About the UMTS Forum

Founded in 1996, the UMTS Forum is an international industry association that is committed to the success of Third Generation (3G) UMTS mobile systems. Bringing together players from across the mobile industry on a peer-to-peer basis, the UMTS Forum promotes a common vision of 3G/UMTS and its evolution, as well as its worldwide commercial success. Membership of the UMTS Forum is open to everybody with a commercial interest in 3G/UMTS mobile – including fixed and mobile network operators, infrastructure vendors, terminal device manufacturers, regulators, media/content providers and developers of 3G/UMTS services and applications.

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UHF SPECTRUM FOR IMT: bridging the digital divide

Actions required under ITU WRC-07 Agenda Item 1.4

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Nancy: a mother living in a small village in Kenya

Nancy has recently been able to save enough money to buy her own mobile phone; making an immediate difference to the quality of her family's life.

Nancy can use the mobile phone to communicate directly with the nearest health centre. When her children are sick, she can call the health centre in advance to check if the doctor is there, and to make an appointment. For Nancy, this is a big improvement. Before she owned the mobile phone, the family had to travel 8km to the public health centre, and hope that the doctor was there, or – if they could afford it – pay to see the doctor at a much more expensive private clinic in a town even further away.

Photo: Kevin O'Hara, Doug MacLellan/IBL

1. Introduction

It's well recognised that there are still significant differences between developed and developing countries, with regard to infrastructure in general – and more specifically to the availability and affordability of new communication technologies. This difference is articulated as the so called 'Digital Divide'.

The Digital Divide is a symptom of wider range of general problems facing parts of the developing world, but equally digital communications can offer at least part of the solution for these societies. Closing the technology gap can play a role in bridging the wider divide between the developing and the developed regions. In the words of the former Secretary General of the United Nations, Kofi Annan: *"There is a tremendous yearning, not for technology per se, but for what technology can make possible."*

Global mobile penetration approaches 50%

- At mid-2007, global mobile penetration stood at approximately 46% – and this usage of public mobile communications can contribute tremendously to reduction of the Digital Divide. This high penetration figure would not have been achievable without the current harmonization of spectrum for 2G and 3G systems such as GSM and UMTS.
- Addressing the needs of the remaining half of the world's population, however, will require low cost mobile devices and cost effective wide-area coverage solutions. Low cost devices are on the way, but to provide cost effective coverage solutions there is a need to secure enough resources in the lower spectrum range.
- The right decisions taken at WRC-07 would give IMT the opportunity to further this success and reduce the digital divide.

The experience from developing regions shows that mobile communications already provides connectivity and services to improve the life of billions of people. The numbers speak for themselves. There are already three billion mobile users, connected to networks covering more than 80% of the global population.

It's the availability of terrestrial mobile services that stands to have the leading impact on social and economic development. Indeed, services that can leverage the benefits of mobile phones – such as micro credit – are already being acknowledged as important factors in attaining greater social freedom and release from poverty. Indeed, Prof. Muhammad Yunus and the Grameen Bank were awarded the Nobel Peace Prize in 2006 for their work to stimulate economic and social development 'from below' using tools such as micro credit.

Mobile services are offered by a range of providers as sustainable businesses without the need for state aid. As such they are helping to boost local economies, deliver important social services like healthcare and education, improve democracy and generally raise standards of living.

2. Mobile communications for all

There are still many barriers to the continued roll-out of mobile communications in an efficient and sustainable way. They include:

- cost of access for consumers
- cost of ownership for service providers
- complex issues of government subsidies to other services
- regulation
- taxation

The development of affordable handsets, more efficient network equipment, new business models, and more open-minded government approaches are gradually improving the prospects of providing mobile communication access for all. Therefore, the future looks exciting. While many developed regions are still relying on the 100-year old fixed-line telecommunications network to deliver broadband Internet services, emerging markets are set to leapfrog these 'legacy' networks with a raft of new IMT based technologies.

The current IMT-2000 family of standards provides a clear, cost-efficient roadmap from basic voice and data services to true mobile broadband services based on WCDMA, HSPA and LTE technologies, and also towards the future IMT-Advanced family.

The “mobile lady”

Rural villagers in Bangladesh can afford a mobile phone collectively through the “mobile lady” who purchases a mobile phone kit. She then becomes a phone service provider, charging the villagers for calls. Mobile ladies in Bangladesh started as a simple business idea of a village phone. Today it’s a burgeoning business, bringing connectivity to thousands. Over time, this has evolved to include data services as well.

This can serve as an example of how access to public mobile communications has a ripple effect at the micro-economic level. A mobile phone can help start a series of businesses; and, not just a result of people doing business over the phone. There are further business opportunities including phone charging and mobile phone repair shops.

Photo: Pavel Rahman/Scanpix

3. Spectrum for IMT

Together with the current family of IMT-2000 standards – including UMTS - the expected new ITU framework for IMT-Advanced will form the International Mobile Telecommunications (IMT). IMT will be designed from a technical, operational and regulatory point of view to provide an extensive choice of mobile communication services, including broadband wireless access. These services will take into account the requirements specific to the developing regions of the world.

