Diversity of Business Models and Interoperability

Robert MacDougall – Vodafone Group Public Policy

BEREC workshop on Enabling the Internet of Things

Brussels – 1 February 2017

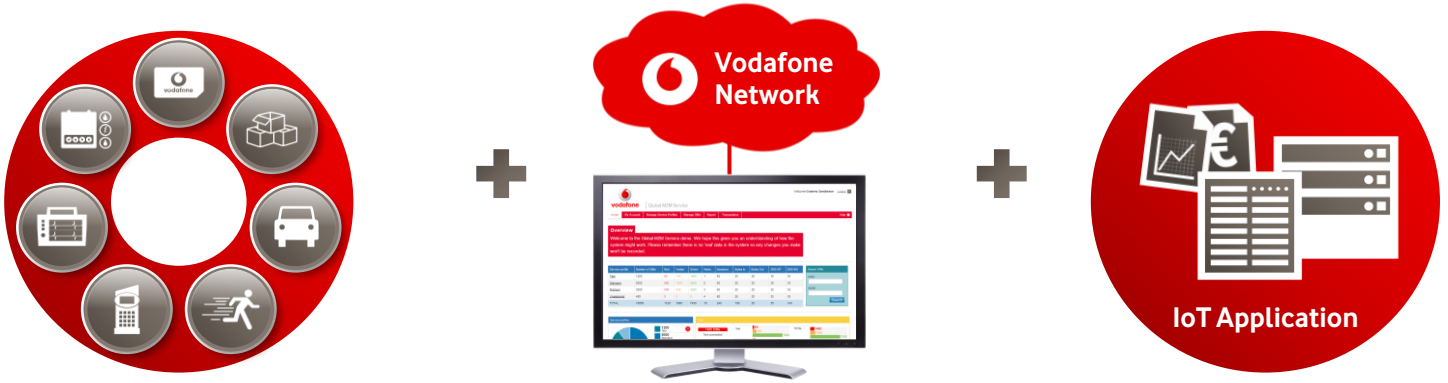
European Regulatory/Policy context

- **The Commission's Platform Communication (May 2016)**
  - "Closed platform ecosystems can further lead to efficiencies, including greater competition between platforms but they can also have adverse effects"
  - "Open platform ecosystems can offer key advantages in terms of savings on switching costs and market efficiencies".
- **Proposed European Electronic Communications Code (September 2016)**
  - Article 87: "Member States shall promote over-the-air provisioning of numbering resources – where technically feasible – to facilitate change of providers of electronic communications networks or services by end-users other than consumers, in particular providers and users of machine-to-machine services"
- **Intelligent Transportation Systems (Nov 2016)**
  - **European Commission ITS Masterplan** – "Currently, the most promising hybrid communication mix is a combination of ETSI ITS-G5 and existing cellular networks" – possible Delegated Act by 2018
  - **RSPG draft ITS Opinion** - "mobile networks will provide opportunities for services to complement ITS, in particular using enhanced 4G technology and also 5G features".
- **Commission consultation on Building the European data economy (Jan 2017)**
  - The Commission states that the public consultation will help shape the future policy agenda on the European data economy including whether and to what extent digital non-personal machine-generated data are traded and exchanged, the nature and magnitude of any barriers to accessing such data and ways of tackling those barriers.

Our vision

“To connect every machine to transform lives and businesses”

Vodafone's approach to the Internet of Things



Vodafone combines technical hardware expertise, managed connectivity and software applications to offer an end-to-end, single point of contact solution for IoT capacity

