Thoughts on the Future of the Internet

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[This was presented as the final segment of a three-day series that focused on Internet abuses, such as cybercrime and spam.]

1. "Futures"

A blemished view well might be the most important lesson for the future: The Internet has – and will continue to – reflect the real world. A world already changed by the Internet, but a world of **people** who remain basically the same.

> Before the Internet became a mass market in the early 1990s, it was like a "small town" - a close-knit research community. Now it is a megacity, with all the dangers that implies.

> Today, more than 1Billion people are **your** next-door neighbors. And just as in the bricks-and-mortar real world, many are aggressive and untrustworthy.

The Internet will have other "more"s – more devices, more services, and more speed.

> I can't pretend to know what those devices or services will be 10 years from now, never mind farther out.

> One prediction I **can** make is that there is a serious danger in thinking that the "more" means "always" and for "everyone", because one guarantee for the future is that there will be another "more" – more diversity. There will always be people and places with poor access, slow speeds, or limited devices. So, to **rely** on having faster and better is to **exclude** many people, much of the time.

2. Past

Let's try to get a little historical perspective – something which we actively ignore in the U.S., but that folks, here, in the UK seem to respect rather better.

> The Internet has been international from its earliest days, including the considerable contributions of Peter Kirstein's research group at University College London.

> Another pioneer, Jon Postel was my office mate, at UCLA while he finished his doctorate. One day in 1972, our entire department went off on a retreat, away from campus. As we waited for the bus outside the engineering building, some folks muttered that they'd like to go back to their office to get more work done.

Jon Postel turned to me and casually commented that it would be nice to have some sort of access to the net from where we were outside, and that, one day, we'd probably be able to sit on a mountain top, contemplate nature, and trade emails.

At the time most people would have thought his idea crazy. Yet today it's a regular occurrence.

3. Forces for change

For the first 20 years of the Internet, we had only a small, unchanging set of services. New **applications** did not begin to appear until new **people** began to participate.

More people mean a mass of creators, not just a mass of consumers. And only a few ideas have to succeed to make a difference.

The Internet is creating other forces for change. Having a billion neighbors makes it easy to support smaller, niche markets. This means that many, new cottage industries can thrive.

The history of the Internet gives us many examples of an evolutionary process that goes beyond simple incremental improvements, to include higher-level abstractions based on seeing how things get used:

One of those original applications was the File Transfer Protocol, FTP. A special convention let it be used for access to "public" files on remote systems. It worked well-enough for our small, technical community. But it was not exactly user-friendly for a larger population.

As the Internet grew, people experimented with other ways to access content. For several years, the leader was a system called Gopher – but how many of you, today, have even heard of it? It was technically much simpler than the Web, but the content was not nearly as rich.

Indeed, creating the right mixture of interesting features, with simple use, is the classic challenge for making successful products. Often, the individual components are not new. The way they are **assembled** is what creates the magic.

A second line of exploration from FTP use, was due to the explosion of documents that were suddenly available. How to find the right one?

The first search tool was called Archie. Wildly successful, 15 years ago, it too is virtually unknown today, having been replaced by the likes of Google andYahoo.

Again, different people, pursuing different experiments, evolved their work until some came to dominate… For awhile.

4. A bit of fun

I'll end with a fun, specific vision that cropped up in discussion recently and is entirely feasible. It is based on the popular idea of what is called "peer-to-peer" networking.

> When I was driving – as we do so much in California – I was worried about the traffic a few miles ahead. My passenger noted that the information I needed was already known by cars driving ahead of me.

> What if phones and cars themselves keep track of their current environment, such as location, speed and direction, and they freely exchange that information with neighboring devices, such as those traveling in the opposite direction.

> When these "intermediary" cars pass mine, I can ask them about conditions up ahead.

> For those of you interested in the idea of openly contributed information, such as the current Wikipedia, think of this dynamic, community **driving** resource as **traffi**pedia.