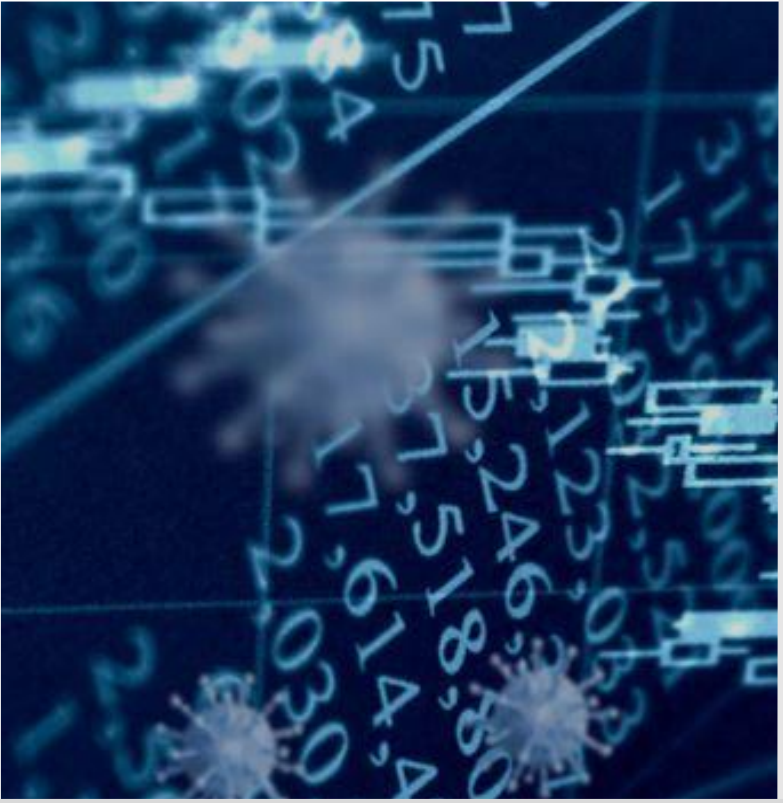
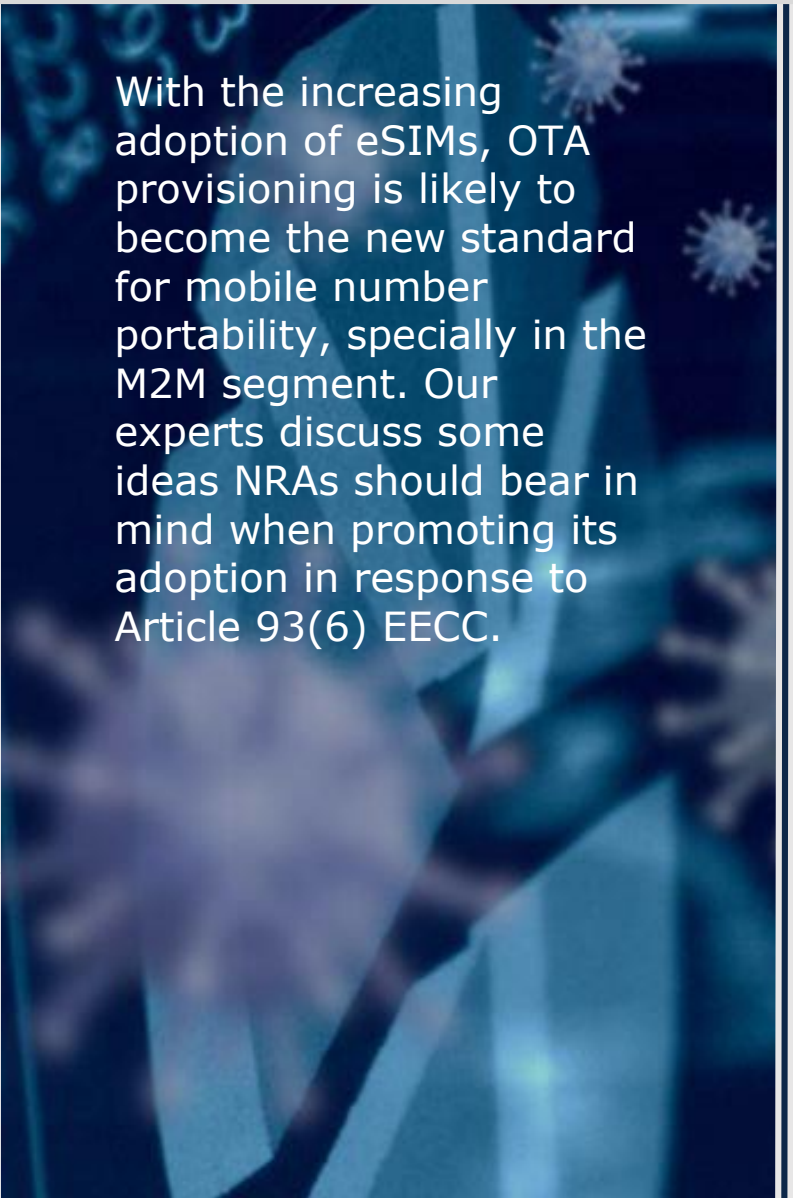


Axon

Advisory

Research

Promoting Over-The-Air (OTA) provisioning in Europe: Implementing Article 93(6) EECC



With the increasing adoption of eSIMs, OTA provisioning is likely to become the new standard for mobile number portability, specially in the M2M segment. Our experts discuss some ideas NRAs should bear in mind when promoting its adoption in response to Article 93(6) EECC.