Hardware/device

- Device and connectivity – bundled offering
- Partnerships with device vendors

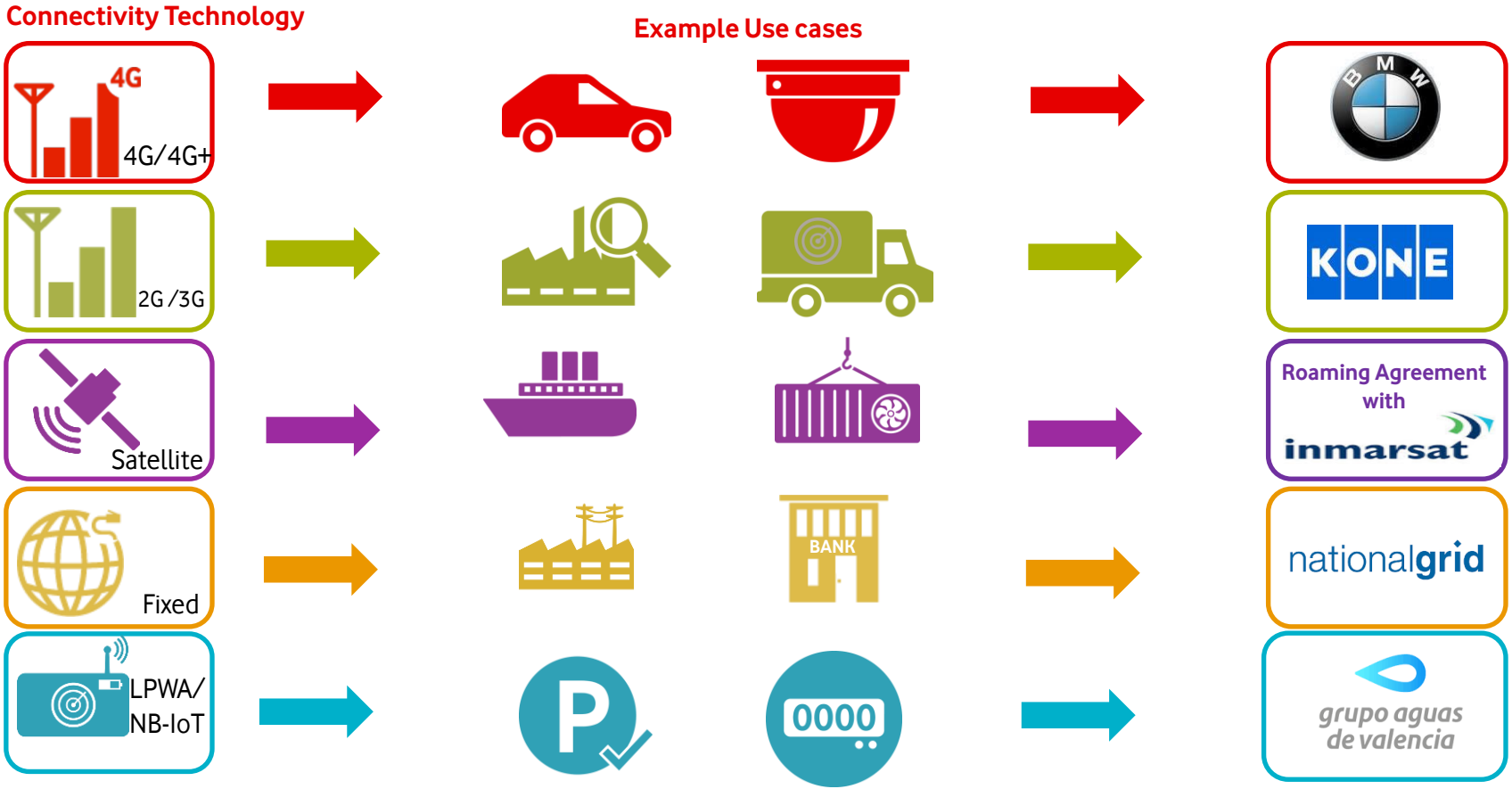
Managed IoT Connectivity service

- Network
- Global SIM
- Logistics
- Global M2M platform
- SLAs
- Customer support

IoT Applications

- Asset tracking
- Smart metering
- Telematics
- Fleet management
- Remote monitoring
- Wearables

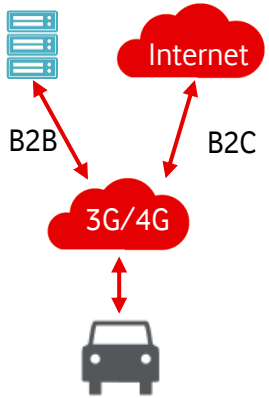
A range of technologies depending on the customer requirement



