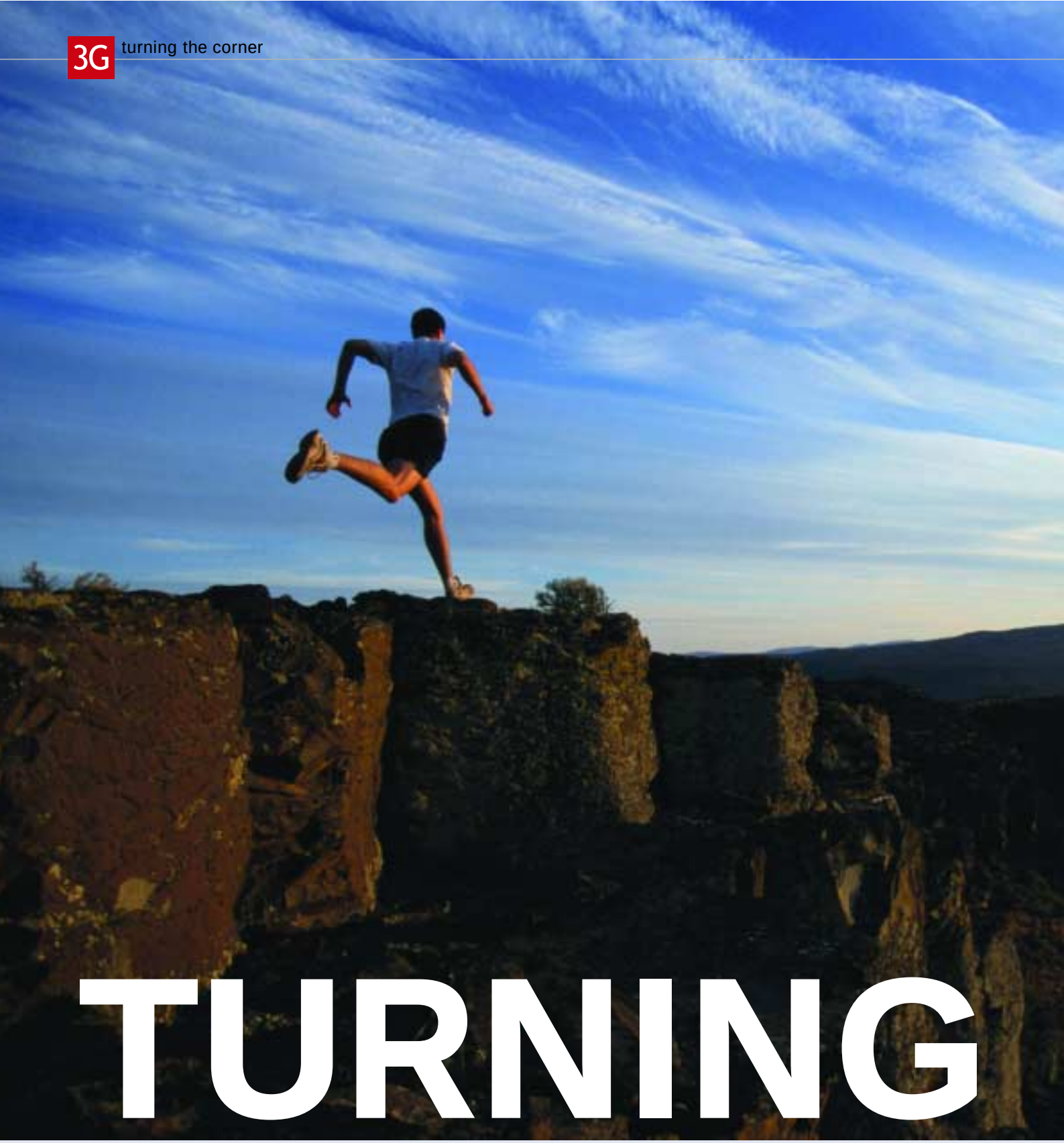

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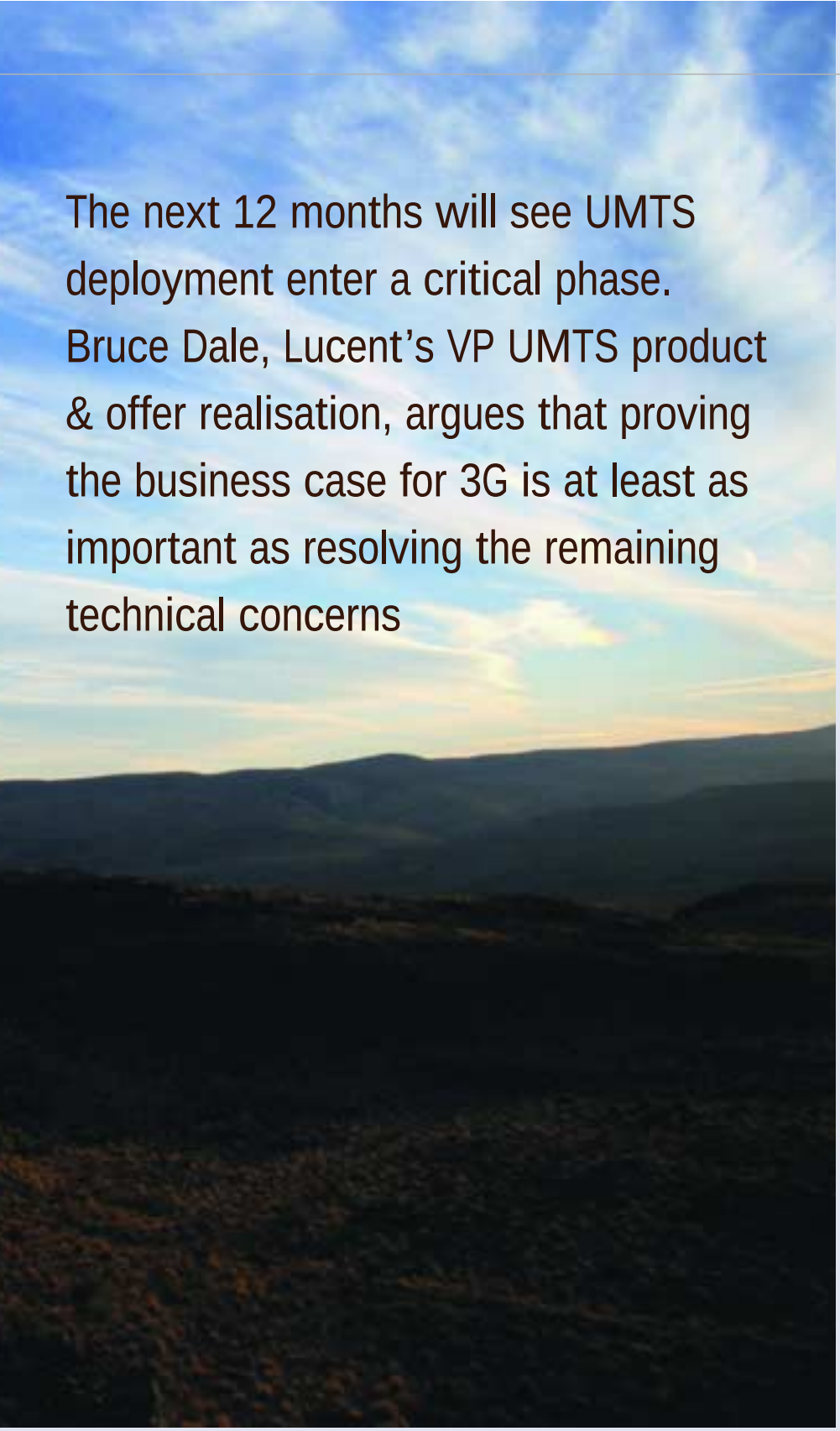

The next 12 months will see UMTS deployment enter a critical phase. Bruce Dale, Lucent's VP UMTS product & offer realisation, argues that proving the business case for 3G is at least as important as resolving the remaining technical concerns

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3GS: ***When Lucent talks about 3G is it talking about technology or services?***

BD: We're undoubtedly fascinated by the complexities of spread spectrum technology – which is understandable, given that they've taken our engineers and scientists the best part of a decade to master. But right now the technology means very little without a strong service proposition. Our 3G launch strategy is focused on demonstrating to operators that there's a business case for high-speed data and proving to enterprises that mobile high-speed data is an effective productivity tool for business.

3GS: ***Are there different perspectives on 3G in the US, Asia and Europe?***

BD: Without question each of those markets is in a different space. The US is predominantly CDMA – which is the same fundamental technology we use in UMTS – and right now CDMA technology is ahead of UMTS by a year or so. This means US operators can already deploy first-stage 3G services. For a while now, they've been able to offer high-speed mobile data services to enterprises. ▶

"The technology means very little without a strong service proposition. Our 3G launch strategy is focused on demonstrating to operators that there's a business case for high-speed data."



