet are, which are achievable alone, and which require international or global cooperation. It also necessitates recognition of inherent tensions in goals (e.g. security-liberty) and discussion of acceptable tradeoffs. [ongoing work]

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