Spectrum case study - connected and autonomous cars

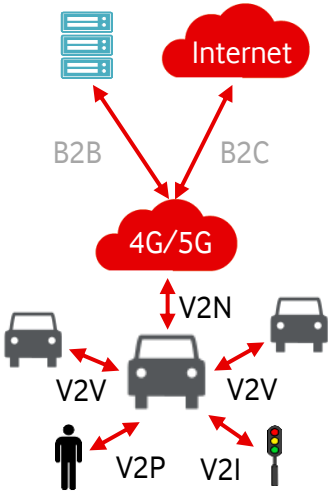
Now

+ Broadband access (In-car Wi-Fi hotspot)



Evolution

+ V2X communication



Key spectrum interoperability considerations

- Relates to use of different technologies(IEEE 802.11p and C-V2X) for applications in the 5.9GHz band, which has been harmonised for the deployment of safety-related Intelligent Transportation Systems in the EU.
- 3GPP's work in this area is important because it already includes (in the form of Release 14) measures for C-V2X to coexist with IEEE 802.11p in this band, and further 3GPP activity is envisaged in this area.
- Further regulatory activity could be required to enshrine the partitioning of 5.9GHz between C-V2X and IEEE 802.11p and to consider alternative authorisation requirements for different V2X services.

OTA update - despite early adoption in automotive, widespread market adoption of eUICC has been slower than expected

Figure 3-1: Global cellular-based IoT gross additions [Source: Machina Research, 2015]

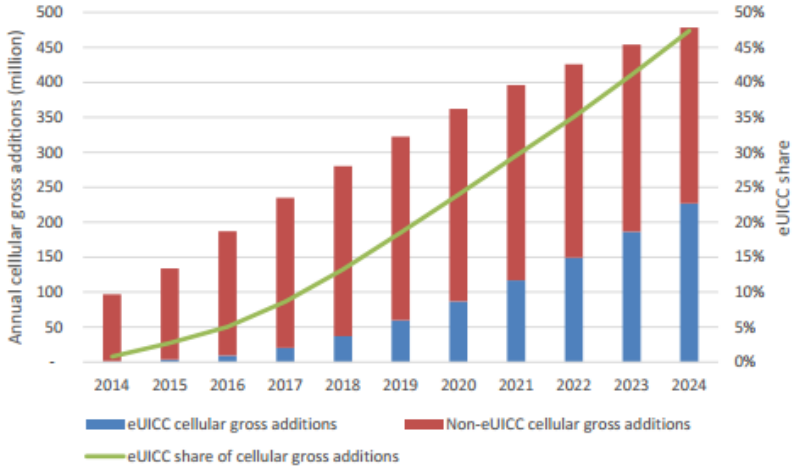
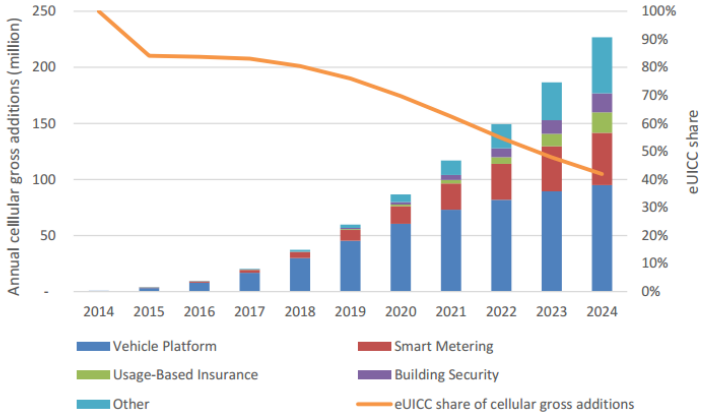


Figure 3-2: Global cellular-based IoT gross additions by major application [Source: Machina Research, 2015]



"Embedded connected car connections decline over the period, from more-or-less 100% of eUICC SIMs in 2014 to 42% in 2024"

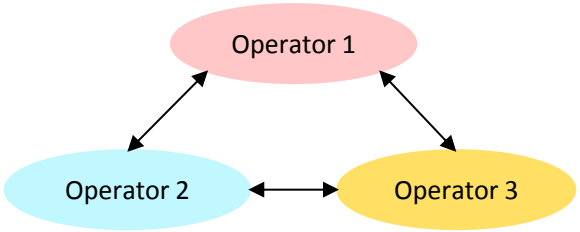
Cost of deploying eUICC and historic lack of interoperability (e.g. across SIM vendors) are hampering adoption.