UMTS Forum recommendation

- In order to reduce the Digital Divide, harmonization of about 100 MHz below 1 GHz for IMT at WRC-07 will result in economic coverage as well as costefficient user equipment.

WRC-07 is the right time to help ensure the future of mobile communications. The requirement for new allocations and identifications of spectrum is expected to not only attract a high level of interest, but also to pose some significant challenges. Considering current traffic developments, WRC-07 needs to continue the success of previous Conferences which incorporated two elements into the decision making:

- globally harmonised spectrum
- global standards

These elements are critical to enabling economies of scale, affordable consumer devices and market success.

Of these two factors, globally harmonised spectrum for IMT is the most critical issue at WRC-07. In fact, identifying additional spectrum for IMT[1] with highly developed capabilities is essential to meet the projected demand for IMT mobile broadband high bit rate services.

Furthermore, the identification of globally harmonised spectrum supports globally standardised radio technologies, which underpin the ability to achieve economies of scale that enable affordable user equipment. It allows for the service providers to reduce network OPEX and CAPEX and to bring more affordable and ubiquitous advanced mobile broadband services to a wider range of consumers to satisfy the communications requirements in all regions of the world.

If WRC-07 identifies new spectrum for IMT according to the considerations above, it will pave the way for a truly global mobile digital society for everybody ensuring that next generation mobile networks and services are universally available.

Why is more spectrum needed for IMT?

- IMT will offer universal communications for all, and it needs to be very versatile in performance providing full mobility/wide area coverage/large traffic volumes/ high-bit-rates. The existing IMT-2000 spectrum, however, is not sufficient because:
  - it is already heavily used by 2G networks in many parts of the world
  - it does not support the expected high bit rate technologies with wider (than 5 MHz) channel bandwidths
  - it cannot cater for expected capacity demand

In light of the above objectives and various proposals to the Conference, the UMTS Forum recommends that WRC-07 takes the following decisions on Agenda Item 1.4:

- To allocate the frequency band 470-862 MHz to the Mobile Service on a co-primary basis in Regions 1 and 2, and identify a harmonised sub-band of about 100 MHz for IMT from the band 470-862 MHz in all Regions to satisfy the coverage needs.
  - a globally harmonised solution for providing IMT services in large geographical areas of low population density
  - a globally harmonised sub-band is needed in order to achieve cost-efficient equipment available in a timely manner.

- To identify the band 2300-2400 MHz for IMT; this band is located close to the bands already identified for IMT-2000 mobile services:
  - this would ensure that these bands share similar propagation conditions
  - may facilitate reuse of technical components in equipment and devices used for the bands 2 GHz and 2.5 GHz.

- To allocate the band 3400-4200 MHz to the Mobile Service on a primary basis and identify the whole band for IMT:
  - fulfilling the anticipated capacity needs of the future IMT systems including mobile broadband wireless access applications
  - *to cater for expected future high bit rate services with very wide (up to 100 MHz) channel bandwidths – provided by IMT Advanced technologies*

New spectrum for IMT should be decided at WRC-07

- A delayed spectrum decision, beyond the WRC-07, would hold up the possibility to reduce the Digital Divide in due time. This may lead to the fragmentation of the spectrum for the future IMT networks.

4. Conclusions

WRC-07 is encouraged to decide on a regulatory frame-work that supports bridging the Digital Divide. This framework would allow service providers to introduce advanced mobile technologies in a cost-efficient manner that enhance the availability of the services and thus the mobile users' experience. IMT-Advanced technologies are especially important to the continued growth of wireless services, particularly in emerging markets. Here, IMT solutions will improve geographical coverage, support new business models and make affordable IMT devices more readily available.

Range creates affordability

- The Digital Divide can be reduced by identifying bands with better radio wave propagation properties, such as the UHF band (470-862 MHz) for range and affordability.

The UMTS Forum encourages WRC-07 to identify globally harmonised spectrum for IMT below 5 GHz. Hence, the UMTS Forum recommends, where applicable, that WRC-07 allocates spectrum to the Mobile Service on a primary basis; specifically, the UMTS Forum encourages WRC-07 to identify for IMT the candidate bands as discussed above, primarily a harmonised sub-band of around 100 MHz from the band 470-862 MHz, the 2300-2400 MHz band, and the 3400-4200 MHz band. By doing so, WRC-07 can ensure that IMT technologies can be deployed successfully, bringing rich mobile communications and reliable broadband access to everyone, everywhere – and to bridge the Digital Divide.

A chicken and egg situation: if you don't have any money, how can you afford the mobile phone that will help you to earn money?

Mobile communications backed by a proper and sustainable business plan can help less wealthy individuals and communities to improve their economic and social situation.

The key is to provide access by making mobile communications available to small communities. This can spur small-scale commercial possibilities – like phone sharing businesses – which generate local income and provide access to mobile communications at minimal cost. Phone sharing is one such idea that has caught on rapidly in emerging markets such as South Africa. What's more, the creation of wealth in any given area tends to have a knock-on effect: as people earn more, they buy more, and use more services. And this in turn means that more people generate more wealth.

Photo: R. Matina/IBL