

## **Hossein Eslambolchi: The top 10 trends for the next 15 years: – and why they matter urgently**

*THE COMMUNICATIONS* industry is undergoing a massive transformation. It is so fundamental, it will affect every person and every business on the face of the planet in the next 10 to 15 years. You can look at it as the third wave, comparable with the way railroads, automobiles, and planes transformed life in the 20th century.

Every application of BSS/OSS will move from legacy to one global, virtual, seamless IP world, based on IP and wireless. The Internet that emerged as a mass medium in the 1990s wasn't designed for this and at the moment we're only applying quick fixes. We need networks and an Internet that are designed for sextuple play – that is quadruple play (phone calls, broadband, IPTV, and mobile), plus sensory-based services (for example, applications in medicine and construction), plus financial services.

These two new categories cannot tolerate latency in the networks, nor packet loss. Real-time and reliable are the key words here. We need to be thinking now how we change the Internet to support these types of functions. The thinking in the 1990s was that the core network should be dumb, with the intelligence around the edge.

### **Figure 1: Top 10 Technology Trend**

1. IP networks must be ready for sextuple play, including wireless services
2. Security requirements must move from reactive – defensive – 3P model (proactive, predictive, preventative) onto the offensive – otherwise there will be problems of biblical proportions
3. All future IP services will be designed for three screens – mobile, TV, and PC
4. Wireless Internet access will be big – driving better modes of mobility with Wi-Fi and 4G/5G achieving explosive growth
5. Sensor networks will proliferate – machine IP addresses will overtake host computers
6. Video requirements now drive IP network design
7. Broadband wireless will be common – locality is now important for presence and advertising – not routing
8. Cloud network capacity and cloud computing will replace static resource provisioning – the concept of none will mean plug and play networks in the future
9. Privacy becomes consumers' biggest concern as technology gets closer to realizing services as seen in the movie *Minority Report*
10. Next gen speech recognition and natural language understanding will redefine the human machine interface

This was a big move from decades of engineering, where the intelligence was in the core public switched telephone network, and the end devices were dumb – corded and cordless phones. This was a kind of IP bigotry, and it was clear to me that we would be storing up security problems of biblical proportions if we followed this line of thinking.

To my mind, the best solution was intelligence in the core and at the edge in the form of smart devices and, over the last decade, this has happened with the great proliferation of smartphones which are getting cheaper and becoming available to more and more people all the time. This too has introduced more security issues: attacks on networks used to be against the core and Microsoft Windows, now criminals are targeting Apple and apps.

Cyber crooks have become more sophisticated in other ways, too. The code they used was sloppy and it was a kind of carpet-bombing approach. Now it's more like stealth fighting; the challenge is to detect what's going on and the only way we can do that is to deploy technologies like deep packet inspection.

We haven't yet seen any indication of the real force of cyber warfare that we are going to face, where personal information is the target. We live in a world where Apple is offering 300,000 apps, there are



My objective is to help operators become more profitable in sustainable ways. If they do not take these issues on board, they will be left with nothing but infrastructure. They need to move away from thinking about themselves as primarily infrastructure providers and instead see themselves, and act like, software companies. Right now, they haven't got the expertise to do that. They need to address that issue urgently, laying the foundations for what's coming now.

In the 1990s, operators concentrated on data mining. Since the turn of the century they have focused on business intelligence, based on that data, but it is not generated in real-time. They need to move on, to build knowledge from their many sources of intelligence, in real-time, otherwise when a major virus hits the computer, it's game over.

Finally, at the moment, 50 million terabytes of traffic are generated every day (50 exabytes). We are already getting to the stage where databases are getting bigger and bigger, and eat up storage. We desperately need to come up with ways of compressing data while preserving its information value. Again this is a source of great concern that will soon become a pressing problem. *Copyright Prespectives@2011*