Regulatory challenges raised by an increasingly wireless world

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In 1891, in an effort to emphasis the significance of Heinrich Hertz's discovery of electromagnetic waves, the English physicist Sir Oliver Heaviside remarked: "Three years ago, electromagnetic waves were nowhere. Shortly afterward, they were everywhere!" (Naughton, 2003). Today, the same can be said for the wireless systems that exploit those Hertzian waves.

An estimated 80 per cent of the world's population is now covered by wireless access (Gilhooly, 2005). Wireless penetration has exceeded 100 per cent in at least ten countries (TeleGeography, 2005) while mobile services now account for 90 per cent of all new voice connections (Gartner, 2005). Understandably, there is considerable excitement about the possibilities created by this increasingly wireless world. However, this trend towards wireless also raises many challenges for national regulatory authorities (NRAs) and policy makers that will need to be overcome if the full potential of this technological revolution is to be realised. This article identifies some of these key challenges.

Elimination of structural inequities

The new cost structures and business plans that are made possible with wireless deployments will both encourage new entrants into existing markets and create new ones, presenting an opportunity to expand the footprint of infrastructure-based competition. In order to justify investment in new wireless infrastructure and applications, wireless operators will require *ex ante* regulatory certainty on such issues as the tenure of spectrum licences, the management of interference, and their abilities to install infrastructure on public and private lands.

However, the legislative and regulatory frameworks administered by many NRAs often differentiate wireless network operations from wireline. Different types of licenses may be issued, different universal service funding arrangements may apply, and different network access obligations will be imposed. In such circumstances, it can be difficult to ensure that regulatory arrangements are applied consistently across the industry and that innovative uses of wireless technology are not unduly constrained by legacy regulation.

Even regimes that are ostensibly technology neutral may find that some aspects are unintentionally biased against wireless. In Australia for instance, as Wi-Fi hotspots were gaining popularity, it was discovered that a carrier licence would be required in circumstances where a licence was unnecessary if cables were used instead wireless infrastructure. As inequitable or unpredictable regulatory treatment can deter new investment and retard development, it is important that NRAs are diligent in identifying and addressing any such occurrences.

Spectrum management

The growth of wireless access systems will significantly increase demand for radiofrequency spectrum. To meet this demand, it may become necessary to re-farm certain bands and relocate particular services to other parts of the spectrum. However, the need to respond quickly to such changes in demand, together with the pace of innovation, will increasingly place pressure on the traditional command and control approach to spectrum management adopted by many NRAs.

This in turn may foster support among industry for broader deregulatory reform of spectrum management practices and increases in the proportion of license-exempt spectrum. Ironically, as commercial operators make greater use of the deregulated and unlicensed spectrum, they will also demand greater vigilance from NRAs in the enforcement of radiated power restrictions to forestall a tragedy of the commons (Harlin, 1968). As industry's appetite for regulatory reform may be greater than that of the policy makers, NRAs will need to be especially proactive in accommodating the extra demand for spectrum to ensure that opportunities are not missed due to a myopic aversion to reform (Pitlik, 2004).

The users and misusers

As wireless services and applications become more prevalent, the consumer education and protection responsibilities of NRAs will increase in both difficulty and importance. NRAs will need to help raise consumers' awareness of such issues as wireless security, encryption, and power supply; manage quality of service expectations; and address possible concerns about electromagnetic radiation. However, a particular type of "consumer" will create considerably greater challenges.

The inability to pinpoint the location of wireless users and the potential for user anonymity will undermine the traditional intelligence gathering techniques of many law enforcement and national security agencies. Ubiquitous and open access, user-controlled encryption, and converging technologies that permit seamless handover will also make lawful interception significantly more complex. Such factors are likely to lead to tension between service innovations on the one hand and the needs of law enforcement agencies on the other; a conflict that NRAs and policy makers will have to balance prudently and resolve.

Universal access

For many NRAs and policy makers though, the greatest challenge will be to realise the full potential of wireless technology to bridge the digital divide in their respective countries. The affordability, ease of deployment, and reach of wireless systems offers many countries their first real opportunity to deliver universal access to information and communications technologies. See, for example, the use of wireless broadband technology to supply voice telephony to remote villages in Bhutan or the Sustainable Access in Rural India (SARI) project (Best, 2003). To this end, it is essential that NRAs and policy makers create supportive regulatory frameworks and attractive investment environments. This has been recognised at the highest levels of the United Nations, with Secretary-General Kofi Annan imploring national governments to 'review their policies and arrangements to make sure they are not denying their people the opportunities offered by the digital revolution' (Annan, 2002). Nevertheless, this opportunity will risk being missed through institutional inertia if NRAs and policy makers fail to appreciate the potential human consequences of inaction. Accordingly, this is one of the most important and exigent challenges ahead for many developing countries.

Conclusion

The regulatory challenges raised by our increasingly wireless world are considerable, but they are not insurmountable. With foresight and planning, NRAs and policy makers will be able to foster and exploit wireless developments so that their benefits—like the Hertzian waves of 1888—can be enjoyed everywhere.

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