Envisaged next steps to address these challenges

Business process templates

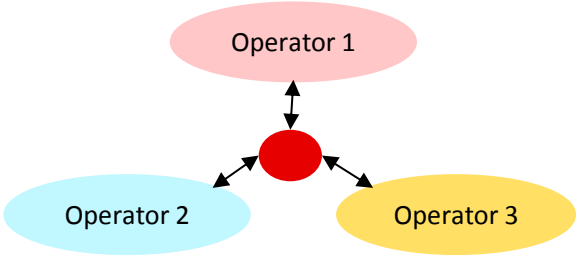
Vodafone is a lead operator for a GSMA eUICC Proof of Concept to develop transparent, traceable, predictable and scalable business process to migrate customers at end of contract.

Peer to peer solution



Discussion has started within GSMA to develop a messaging system between operators to manage the switching process based on an eUICC Proof of Concept

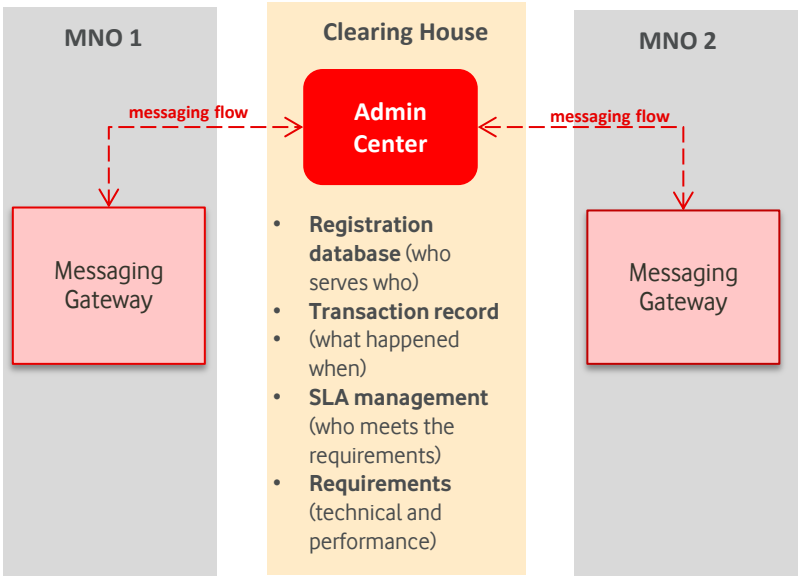
Centralisation solution



Sharing Vodafone's vision for an Independent Entity

Underpinned by **GSMA activity**, such as GSMA's remote Provisioning Architecture for Embedded UICC Technical Specification , V 3.1 (May 2016), SIM vendor interoperable, available at http://www.gsma.com/connectedliving/wp-content/uploads/2016/07/SGP.02_v3.1.pdf

Vodafone's view on the potential role of an Independent Entity



- Have off the shelf solutions supporting key services required for an Independent Entity
- This Independent Entity may already be integrated with mobile network operators for the provision of services related to number portability
- This would therefore build on existing technical services offered to operators, such as those that support number portability.

Vodafone's policy recommendations

- Regulatory policy should facilitate the creation of an Independent Entity for OTA switching
  - The mobile industry is driving OTA for those enterprise customers that want it and endeavouring to remove the complexities through a set of standardised business processes. A supportive regulatory policy framework to promote the activities of an Independent Entity could help drive the market.
  - Don't conflate switching and numbering: many customers still ask for supranational/extraterritorial use.
- Spectrum interoperability challenges need to be addressed in the automotive sector
  - To promote the growth of connected car/V2X services across the EU, further regulatory activity in the 5.9GHz band to implement a technology neutral approach (i.e. C-V2X and IEEE 802.11p) may be required.
- Regulation should focus on ensuring access to/interoperability of 'public' machine data
  - There is much that can be done to enhance access to and interoperability of public sector machine data.
  - The ongoing work of organisations such as the GSMA (through its IoT Big Data activity which will make harmonised data sets from multiple sources available to developers and third parties through common APIs), the AIOTI and ETSI (for example its newly established Context Information Group on Smart City interoperability) have roles to play in advancing market development related to 'private' machine data.