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Can Technology help us Better Manage Radio Spectrum?

Richard Womersley, 3 May 2018



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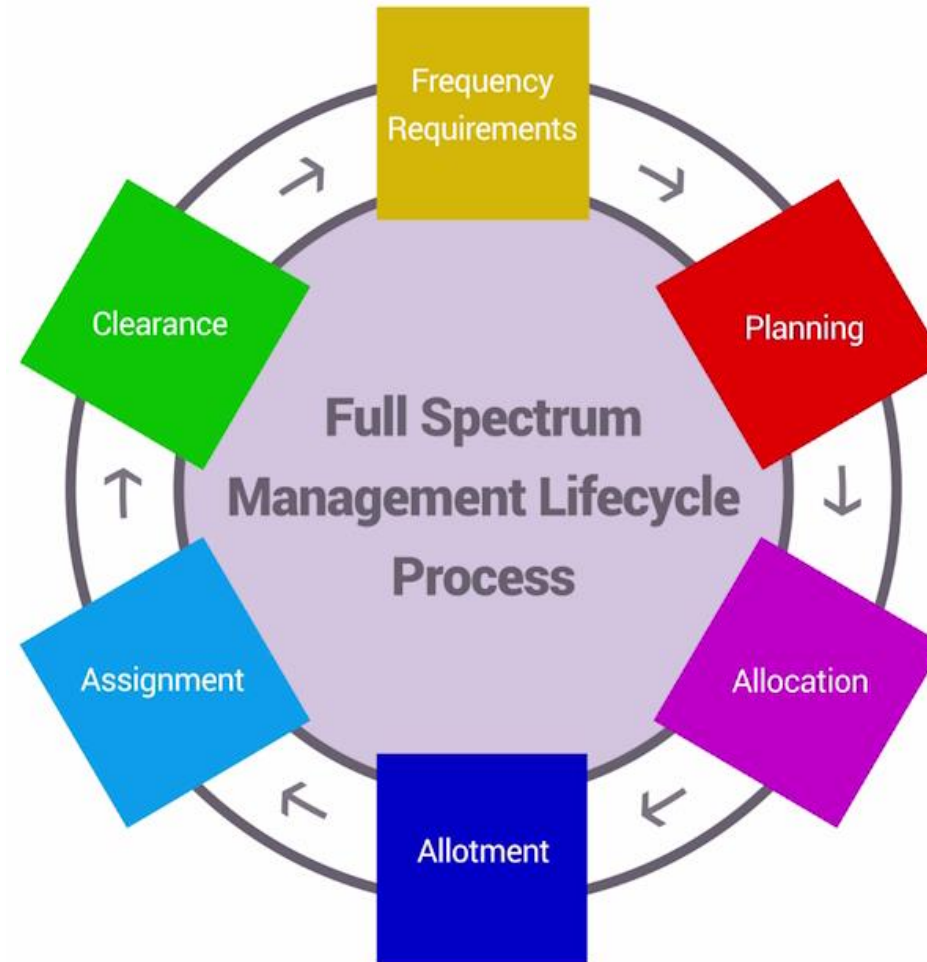
Not an LS telcom sales pitch...

- LS telcom supplies over 100 regulators across the world with state-of-the-art solutions for managing the radio spectrum
 - Software for planning, managing and licensing spectrum
 - Hardware for monitoring spectrum usage
 - Consulting, engineering and training services
- Wish to share a few examples of how technology is being used to enhance the capabilities of regulators to better manage the radio spectrum



Software can manage spectrum

- There are a number of regulators around the world whose whole spectrum management processes are handled in software, e.g.
 - UK (Ofcom)
 - Canada (Industrie Canada)
 - Australia (ACMA)
 - Oman (TRA)
- This is 'run of the mill'



