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How we see the Internet

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When we think about the Internet, many of us think about something beyond the technology of the Internet itself. By definition, the Internet is a technical system: a communications infrastructure that enables networks around the globe to interconnect. However, over the past two decades, the Internet has become far more than a technology. With more than 3.5 billion people online today, the Internet is now an integral part of the social and economic fabric of many communities around the world.

Based on the views expressed in the interviews that inform this report, we use the term 'Internet' to refer not only to the technical infrastructure, but also to the entire social and economic ecosystem to which it has given rise.

> **The Internet Society capitalises the term "Internet" to differentiate the global Internet from generic "internets", which can refer to any interconnected group of computer networks.**[1]

Fundamental properties of the Internet

In the history of humankind, few technologies have resulted in such widespread social and economic change in a relatively short period of time. Growing nearly 900 per cent from 400 million in 2000 to 3.5 billion users today, the Internet has had an unprecedented impact on the economy and societies around the globe.

Conversely, the impact of the Internet on society has also transformed the Internet itself. It is no longer just the home of email, static webpages and discussion boards. Today's Internet is so much more. It is a dynamic space for collaboration, commerce and expression. Video currently accounts for more than two-thirds of all Internet traffic in the world, and people accessing the Internet via a mobile device now outnumber those connecting from a computer. The Internet has changed political systems, revolutionised business, and reshaped communities worldwide.

In spite of all this dynamism, certain properties of the Internet persist. These properties, which we call *invariants,* have been the foundation for the Internet since its earliest days. At the same time, it is because of these invariants that the Internet has become such a dynamic resource. These technical properties are at the heart of the Internet's success — they provide users with the ability to fully benefit from the Internet.

[1] https://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet

Internet Invariants

Global reach, integrity

The Internet's routing, naming and addressing service ensures it is truly global. An Internet user can reach websites, email addresses, smart phones or any other Internet connected devices and is able to trust that the information received is the information requested.

General purpose

The Internet has no inherent limitations on the applications and services it supports. The Internet supports more than the World Wide Web and email.

Supports innovation without requiring permission

As an entrepreneur or creator, you don't need to ask permission to create a new service on the Internet. This "permissionless innovation" is crucial to the Internet's success; it removes the barriers to entry. From the World Wide Web to social networking, from BitTorrent to Bitcoins, many of the applications that billions of Internet users use every day were only possible because of this permissionless innovation.

Accessible

There are no limitations on who can access the Internet; all that is required is a connection. Anyone can use their connection to create and share content, but also to attach entirely new networks such as small, local community networks.

Based on interoperability and mutual agreement

The Internet is a network of networks. It works because those networks can communicate with each other, based on open standards for the technologies that support it and through the agreements made between network operators. Jari Arkko, former chair of the IETF, perhaps said it best: "I cannot think of a better example where interoperability is more important than the Internet of Things. Without interoperability, lights won't work with the switches, sensors can't be read by your smartphone, and devices cannot use the networks around them".[2]

Collaboration

The various stakeholders who support the operations of the Internet collaborate to ensure the Internet continues to work, grow and develop. This spirit of collaboration exists even among competitors in the private sector and between stakeholder groups that might not otherwise collaborate (for example, between the technical community and civil society). Collaboration when needed, competition when possible.

Technology, reusable building blocks

The Internet is comprised of numerous technologies that together create the Internet as we know it today. However, each individual technology, or building block, may be used for purposes for which it was not initially developed. There should be no restrictions on the functions of the technologies that comprise the Internet being used for future innovations.

No permanent favourites

The Internet has no favourites. In the 1990s, Netscape and Mosaic were among the most popular browsers on the Internet. Before Facebook and Twitter, MySpace was the dominant social network. Today, more people access the Internet with a mobile device instead of a desktop computer. New technologies and applications often replace older ones, and this is part of the natural evolution of the Internet.

[2] Blog by Jari Arkko, An Interoperable Internet of Things: https://www.ietf.org/blog/2016/01/an-interoperable-internet-of-things

The principles that guide the Internet Society's work

The Internet Society believes that the Internet empowers users with certain *abilities*. These abilities underpin the social value that the Internet provides to people. As we look to the future, these abilities must remain at the heart of the Internet experience for everyone, everywhere.

The ability to Connect

The Internet was designed to ensure anywhere to anywhere connectivity. All Internet users, regardless of where they live, should have the ability to connect to any other point on the Internet, without technical or other impediments. This ability to connect people is essential to the Internet's value as a platform for innovation, creativity and economic opportunity.

The ability to Speak

The Internet's value as a medium for self-expression is dependent on the ability of its users to speak freely. Private, secure and — when appropriate — anonymous communications ensure that Internet users can express themselves in a safe and secure manner. All Internet users should have the means to communicate and collaborate without restriction.

The ability to Innovate

The growth of the Internet is the direct result of the open model of Internet connectivity and standards development. Any individual or organisation should have the ability to develop and distribute new applications and services, free of governmental or private sector restrictions for anyone to use.

The ability to Share

The Internet enables sharing, learning and collaboration. The ability to share has given rise to the open development of the key components of the Internet, such as the Domain Name System (DNS) and the World Wide Web. Fundamental to this ability is the concept of fair use, and the freedom to develop and use open source software.

The ability to Choose

User choice and competitive communications markets result in the availability of better, cheaper, and more innovative Internet-related services. An Internet access environment characterised by choice and transparency allows users to remain in control of their Internet experience.

The ability to Trust

Everyone's ability to connect, speak, innovate, share and choose hinges on trust. The security, reliability and stability of the network, applications and services is critical to building online trust.