Bruce Dale: No dramatic shift of balance between CDMA2000 and UMTS

Asia from a UMTS perspective is behind Europe. We expected that. We knew UMTS would be born in Europe and move out. But of course, with the delays around UMTS deployment, it has given CDMA opportunities in Asia that it might not have had. So we're seeing a little more uncertainty in Asia. The UMTS delays are evidently causing some operators to rethink the situation. But we still believe we won't see any dramatic change in the balance between CDMA and UMTS over time.

3GS: ***With high-speed data services up and running in Asia-Pacific and the US, there's a sense that GSM operators are falling behind their CDMA counterparts. Why isn't GPRS taking up the slack?***

BD: It all comes back to the technology. GPRS is based on 2G GSM technology. The reason the GSM community went for UMTS in the first place was because it recognised the value of spread spectrum technology. GPRS is a good attempt at providing data services over a 2G technology that was designed for voice. Clearly there are inherent limitations in what you can provide with GPRS in terms of data rates, the trade off between voice and data capacities and so forth. UMTS and CDMA 3G were built from the ground up for voice and high-speed data. So it's unsurprising GPRS is not in a position to compete with the first stages of 3G CDMA. It's now down to the trade organisations and vendors like Lucent to move fast and convince our customers of the UMTS business case. I think that's what the next 12 months will be all about.

3GS: ***Does GPRS still stack up as a safety net for the early days of UMTS deployment when there are only pockets of 3G coverage?***

BD: Maybe. But the fact is anybody who has been used to GPRS is going to swoon when they experience UMTS data rates. It's like night and day – UMTS is really very significantly better. GPRS might work as a temporary stopgap. But as a customer, if I've got used to high-speed data services over UMTS and get handed over to a GPRS network, I'm going to experience a very significant difference. Now, is that better than a dropped call? Well, it does provide some sort of a safety net, but hopefully only a very temporary one because I don't think customers will like it.

> **"Anybody who has been used to GPRS is going to swoon when they experience UMTS data rates. It's like night and day – UMTS is really very significantly better."**

3GS: ***Would operators have been better avoiding GPRS altogether?***

BD: I don't think any European operators could realistically have made that choice. Remember, everyone was expecting to go commercial with UMTS in 2001. Then when it became clear the technology couldn't support those timeframes, APRU was falling, markets close to saturation and competition fierce, how could an operator not go to GPRS? Which is unfortunate, but the fact is operators couldn't risk leap-frogging GPRS because there was nothing else available to them when they had to make the decision. To have ignored GPRS altogether would have seemed irresponsible – to give your competitors that kind of advantage over you in that kind of a marketplace – it was just too dangerous.

3GS: ***UMTS is late by anyone's timescale. What's the problem?***

BD: First, we saw a great deal of euphoria over UMTS potential and that led to a lot of unrealistic expectations. spread spectrum technology is not easy to master, and even with Lucent's unparalleled CDMA background, it's still a tough nut to crack. When you think about it, what was required here? New base stations, new handsets, new controllers, a new SGSN and so on. The fact is, UMTS development was not as much an evolution from GSM as the originators had hoped.

3GS: ***To what extent has any part of UMTS development been a direct evolution from GSM network architecture?***

BD: From an operator's perspective, the only piece of the architecture that could be described in terms of

evolution is the mobile switching centre (MSC). All other network elements are new, which means lots of difficult and complex development and expensive deployment costs. The technology was never going to be in place the year or so post-licence auctions that people were promising. That was just a false expectation.

3GS: ***But it's not just the infrastructure that's held things back, is it?***

BD: Right. Again from an operator's perspective, once you're convinced the infrastructure works, then the next question is when will the handsets interoperate with the different infrastructures? The last thing you want to do is start a service with a handset that you're going to have to change later. This is the kind of stopgap that irritates customers, irritates operators and is very expensive. It's especially important in Europe that you're able to roam seamlessly from one country to another. If I have a handset that works with Lucent's infrastructure in Germany but doesn't work with Nokia's infrastructure in the UK, that's just not acceptable. So operators want to know handsets are available in volume and that they all interoperate with different infrastructures. Right now, we're just not there and, frankly, I don't think we will be there until probably the end of 2003. If I were a European operator, I wouldn't be thinking about a large volume deployment until at least Q4 2003, maybe later.

