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[Home](#) > [New horizons in mobile wireless communications](#) > New horizons in mobile wireless communications

New horizons in mobile wireless communications

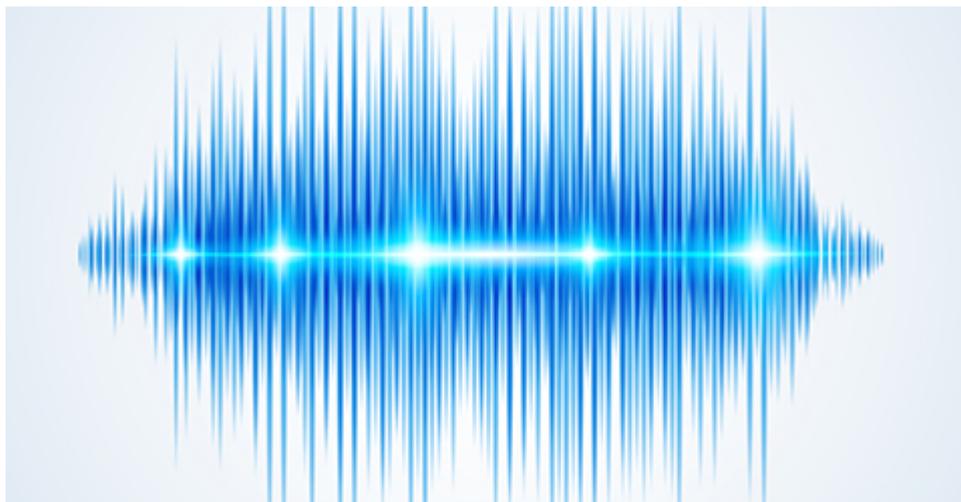
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Under-utilised radio frequencies or spectra are behind the QoS MOS team's plan to provide a high-quality intelligent mobile wireless platform at a competitive price.

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There are typically two ways to provide mobile wireless services. The first is by signing up with a licensed mobile network operator; the second is using unlicensed wireless spectra. Customer satisfaction depends to a large degree on the quality of service (QoS) and number of base station sites, as well as the number of WiFi access points available. Unfortunately, many customers are at times dissatisfied on both counts.

Driven largely by industry eager to provide a long-term solution to ever-increasing data demand, the QoS MOS project looked into establishing a blueprint that would offer efficient radio access to future networks. Over three years, the project developed a 'cognitive radio' (CR) concept enabling mobile wireless systems to improve performance over licensed and unlicensed bands by exploiting a third way: spectrum sharing.

Cognitive radio is a form of spectrum management system in which a wireless system can intelligently detect which communication channels are in use and which are not. It then instantly moves traffic to vacant channels while avoiding those in use. This optimises use of available radio-frequency spectra while reducing interference for other users.

Important for the project's success has been the trend in Europe to open up existing spectra for sharing. Users will have access to this spectrum but will need to establish trusted methods that avoid

interference problems. The QoS MOS blueprint meets this need and is also flexible enough to adapt to different regional and national regulations.

Making use of technology and service-neutral spectra opportunistically could ultimately provide an alternative to indoor and outdoor mobile wireless communications.

“When 3G was introduced a few years ago, it was really expensive as operators had to completely retool and purchase entirely new spectra. As our blueprint involves the sharing of existing spectra, it would be much cheaper,” says QoS MOS project coordinator Michael Fitch of BT in the United Kingdom.

The QoS MOS approach, for example, allows companies to use “white spaces” in the UHF bands currently used by television broadcasters, or so-called TVWS. These spaces have become under-used with the rise in popularity of digital terrestrial television.

The system’s flexibility means new service providers could enter the market, allow networks to grow as required and enable custom application development. “Coverage – better than DSL in some cases – connectivity for broadband and new applications like machine-to-machine could be provided by a large number of small and flexible base-stations,” maintains Fitch.

Wide spectrum of beneficiaries

Beneficiaries include customers who will have better service, even in remote areas; network operators who will have access to a wide range of radio spectra; entrepreneurial service providers and application developers who will have a flexible and efficient delivery platform; and finally, vendors who will have unprecedented access to new markets.



QoS MOS involved 14 partners from across Europe and one from Japan, forming a critical mass. According to Fitch, BT and the UK’s communications regulator OfCom have already built a pilot TVWS spectrum management system and a commercialised version could be available “in the near term”. Other industrial project partners have similar pilot projects in the pipeline.

In developing its vision for future network management, QoS MOS consulted with an advisory board of regulators and broadcasters who helped point the team in the right direction. This expert input will be pivotal for transforming the concept into a standardised product.

“The board has been an extremely valuable resource and its membership expanded rapidly as the project progressed. Today, European regulators believe in our approach and now have the confidence to eventually adopt the QoS MOS results,” says Fitch.

Based on the project’s groundwork, which ended in March 2013, some partners are independently continuing with trials to make the platform “even more efficient” by incorporating later technologies, says Fitch.

“There are also plans to incorporate our principles of spectrum management into cloud computing,” he adds.

Now that QoS MOS has laid the foundations that make it possible for vendors and application providers to bring CR systems to market, Fitch predicts the arrival of an alternative wireless delivery platform able to deliver high quality connectivity for a range of applications at a competitive price for both the supplier and customer.

More info

- www.ict-qosmos.eu [1]

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