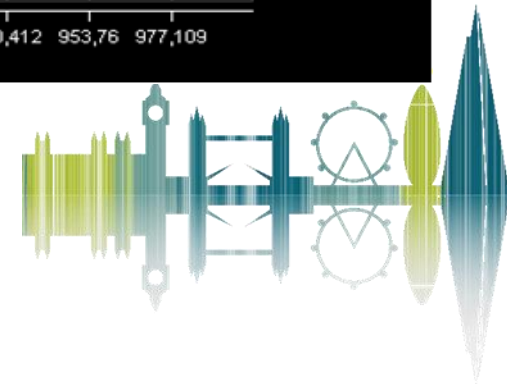
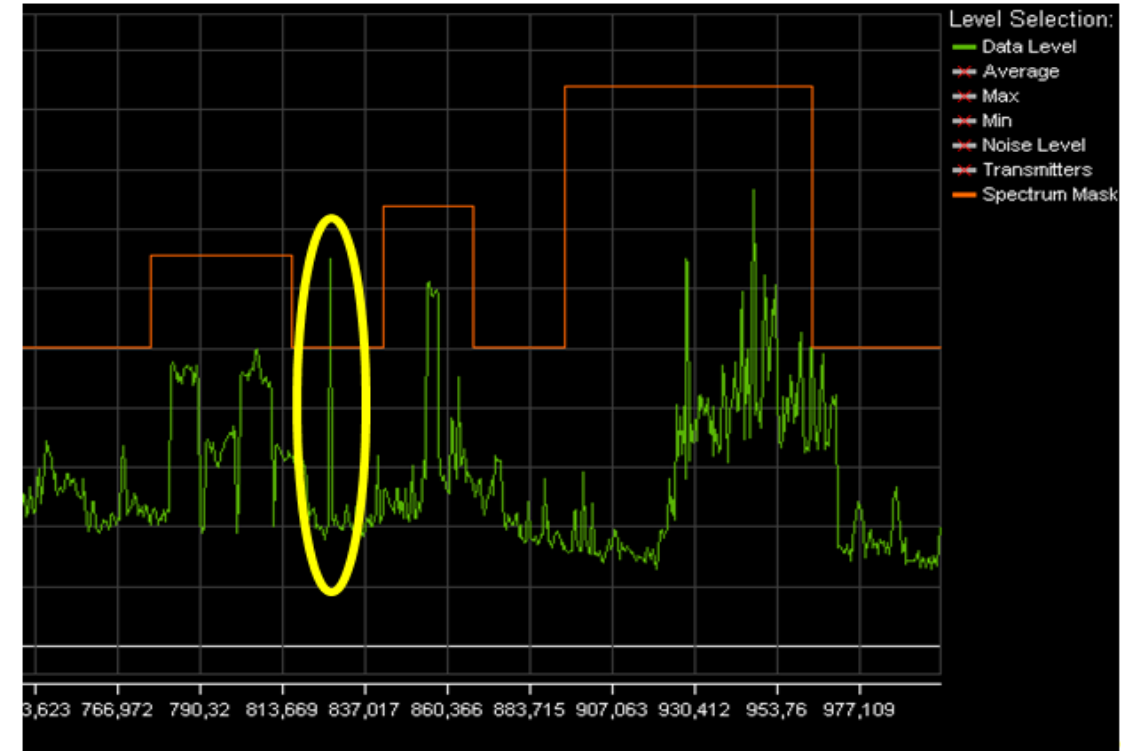
Spectrum management as a service

- Schiphol airport (Amsterdam) has outsourced the local management of the radio spectrum
 - Handling applications for wireless systems
 - Ensuring the cleanliness of spectrum
 - Assuring correct spectrum use (including through monitoring)
 - Identifying and rectifying non-compliant usage