3GS: ***Given the economic climate, aren't deployment timelines also about convincing investors?***

BD: The big priority at the moment is convincing operators, analysts and the financial community that there's a valid business case for UMTS deployment. Rolling out these new networks is a fairly expensive proposition. The business case certainly can't be based on voice. Voice can be delivered with GSM and delivered cheap. If all I need is voice, I don't need UMTS.

> "Lucent has focused on proving the business case [for UMTS] through the deployment of pilot networks. It can be verified without a full scale rollout."

So there's got to be a new and compelling business case. And given the history that we've been through with WAP and GPRS, it can't be based on wishful thinking. Because of the investments involved, neither operators nor investors are going to be convinced by market surveys and PowerPoints. Which is why Lucent has focused on proving the business case through the deployment of pilot networks. The UMTS business case can be verified without a full scale rollout. I think this is the smart approach for European operators in the year ahead.

3GS: ***What are the key technical issues that need to be overcome to make UMTS a commercial reality?***

BD: Once again, handsets remain the big stumbling block. A UMTS handset has roughly ten times the processing power of previous generation devices. The whole issue of getting that handset to a proper size, with the kind of battery capability people are used to, is a significant challenge for the handset vendors. Remember a UMTS device is covering both high-speed data and voice, so think of it as a 2G phone plus a PC – all in something that's small enough to put in your pocket. That's pretty tough.

From an infrastructure perspective, the standard is much more prescriptive and descriptive than previous standards we've dealt with. This means it has a lot more options and combinations of features than in previous generations. And these considerations create significant complexity in the radio network controller (RNC). In addition, functionality that was in the switches, higher in the network, has been brought into the controller with UMTS. This means more lines of code, more complexity in the RNC.

3GS: ***Recently, a number of high profile financial commentators have suggested that European operators are stuck with the wrong technology. Is the GSM evolution path holding them back?***

BD: No, of course not. GSM has been an astonishing achievement and it's GSM's strengths – in terms of the standard, in terms of facilitating seamless roaming – that have brought about such amazing levels of penetration in European markets. I don't think it's the technology that's hamstrung Europe's operators. I think as much as anything it's been the financial situation.

Firstly, the boom and bust environment complicated the picture quite a bit. A lot of operators took on a great deal of debt for acquisitions and so on, followed by massive investment in licence fees. Then the downturn came along and now they are being asked to invest in new networks that they know are critical to retaining and building

market share. That's the unfortunate aspect of the European experience. I think time will show that operators made the right technology choice and that three years from now the delayed rollouts and questions about the technology will all be forgotten.

3GS: ***We touched on standards. Are UMTS standards too rigorous? Is life easier for CDMA2000 engineers in Asia and the US?***

BD: There's probably a little more room for vendors to innovate within the CDMA2000 standard. But remember, you can't sell a network to an operator unless you can show that handsets A, B, C and D all work with your infrastructure. So your ability to innovate is still limited even in CDMA2000. I think in general the UMTS standard has worked out very well. We've been able to take the standard, reduce it to practice, without any serious problems. It's a testimony to the people who worked on those standards that it's as good as it is. Which isn't to say it's not complex. My systems engineers will tell you the UMTS standard is ten times more complicated than the 2G CDMA standard. But a lot of that's about lessons learned from second-generation experience. One of the reasons vendors had so much trouble with the 2G CDMA standard was that it was a totally new air interface. Those lessons have been learned and a lot have been applied to UMTS.

3GS: ***With infrastructure on both sides complete or close to completion, how would you characterise the major technical differences between CDMA2000 and UMTS?***

BD: Well, spread spectrum technology dominates both standards. CDMA2000 uses less bandwidth, because, in part, it had to be backward compatible with its IS-95 CDMA predecessor. UMTS uses a broader bandwidth. If you have the spectrum, UMTS will provide more capacity. Then the CDMA standards bodies made certain decisions about how to evolve the standard.

A good example is CDMA2000 1xEV-DO. EV-DO has been developed for high-speed data-only capabilities. In other words, network performance is optimised for data and we're seeing some unbelievable speeds and throughputs with EV-DO – but it's data only, doesn't carry voice. EV-DO has already been successfully trialed and will be emerging shortly in the marketplace. At present, there's nothing comparable in the immediate UMTS rollout. Is that a major difference or not? Will EV-DO be an important element in the markets that use CDMA2000? Time will tell – from my perspective it's a marketing decision more than a technical consideration.