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1. Introduction

Over-the-Air (OTA) provisioning refers to a technology that enables the remote (wireless) reprogramming of SIM cards or equivalent communications equipment identifiers. It thus obviates the need for physical access to the devices concerned.

Over-the-Air (OTA) provisioning allows remote number portability over eSIMs.

OTA provisioning is a relative newcomer in the regulatory sphere, although already well-established in the industry, and its benefits, challenges and relevance vary drastically across different segments, applications and stakeholders. This diversity may pose a challenge to a more technology and application-neutral regulatory approach as an EU-mandated guiding principle.[1]

With the official deadline for the EECC's implementation by Member States now just behind us, among other implementation challenges, NRAs are faced with the need to adopt the right policy and (if justified) regulation on OTA provisioning in order to comply with their country's obligations under the EECC. They have only limited precedents to rely on, and the implications of this are mixed: NRAs have a chance to provide a model for their peers – but may also face the risk of venturing in the wrong direction.

As a framework of reference for any NRA measures on OTA provisioning, the EECC provides only limited, high level, guidance, and a flexible range of options. Specifically, Article 93(6) EECC requires Member States to promote OTA provisioning:

Article 93(6) EECC requires Member States to promote OTA provisioning under certain conditions.

- where technically feasible;
- to facilitate switching of providers of electronic communications networks or services by end-users;
- in particular providers and end-users of machine-to-machine services.

[1] The EECC requires expressly, in its Preamble 249, Member States to "strive to ensure technology neutrality in promoting over-the-air provisioning."

2. Relevant regulatory considerations

Close reading of Article 93(6) and the other relevant provisions of the EECC (e.g., Article 106(6), Preamble 249 and Preamble 281), provides some insights on the key regulatory considerations NRAs must bear in mind when deciding on any need to regulate or otherwise deal with OTA provisioning:

- **Treatment of P2P (consumers) and M2M markets**. As is evident from Article 93(6) EECC, the main policy objective targeted by the EECC, and hence a priority in designing the right regulatory approach, is to support the M2M industries. In fact, the original EECC proposal referred to facilitating "*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*" (emphasis added).

  The impression gleaned from the relevant EU provisions and their history is that while OTA provisioning was more of a "nice-to-have" afterthought for consumer mobile communications devices, such as smartphones or tablets, it was (rightly) considered indispensable for the expected large-scale growth of M2M communications. This is because some M2M devices can be very numerous and distributed across very diverse, unsupervised and inaccessible locations.

  Although this basic distinction makes sense, we believe that market developments will demonstrate eventually that OTA provisioning can play a more important role in the consumer segment than just yet another facilitator of number portability.

While the focus segment for OTA provisioning is M2M, the technology may also play an important role for consumers.

- **Mandatory provisions vs. "soft law" requirements**. The EECC requires NRAs to promote OTA provisioning but is open as to the means required to do so.

  Thus far, anecdotal evidence from the industry, such as operators' responses to national consultations, suggests there is very limited appetite for mandatory measures for eSIM cards or other OTA provisioning measures. This seems consistent with the idea that, since stakeholders from different sides of the industry (telcos, M2M industrial customers, device manufacturers, consumers and regulators) seem to be in agreement about the overall benefits of OTA provisioning, its further promotion can take care of itself, as long as it does not face any regulatory, competitive or technical obstacles. If this assumption

NRAs may wish to focus on removing obstacles for the introduction of OTA provisioning rather than developing new regulations

is correct, regulatory intervention should focus on the removal of any such obstacles, as long as they are unnecessary or disproportionate.

- **Adjustments to number portability rules**. In the consumer sphere, OTA provisioning is expected to contribute to a smoother end-user experience when switching to another operator. In line with the EECC, NRAs should also review whether OTA provisioning, even as a voluntary option, requires any adjustments to the details of the current switching and porting processes and regulations. NRAs should, in particular, and in line with Article 106(6) EECC, aim to ensure that consumers remain in control of the process, are not switched without their consent, and retain the right to refuse OTA provisioning of their subscription. This raises several questions, such as whether the distribution of eSIM-only consumer devices should be subject, ex ante, to additional mandatory consumer protection safeguards (e.g., a requirement for SMS confirmation by the consumer prior to porting) as well as the exact scope of consumers' rights in respect of different types of OTA intervention on their eSIM card (e.g., what about mere technical upgrades?) and any associated need for opt in/opt out clauses.

