Take off share price blinkers

Stewart Fist, Crossroads

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EVEN after its extraordinary profits in the worst year for telecommunications in living memory, the idea of propping up share prices by dumping engineers and technical staff and replacing them by outsourcing still appears to be high on Telstra's agenda.

Back in January, Ziggy was telling journalists that staff levels would be cut by another 6000 by selling off the Network Design and Construction (NDC) arm. And, in a way, his management decision was right - if you look at it only from the share price perspective.

Network design and construction companies have collapsed around the world this year.

Optical fibre has been ridiculously over -built, and now no carrier in its right mind wants to spend more money in this way. So, to avoid sacking staff, the best ploy for Telstra was to package them into a subsidiary corporation and flog the lot off to some sucker with a dotcom gleam in their eye.

That's if you look at the problem only from the share -price perspective.

Last year, while Tim Besley, the chairman of Leighton Holdings was presenting his report to government about service quality in the bush, Telstra decided to slash its outsourcing budget for copper upgrades. Leighton was to have earned $338 million of this, but Telstra cut back the overall budget by 80 per cent.

Leighton was also the front-runner to buy NDC for a suggested (by Telstra) price of $1 billion, but the Leightons chief executive called Telstra's advisers and merchant bankers "propeller heads" over that valuation.

Currently, Telstra seems content to wait for the next bull market and natural attrition to get out of the NDC impasse, because no -one else wants to get lumbered with the problem.

Of course, these world-class engineers could be put to work upgrading and improving the network using some of those excessive profits, but I guess that's just a bit too easy.

A lot of people, and certainly many politicians, tend to believe telecommunications equipment can be bought off the shelf, installed and left to run by itself to just generate the odd billion or so in profits.

But that's not the way good networks are built or maintained, even today.

Cellular phone networks, for instance, are dynamic. Technicians constantly need to change transmitters and their frequencies, and to modify the antenna system to manipulate cell -coverage areas.

With radio systems you've got to tweak the alignments constantly, which is why wireless local loop has never managed to get a foothold where copper wire already exists.

It's the same with television transmission, especially now the old separation between the analog channels has disappeared.

Until recently there was always a clear 7MHz separation between channels on the dial to ensure that the sound frequencies from one didn't leak in to the video of the other.

But no more.

And this is creating major problems in some areas.

The politicians decided not to use Australia's spare VHF channels (11 to 27) for digital transmissions because that would open up extra channel space to media competitors.

So, instead, they gave the existing television networks access to the old taboo, adjacent channels for their digital services.

That's why you are probably seeing interference on your television. With broadcasting and telecommunications, a healthy staff of technical experts and specialist R&D engineers is always needed to handle day-to-day problems and the unexpected.

Companies can't just rely on equipment makers or outside experts if Australia is to have optimal services.

That's why the downsizing and downgrading of the Telstra Research Laboratories (TRL) is a national tragedy.

Over the years, TRL has done marvellous work in solving what, on the surface, often appeared to be relatively mundane problems.

But simple problems can cost network providers millions of dollars if they aren't addressed quickly and intelligently. And in our big brown, dry continent, there are unusual problems caused by local flora and fauna.

Telstra's long-term battle with the rampant, parasitic West Australian christmas bush is fairly well -known. No other country in the world has a tree that wraps its roots around optical -fibre cable and tries to suck out the glass.

But you may not have heard about TRL's success at locating microbends in fibre. In fact, you probably didn't even know microbends existed.

The problem is that the earth is not stable -- as anyone owning an old brick home built on clay soil will attest.

Outside the ducted suburbs, optical fibre is buried in earth, and the fibres run into problems with expansive soils pressing sideways and vertically on the cables.

The problem is that the fibres are bunched around a core, which, in cross-sectional view, looks like a small gear-wheel.

The fibres sit in the gear slots, and are thereby protected from accidental damage.

Cables are often made with loose fibres, but if the glass moves too much it can rub and abrade, and quickly lose its light-transmission capabilities.

With only a few microscratches a fibre will be rendered relatively useless.

The alternative is to fill the core with a gel that acts as a physical buffer and lubricant, and also blocks the penetration of water. With its hydrogen ions, water is another contaminant that super-transparent glass can do without.

Gel-packed fibre cables, however, suffer from one major failing. When the earth moves, pressure is transmitted directly to the fibre, producing these microbends.

Laser beams suffer higher losses at this point and the engineers then need to physically locate the bend and dig down to reduce the pressure.

But how do you find a microbend in 30km of underground cable in the outback?

By using an instrument called an Optical Time Domain Reflectometer (OTDR) that sends light pulses down the fibre and picks up any back-scatter from pressure points.

Theoretically, by measuring the time it takes for the scatter to return, they can calculate the distance, but in practice they can only do this roughly. All gel-filled cables will have some minor bends, so the location of the problem is hard to identify among all the other confusing distance readings.

So TRL devised cold-clamp.

They dig down to the cable somewhere near the fault and freeze a 30cm length with liquid nitrogen. This temporarily introduces fairly hefty microbends into the cable, which can be easily identified and measured, and this gives a reference point that enables accurate calculation of the fault distance.

Such clever, but essentially simple innovations, aren't likely to be developed by any outsourcing, for-profit, research laboratory because there isn't any money in it.

A commercial lab would focus on improving the accuracy of the meter to have some improved equipment to sell.

I'm not knocking the need for meter improvements, just pointing out that cold-clamping provided a simple, cheap and practical solution to the problem, which is why we need both commercial and non-commercial approaches.

Another, similar TRL development was trenching and laying fibre-optic cable without needing a steel strengthener.

To cover long distances, network engineering companies around the world use large bulldozers fitted with a trencher. They go down about 1.5m and the cable is dragged from very large and heavy reels as the dozer moves forward.

But the fibres themselves can't be placed under strain because they might fracture, and stretching increases the potential for microbends.

For this reason, most cable has a steel wire in the core to take the strain. But in big, dry, flat Australia, this wire became the favourite dissipation path for lightning, which carried its charge back to the nearest electronics.

The problem is that dry soil is not a good lightning conductor and without nearby mountains, summer thunderstorms tend to hit the earth along tree-lined country roads, where country cables tend to lie. The TRL eventually developed a feed mechanism for the cable reel which takes all the tension off the cable.

With this technique, it became possible to lay cables made without the steel lightning conductor. It was a major breakthrough.

Of course, you can't escape having a conductor in the ground where copper wire is used for local distribution, but Telstra also pioneered the use of a stainless-steel conductor wire about a hand-span above the copper in the trench.

This is reduced country-exchange equipment losses through lightning hits.

Then there are the white-ants that think plastic insulation is a breakfast treat, the Queensland bush rats that chew cable as a last resort in drought times, and our indigenous cockies (the feathered kind), which like having parties around outback microwave dishes and amuse themselves by pecking away the weather protection shields.

That's why we need an indigenous problem-solving laboratory, and not subject the research labs to cycles of support based on the current Telstra share price.

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