TATA COMMUNICATIONS

MVNE MODEL FOR AUTOMOTIVE OEMS

APPLYING AN MVNE MODEL TO OVERCOME THE CHALLENGES OF GLOBAL VEHICLE CONNECTIVITY

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Executive Summary

Automotive OEMs have a strategic opportunity to gain full control over the connectivity solution embedded in their vehicles. This will help OEMs unleash innovation and maximize the potential of connected services, along with the revenue that these services generate. To best achieve this objective, OEMs need to be less restricted by traditional multi Mobile Network Operator (MNO) approaches toward connected vehicle programs.

With the emergence of the Mobile Virtual Network Enabler (MVNE) model, OEMs have the option to build an optimized and scalable connected vehicle solution. To reduce the dependency on MNOs and preserve revenue potential against platforms like Android Auto and others, OEMs can use the capabilities of an MVNE to stay in control of their vehicle connectivity and associated business and user experience.

Challenges with the Traditional Multi-MNO Approach

Today, OEMs typically have multiple service agreements with large MNOs for different regions. An example might be working with Deutsche Telekom for Europe, AT&T for North America, Telefonica for South America, and China Unicom for Asia. Consequently, OEMs do not manage their connected vehicles and related services themselves. This is a risky approach, with various challenges related to network complexity, vendor lock-in, expensive and time-consuming network integration, and lack of flexibility and security.

Network Complexity and Lock-in

Typically for each MNO, two integrations need to be performed:

1. Integration with the IT system and core network
2. Integration with the SIM vendor's subscription management system

These integrations across multiple MNOs and regions become increasingly complex, leading to cost duplication and delays in rolling out connected vehicle services.

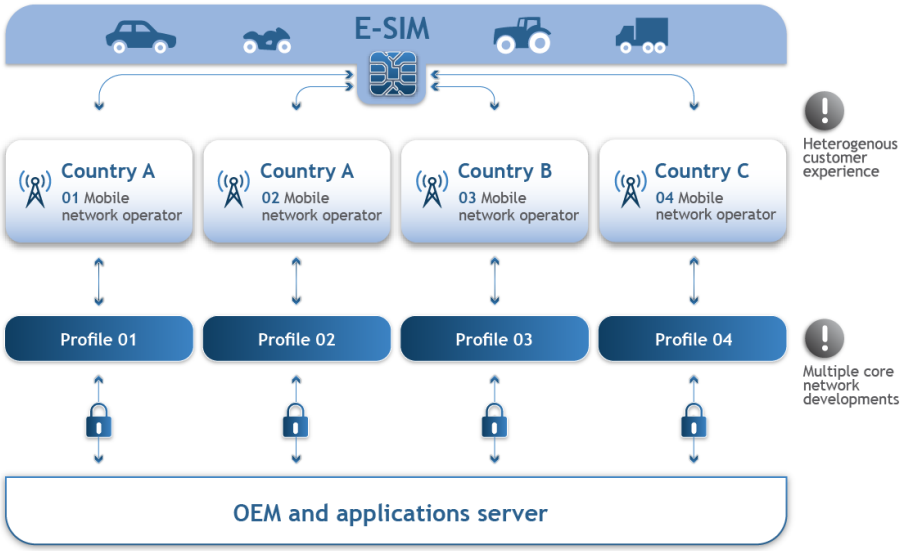
This approach also prevents the connected vehicle from latching onto another network in case of poor connectivity, as the MNOs control the steering of the preferred network. Due to this lock-in, OEMs cannot change the network or service provider without changing the SIM profile in the vehicle. OEMs also become vulnerable to potential quality and rate changes because of this lock-in.

With more regulatory restrictions emerging globally, there is an obligation on the OEM to comply with local network restrictions, Know-Your-Customer, and data sovereignty regulations. In some countries, e.g., China, Turkey, Brazil, or UAE, permanent roaming restrictions exist. To comply with regulations in highly regulated countries, a local profile is required, and onboarding of a local profile is only achieved through another complex and costly integration with a new, to-be-contracted MNO.

As OEMs move from telematics to additional services including data-intensive, customer experience-centric services, the cost of providing such services can go up in certain markets due to higher network costs. This especially becomes problematic in low-volume countries where roaming is necessary and may be very expensive.

Mobile networks are in transition. Globally 70+ networks have announced a 2G and/or 3G shutdown, while simultaneously 5G becomes increasingly more available. This network transition needs to be managed across countries while ensuring

continuity of service for all connected vehicle services. In such a heterogeneous environment, offering and launching new services become complex.



Fragmented Network Services and Quality

One challenge of working with multiple MNOs is how to deal with varying SLAs. MNOs have different networks with varying SLAs and require OEMs to work with different monitoring and ticketing systems, leading to inefficient, costly, and non-scalable operations for an OEM.

