A LETTER FROM THE DESK OF THE CTO

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We live in turbulent times.

This is hardly news to any of you in the communications field; we all know colleagues who are out of a job and looking for work.

None of us can escape the changes in our industry. With this in mind let me review the catastrophic last couple of years, and then introduce a series of articles to appear in future issues of this magazine which will give unique insights from technical leaders of the world's leading telecommunications companies about where our business might now be headed.

John McQuillan of McQuillan Ventures has pointed out "The collapse of the telecom industry has taken on historic proportions. *The Wall Street Journal* recently reported, in a front page article, that over half a million jobs have been lost in telecommunications. This dwarfs the remarkable industrial declines of steel and autos in previous decades.

"This disintegration is even more remarkable for its rapidity. It took two decades for the auto industry to shrink by a comparable amount to the shrinkage in the telecommunications industry in just two years.

"*Fortune* magazine's Global 500 for July 2002 listed 11 telecom companies among the top 25 money-losing businesses in 2001. Topping the list was Nortel, with a $27 billion loss, followed by Vodafone with a $23 billion loss and Lucent with a $16 billion loss. All told, the 11 firms lost $107 billion in 2001."

The epicenter of the problem was the service provider sector. A recent tally at www.convergedigest.com listed 67 major telecom providers that have entered bankruptcy. Of 330 competitive local exchange carriers challenging the Baby Bells at the end of 2000, now there are fewer than 80.

Columnist Peter Sevcik of NetForecast has said "The fundamental Internet structure is in a financial crisis and more than half of the U.S. national backbone capacity is operating under bankruptcy protection."

What happened?

Well one thing was that there was a feeding frenzy; large companies sought scale and new technology by buying smaller companies. This frantic merger and acquisitions activity, together with careless governments sucking huge amounts of money out of the industry by auctioning spectrum, caused debts of over $470 billion.

However, when the market returned to some level of sanity, more than $2 trillion had been lost by investors. This represents over 60 percent of its value at its peak being lost. And of course we know many companies who have done far worse than this average.

The second driver that tipped the industry over the edge was the behavior of some industry leaders who indulged, certainly in the United States, in overhyping the benefits of the Internet Protocol and its rate of growth. Indeed some were gloating over the 900 percent per annum growth rates of IP traffic, and when other carriers, not to be outdone, gave out similar messages to reassure their shareholders of their competitiveness, it caused a scramble to spend capital on too much bandwidth by too many service providers.

The market departed from fundamentals during this crazy period and convinced itself that share prices had to reflect growth and not value, so causing share values to soar, and this allowed newer companies like Quest and Worldcom to buy much larger, cash rich companies, such as US West and MCI.

Of course with hindsight we can see that a correction was bound to happen, so if market forces are allowed to operate without interference from regulators, there will be some consolidation in the industry, and pricing power will return to the remaining service providers.

It is sadly ironic that an industry that geared itself for 900 percent growth will face a tremendous challenge, now that the service providers are burdened with huge debts, in meeting 50 percent growth when the glut is consumed.

The natural reaction of the service providers has been to cut capital spending, and this fell by 25 percent in 2001, followed by a similar fall in 2002. The huge fall has brought back the pre-2000 overspending departure from the historic trend curve to a level more consistent with the first half of the '90s.

Such a "bubble" in capital expenditure (Capex) does great damage to suppliers; they gear up to increase capacity, and when turnover and profits fall, the market punishes their share price excessively. And this ripples down the food chain to the smallest suppliers.

The onset of this Capex bubble caused the major telecommunications suppliers to behave in ways they had not done before. Led by Cisco, companies such as Nortel and Lucent began acquiring technology rather than growing it internally. This took on a life of its own as startups were bought out long before they had reached profit. Larger companies mimicked each other when they saw that the market was rewarding those that kept up with new technology by buying it rather than creating it.

This in turn saw many of the most talented technologists desert the companies who could only (at that time) offer them security of jobs, and move to or found startups. This was easy to do with so much money from venture capitalists chasing so few real business propositions. The damage that this has done to the creation of intellectual property will take some time to determine. In 1999 and 2000 alone, over 700 network infrastructure companies got started. But facing this extraordinary liquidity crunch, many have run out of money and shut their doors, while the majority will run out of money in the next 18 months.

So what does the future hold?

The Communications Society has invited the technical leaders of our industry to contribute their views and how they see the prospects for the telecommunications business from the perspective of their position as CTOs of large service providers (and large spenders). They have been invited to write about whatever they believe will throw light on our industry's future such as the impact of technology, regulation, and the economy.

I am delighted to announce that starting with this note there will be a contribution every other month from the world's most senior technologists and business leaders from the world's most influential service providers. For example,

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effectively creates a tunable receiver without using tunable filters. This functionality is enabled by Network Photonics CrossWave all-optical switching technology. The resulting ROADM subsystem achieves extremely low cost per wavelength and allows high-availability network designs without using expensive tunable filters.

■ www.networkphotonics.com

CWDM Chips

Axon Photonics

Axon Photonics, a designer and manufacturer of planar waveguide modules and chips, recently announced the release of its 20 nm 4-channel CWDM chips. These CWDM chips are fabricated using silica-on-silicon technology to facilitate the hybridizing of LD and PD chips, making them an ideal choice for metro or Ethernet applications.

The CWDM chips are available in standard wavelength plans in both mux, demux, and integrated mux/demux versions. Both the mux and demux chips feature low insertion loss of < 2.5 dB. The demux chip features high isolation of > 40 dB.

■ www.axonphotonics.com

Next-Generation Testing Platform

Sunrise Telecom Incorporated

The Scalable Test Toolkit (STT) from Sunrise Telecom is a next-generation testing platform designed to meet the challenges associated with the design, installation, and maintenance of core, metro, and access networks. The STT integrates DWDM analysis, fiber cable testing, SONET/SDH testing up to 10 Gb/s, and Ethernet testing. The STT's platform modularity ensures that testing capabilities can evolve with the ever-changing communications network, protecting the user's investment for years to come. The STT's patent-pending stacking architecture offers unmatched flexibility, including the capability to operate test modules independently from the platform.

■ www.sunrisetelecom.com

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the list of contributors this year includes Hossein Eslambolchi of AT&T, Mike Walker of Vodafone, Fred Briggs of Worldcom, Yuji Inoue of NTT, and Ross Ireland of SBC. These will be followed by an equally illustrious list of contributors from around the world.

In many cases, due to geographical differences in approach, these contributors are not designated chief technology officer, a title commonly used in North America, but in each case they are the R&D leader of the company and its most senior technical businessman.

I am indebted to some of the leading analysts of our industry for much of the material in this article, including John MaQuillan, David Passmore, John Ryan, and Peter Sevcik.

ABOUT THE AUTHOR

Tom Rowbotham has been head of the Laboratories of British Telecom worldwide, founded Concert the BT/MCI joint venture, is or has been on the Boards of seven companies, as well as the Board of ComSoc and the IEEE itself. He is now a partner in a venture capital firm, St Paul Venture Capital, is based in Boston, and is the winner of the IEEE Frederik Philips Award for 2003, the top IEEE award for leadership in R&D in any field represented by the IEEE.