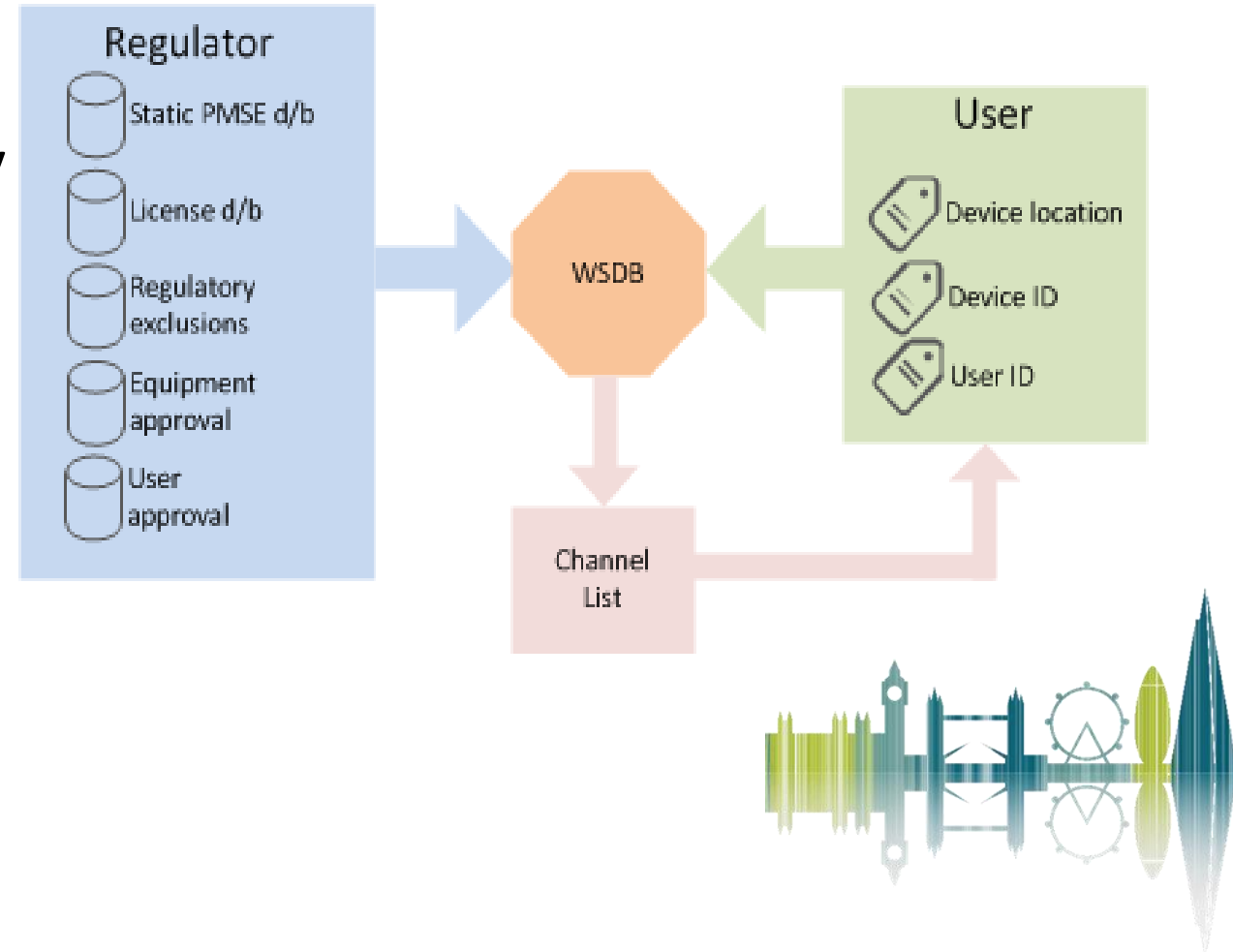
Automatic Violation Detection

- Automatic identification of unauthorised spectrum use
 - Integration of spectrum licensing database and monitoring information
 - Smart algorithms that can deal with complex spectrum environments
 - Rules based alerts and alarms
- Linked to geolocation such that identified violations can be physically located