  While number portability is crucial for the consumer segment and already regulated as such, it is much less so for M2M applications. The subscriber of the number used for M2M communication is normally not the end-user, and the value of keeping a certain number while changing M2M service is not obvious – even though there may be potential exceptions for certain use categories. However, the parallel growth of personal communications and M2M devices is bound to lead to grey zones (e.g., for wearables) and eventually overlaps. The industry may be keen to explore these in order to maximize economies of integration and scale, but also sell the advantages of multiple device connections (for combined personal and M2M communications) under a single subscription.

  Therefore, future-proof regulation may need to redefine the exact scope of number portability rules and the conditions under which these may also extend to other types of numbers and devices, currently not targeted as such for number portability purposes.

Overall consistency should be ensured with other related areas of regulation (e.g., MNP).

- **Interface with other areas of regulation**. Any regulatory measures on OTA provisioning, whether mandatory or voluntary, must take into account the impact of neighbouring areas of regulation. At a minimum, NRAs should avoid inconsistencies and ensure clarity on the interface between such neighbouring sets of rules.

An obviously related area concerns the management of numbers for IoT/M2M, as some of the requirements associated with the use of E.164 numbers are inappropriate for most IoT/M2M connected services. This is an ongoing debate. Other related areas may concern the data stored and managed on eSIM cards (remote access to such data and easier cross-border roaming inevitably increases cybersecurity risks, as well as the need for data protection).

3. Main challenges for the implementation of OTA provisioning

OTA provisioning, together with eSIMs, has for long been praised for the potential benefits it may bring to consumers and, especially, M2M users, such as interoperability, seamless switching, quick porting, cost-savings, efficient supply chain, etc. This perception was also shared by the European Commission who asked NRAs to promote its adoption at national level.

Key challenges for OTA provisioning include the need for standardisation, dealing with security threats, and inter-operator compatibility.

However, the realisation of these benefits is going to be highly dependent on how well global actors (including international organizations, regulators, operators, manufacturers etc.) join forces to overcome a number of challenges inherent to OTA provisioning, among which we can highlight the following:

- **Ensuring collaboration from mobile operators:** In order for OTA provisioning and remote switching to truly scale, mobile operators will need to adapt their business models and embrace the adoption of eSIMs. As eSIMs do not require a link from end-user to a specific network carrier, mobile operators may fear losing touch points with their customers, and hence also potential revenue from loyal customers and roaming charges.
- **Changing geographic regulations and standards**: Regulators and government bodies will need to play an important role in order to ensure that any existing or future standards and regulatory measures promote the growth and adoption of OTA provisioning. Businesses and IoT use cases are becoming more and more global and borderless, and regulatory challenges pertaining to profile switching and permanent roaming often act as barriers for deployment based on eSIM devices.
- **Complexity of, and trust in, the process**: Due to the relative novelty of the topic of eSIMs and OTA provisioning, standardising the whole ecosystem to ensure interoperability is still an issue. Standardisation will need to be enforced on a national level and also supported by international bodies such as GSMA, ITU, etc., in a way that should enable every eSIM to be managed by any service provider in any device. Such interoperability standards are critical in order to bring different stakeholders in the industry to work together in a trusted manner.

- **Security**: The biggest argument against eSIMs and OTA provisioning is about security, due to the sensitive nature of the data being dealt with. Potential risks such as SIM swap attacks, eSIM profile tampering or IP-based attacks on infrastructure (e.g., smart meters, connected cars) need to be dealt with in a standard and secure manner.
- **Complex or faulty design process**: Given the industry's lack of familiarity with OTA provisioning, the processes related to it must be carefully designed taking into consideration users, use cases, experience, etc. If the customers or systems cannot navigate the processes, or if faulty processes are launched in the market, this could restrict the full capabilities OTA provisioning can ideally provide.
- **Return on Investment**: The costs and benefits associated with investing in eSIM-based deployment, especially in the light of decreasing mobile data and roaming prices from the perspective of telecom operators, pose definite threats to the commercialisation of OTA provisioning. Even if eSIM manufacturers, such as G+D, Thales, IDEMIA, etc. are investing significantly in eSIMs, telecom operators have been cautious in committing investments in this area. This is also relevant for equipment manufacturers and IoT module manufacturers who need to take the decision to invest in eSIM-based design and platforms.

4. Conclusions

OTA provisioning is expected to bring in significant benefits to the electronic communications industry, especially in the M2M segment (e.g., simplified management of subscriptions, simplified international roaming and simplified number portability processes). Still, its adoption is at an early stage and its prospects are work-in-progress – most likely as a result of some of the challenges described above, which threaten to reshuffle cards in the industry.

While most stakeholders seemingly agree on the benefits this technology may bring and the need to implement it globally, OTA provisioning may still require some time to become widespread. In the meantime, NRAs would be well advised to carefully assess the regulatory environment surrounding implementation of OTA provisioning, and identify any potential early threats, bottlenecks and areas calling for regulatory intervention.

5. About Axon Advisory

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Axon has in-depth familiarity with the ICT markets in Europe, through ongoing work in all EU countries and frequent collaboration with the EC in major consultancy projects.

Analysts Team at Axon Partners Group[2]

[2] The views and opinions expressed in this article are those of the authors and do not necessarily reflect the view of Axon Partners Group.