

The Tech Lab: Paul Twomey

Dr Paul Twomey, president of the internet admin body I cann, talks about the net's potential for change.

In a time of gloom I am an optimist. There is a tide of innovation sweeping the world. Those concerned about how to counter recession and poor financial system transparency should look at how the rapidly globalising internet is changing how our world works.

While the web has changed our lives, we are but on the edge of a transformative revolution which will change both developed and developing countries.

The mobile global internet is growing quickly to connect billions of people, devices and things. It offers much greater productivity and lower barriers to entry for users and businesses.

In my travels I see "suits" in Manhattan, shop owners in Hyderabad, tour guides in Luxor, students in Santiago del Chile, Aboriginal artists in Alice Springs, fisherman in Hoi An; all glued to their handsets and the net.

This empowerment of individuals, especially in the developing world, is transforming social, economic, and political relationships.

" The implications of the rapid penetration of the internet are staggering "
Paul Twomey

At a time of financial crisis, when all are calling for transparency and good governance, the internet economy's feedback loops should be grasped, transforming the way we think of currency and accuracy of information and to change how we develop policy and make decisions.

But we also need to stay alert to the forces that may contribute to the fragmentation of the global web.

Most internet users today will have had their first interaction with this phenomenal communications platform in the mid 90's, following the advent of the HTML and the World Wide Web.

My first encounter with the internet was in a crowded network operations centre, at the Australian National University, in 1991. I remember thinking, someone is going to turn this into a tool for average people and unleash all sorts of economic opportunities.

The next year Tim Berners-Lee and Robert Cailliau developed the Web and did just that.

Despite the obvious promise then, few would have envisaged that in such a short time, the internet would come to play a crucial role in international commerce, communications, government, education entertainment, and delivery of services.

And this is only the beginning.

While we are offered glimpses of how the internet might evolve in the coming years, the last 30 years has taught us that we probably haven't yet imagined the long-term impact of the global internet on society.

New worlds

Having said that, it's already clear where the next wave of internet growth and innovation will come from. It will come from the world's developing economies, and it won't even be reliant on access to personal computers.

Worldwide, we're seeing an unprecedented expansion of internet networks, driven most recently by convergence with mobile communications.

This represents a revolutionary shift in the provision of information and empowerment to individuals throughout the world. Ten years ago, 100 million people used the internet. Today it is 1.4 billion.

By the end of 2010, 5 billion people will have a mobile phone. Many of these will be internet enabled.

The consequence of this growth and convergence is an enormous democratisation and devolution of decision-making throughout the globe, especially within the developing world. India alone has a handset uptake of 9 million per month.

The expansion of mobile networks, combined with the latest smartphone and other internet enabled devices, are enabling developing economies to leapfrog traditional technologies and remove barriers to entry to the global economy for their citizens and businesses.

Married to the introduction of new generation operating systems, like Google's Android and the iPhone, this mobile internet revolution is going to greatly expand the commercial, social, and political feedback loops which the internet enables and fosters.

This is transformative for the way governments and companies need to consider how information is gathered, analyzed, and acted on. In a truly networked world, decisions need to be made on real time data, reflecting network effects of complex "eco-systems". Imagine Facebook meets the national bureaus of statistics.

This revolution is particularly important for the services sector of the global economy. As Alan Greenspan noted in the 1990s, the first major impact of the internet in the US economy was in helping to drive down inventories across the supply chain in goods.

The manufacturing and retail sectors have continued to use these networks to enable greater transparency of information across global trading networks; hence, spurring continued globalization, lower costs, and economic growth.

The services sector has not been as agile. Indeed, in major parts of the professional service sectors, health care, and government services, the full promise of information flows across fully networked sectors has not yet been achieved. This should be a major focus for policy makers considering about how to get the full economic benefits from the growth in data networks.

Growth pains

The implications of the rapid penetration of the internet are staggering. If current industry estimates prove correct, there will be 1.5 billion new internet users in the next two to three years - just over double the number of current users.

And these networked ecosystems will not just be human. We are moving into a realm of the machine-to-machine internet.

The introduction of Internet Protocol (IP) version 6 into common usage means that the address space available to connect devices to the net is growing from 4.2 billion with IPv4 to 340 trillion, trillion, trillion addresses. With pervasive wireless connectivity, this means everything can talk to everything.

Car and aircraft manufacturers are already preparing for components to be tracked and provide performance reporting through the Net. Such a pervasive public internet will also support private trading networks, using Radio Frequency ID technology, for tracking physical objects through the supply chains of the world.

While the internet unites people, the very nature of its rapid expansion has produced stresses that threaten to fragment it. One force for fragmentation could be political, whether motivated by cultural norms or fear of dissent; it is essential not to confuse the content debates with the underlying global addressing and routing system.

Another stress could be linguistic fragmentation. Here the role of Internationalized Domain Names is essential to ensure a globally unified Domain Name System, while enabling linguistic localization. There are also technical and business drivers.

The boundary between the traditional PC-based internet enjoyed by 1.3bn people (largely in the developed world) and the mobile communications (used by billions in developed and less-developed countries) is still somewhat ragged.

We need to ensure that carriers or device manufacturers do not impose "walled gardens" that block users

from the benefits of the "innovation at the edge" model of the internet.

Despite these concerns, I remain hopeful that with appropriate attention by leading governments, business and civil society these forces can be managed.

In the coming years, it is going to be vital that we avoid fragmentation and maintain a single interoperable internet. To achieve this, network expansion must continue in order to spread the benefits more widely, and the internet's tradition of coordination of technical evolution among multiple stakeholders needs to be maintained.

Corporate or governmental attempts to control will stifle innovation and entrepreneurialism and risk fragmentation.

The internet has proven to be a deeply transformative technology in the developed world, as so it will be for the developing world.

It will be an economically important tool that will provide a mechanism for the development of new business models, previously unknown ways connecting people and communities, new possibilities for the delivery of services, and a feedback loop for the population.

In the midst of economic crisis, companies and governments should not underestimate the formational impact of a globally ubiquitous internet will have on the post-recession world. Their agile competitors will not.

Imagining the future of technology

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