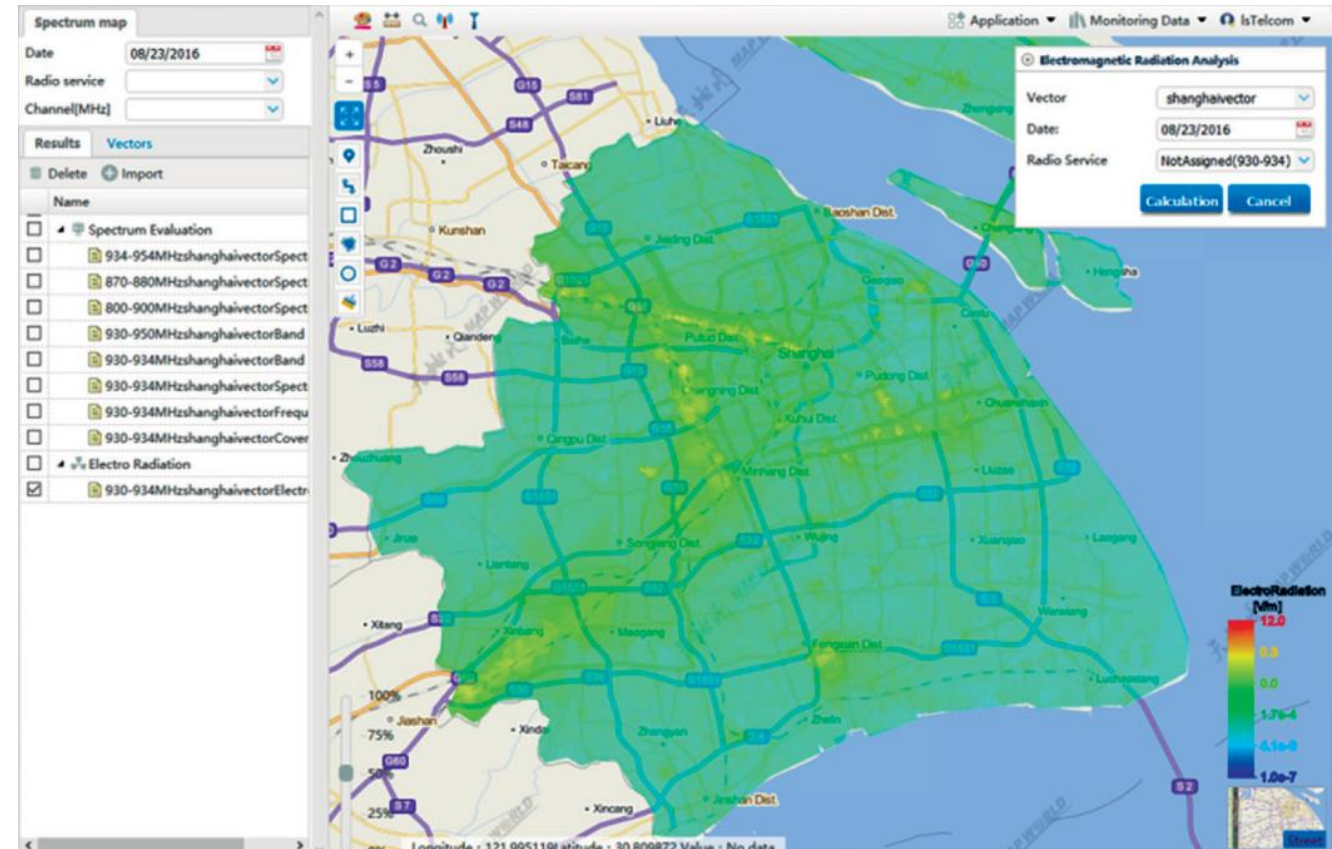
Dynamic Spectrum Access

- Moving the onus of spectrum administration from the regulator (or spectrum owner) to a third party managed service
- Can be combined (e.g. with monitoring) to handle both licence issue and spectrum assurance



Big Data & Spectrum Map

- Combination of all available spectrum usage information
 - Fixed monitoring (including DF)
 - Mobile measurements (bin lorries!)
 - Spectrum licensing database
- Intelligent data mining to yield 'heat maps' of spectrum usage
- Quickly identify
 - Unauthorised use
 - Service coverage (e.g. mobile, per operator) and not-spots
 - At a city or even street-by-street level



The future use of technology

- The fusion of monitoring sensors, databases, big data, AI and more is leading to exciting new opportunities to manage the radio spectrum
- Increasing options for the automisation of spectrum management from 'cradle to grave'
- Spectrum management can be outsourced in its entirety with no loss of security or quality assurance
- **Can technology better manage the radio spectrum?**
 - It can definitely make spectrum management better!





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