So from the technology perspective, there really aren't any radical differences – there can't be, because at heart they're both spread spectrum products. You can look at the architectures and see how both evolved from their respective 2G heritages. But to me, those are second order effects. Both standards have adopted the most efficient technology we know for air interfaces, to provide the highest capacities for both voice and data. We've taken many of the algorithms developed for, say, power control in a CDMA2000 context and applied them to good effect in our UMTS development. In short, there's very little difference between the technologies at a fundamental level. I think the similarities are much greater than the differences.

3SG: ***Has Lucent's CDMA experience given it any material advantage in the UMTS market? And how is that advantage going to play out over the next 18 months?***

BD There are over 200 parameters that are key to performance in spread spectrum technology. Knowing how to vary those parameters is key to getting good performance out of spread spectrum networks. This is where Lucent has an advantage over all other infrastructure vendors. We've built many more spread spectrum networks than any other vendor, and all the lessons we've learned from CDMA we're applying to UMTS.

3GS: ***But what does this add up to in a deployment context?***

BD: It adds up to high performance, cost-effective networks. If you'll allow me to brag a little, when operators publish information about the performance of their networks, Lucent's CDMA networks come out on top just about every time. We're able to deliver better performance on the key system metrics because of our extensive spread spectrum experience along with increased capacity and throughput.

This is because we build our own ASICs (application specific

> "We've built many more spread spectrum networks than any other vendor, and all the lessons we've learned from CDMA we're applying to UMTS."

integrated circuits). This enables us to incorporate customised functions and features that improve performance, which is why our networks always come out on top. Then there are scale economies. Who can provide base stations that have the best performance for value? In our case, the base station we use for UMTS is identical to the one we use for CDMA2000, with the exception of one chip – the ASIC. Our UMTS customers benefit from the volume shipments we make in CDMA2000. So, we have the best performing networks in CDMA2000 and we're going to pass on that knowledge to create the best performing UMTS networks.

> **"In the next 12 months the industry needs to get real about UMTS. We've got to figure out our targets and then focus on bringing the premium services to market."**

3GS: ***Lucent is the leading CDMA player in the US and Asia, but you've still to make your mark in Europe. Do you feel that's likely to change?***

BD: It's already beginning to turn around. As the practicalities of rolling out spread spectrum networks become a reality, many operators are coming to realise they need the real-world design and deployment skills Lucent has at its disposal in terms of that technology. The fact is, we're in the opening mile of the UMTS marathon. We believe this race still has a long way to go.

We were not first to market with CDMA. In fact we were behind the apparent leader by, many estimate, at least a year. But the reason we were behind was because we had more respect for the technical challenges than our competitors. So we were more realistic about our development timelines – which has also been the case with UMTS.

Today Lucent leads the CDMA market and has the largest market share of any vendor. So we know this is a marathon not a sprint. We know that when we get the chance to demonstrate our capabilities we are head and shoulders above the competition. This is why the European pilots we are running with companies like Telefonica Moviles and T-Mobile are so important. We believe they will demonstrate we have the technology to bring high-speed data to enterprises and our customers first to revenue and market share with UMTS. Which is when we'll start to build significant market share in Europe.

3GS: ***Do you think first to market with UMTS matters from an operator's perspective?***

BD: Oh, absolutely – especially if you're talking about high-speed data for enterprises. Our market studies have shown that the first two operators to get into that market tend to maintain and retain the largest market share. A third operator in can get some business, and beyond that, it's over. So being first to market for high-speed data to enterprises is a key consideration from an operator perspective.

And remember, these enterprises are your premium customers. These are the customers who are the 20 per cent of your base who give you 80 per cent of your revenue. They are sticky customers. They tend not to churn a whole lot. After all, when you've got 2000 employees on a particular network, it's hard to change them on to somebody else's network and you prefer not to. So enterprises tend to be sticky, valuable customers and you want to get to them before your competitors.

3GS: ***Finally, how do you see the market developing between now and World Congress 2004?***

BD: Given the economic pressures facing European operators, the big question for everyone is: 'How am I going to differentiate myself going forward?' If I were an operator, that's what I'd be worried about. The answer is to a large extent dependent on when UMTS rollout starts to gain real traction. As I've said, over the next 12 months operators must interrogate the UMTS business case via the kind of pilots we discussed earlier.

The advantages of this approach are obvious. This is a relatively low cost investment that takes us out of the realms of wishful thinking, away from the drawing board and into the real world. In other words, in the next 12 months the industry needs to get real about UMTS. We've got to figure out our targets and then focus on bringing the premium services to market. And we've got to get it right first time – right now it's a very tough marketplace for both vendors and operators. ■

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