Aside from varying SLAs from MNOs, there are also multiple players completing the end-to-end value chain of connectivity such as the eSIM vendors and TCU vendors, often in different combinations with MNOs. These differences often result in different capabilities, causing complexity, extra costs, and potentially significant delays in the roll-out of connected services globally.

Benefits from an MVNE approach

OEMs today need to connect their vehicles on a global scale. For that, they need a flexible, cost-effective globally scalable solution. Instead of directly contracting local MNOs in all the different geographies, OEMs can choose the support of an aggregator like an MVNE (Mobile Virtual Network Enabler). An MVNE abstracts the complexity that comes with connecting to multiple MNOs and provides a “single pane of glass” integration and one consolidated operational interface across all networks.

The MVNE provides platform capabilities, network infrastructure, and related services, including account management, business support systems, administration, and operations support systems to a mobile virtual network operator (MVNO). An MVNE/MVNO typically does not own a radio infrastructure (antennas, frequencies, and licenses). It gains access to the Radio Access Network from Host MNOs to offer its mobile services to its customers.

No network complexity or MNO integration for OEMs

OEMs will benefit from the MVNE approach to launch new car connectivity services globally as they only need to connect and interact with one single platform. The MVNE platform takes care of complex integrations to the IT system and core network of the MNO and with the SIM vendor's subscription management platform. In the case of local regulations, MVNEs contract and integrate the right local partners to ensure compliance with their customers.

No Network Lock-In

As the MVNE is controlling the platform (or core network), an OEM will not experience a network lock-in situation, because switching connectivity between MNOs is a core value that MVNEs offer. Most commonly eSIM subscription management vendors and MNO systems are already pre-integrated via APIs to their platforms.

This is supported by a fully integrated eSIM vendor agnostic subscription management feature, that can easily be integrated with any eSIM subscription management platform from suppliers including Thales, Idemia, G&D, and Valid.

The MVNEs platform capabilities provide profile orchestration functionality to switch between MNOs automatically. New local MNOs can also be easily onboarded by the MVNE as needed, for example when entering highly regulated countries that require the usage of a local profile. The MVNE will take care of the individual requirements such as an Internet Service Provider License, KYC, or B2C services.

Simplified Operations

In terms of operations, an MVNE model presents considerable simplification for OEMs. It monitors the mobile networks and the entire online chain end-to-end globally across all MNOs in its Network Operations Center (NOC) and monitors the SLA with a central team and manages the ticket system behind it.

An MVNE monitors the current changes in the market, such as 2G and 3G network sunsets. to manage the network transition globally. At the same time, its independence ensures continuity for its customers.

MVNEs are independent of MNOs, so they can support OEMs better in the design of the services and enables OEMs with greater agility and customized connected services. This can significantly shorten the time to market and save cost as deployment is managed from one interface and platform.

TATA COMMUNICATIONS OFFERING

Tata Communications MOVE™ - Intelligent Connected Vehicle Platform

Tata Communications MOVE™ is an MVNE platform. It offers all the benefits an MVNE can offer combined with robust high-grade connectivity options globally and comes pre-integrated with 80+ leading MNOs, providing access to ~600 MNOs across 200 countries.

Tata Communications MOVE™ is the connectivity management platform that abstracts the complexity of the highly fragmented MNO landscape and provides a single interface to OEMs for monitoring, control, and insight. The platform allows OEMs to manage their existing MNOs and add new MNOs all on one platform, via a single interface "Single Pane of Glass" (SPOG), thus greatly simplifying operations and lowering costs. The SPOG interface is designed with an API-first approach and can therefore be deployed and used through its own native User Interface or can be integrated into an existing OEM control system.

The additional ability to merge your existing MNO partners on the same platform “Bring Your Own Network” (BYON) enables OEMs to onboard their own current or future connectivity partners without changing their existing contractual arrangements. This also allows for easy onboarding of new MNOs, as and when OEMs' business objectives require new partners. This way OEMs can choose what contracts they want to manage themselves and what available network integrations they want to use from the platform, for instance for long-tail, low-volume countries. In addition, the already integrated and contracted MNOs can provide backup options in parallel to OEM contracted MNOs in selected regions.

In addition to SPOG and BYON, Tata Communications offers a unique eSIM inter-operability hub. This is a powerful eSIM subscription management agnostic module, that dynamically manages the right connectivity at the right time, and place and is completely supported for automatic network switching through an advanced business rule engine.

The eSIM Hub also supports “Bring your own eSIM vendor” via existing ES1 integration to all major vendors and associated SM-SR. Tata Communications MOVE™ includes its own SM-SR, SM-DP, and SM-DP+ instance.

CONCLUSION

Automotive OEMs encounter increasing challenges in managing their connected fleets. Traditional MNO-based models are inflexible, don’t scale well globally, and aren’t cost-effective. New platform offerings from MVNEs, abstract the network complexity and fragmentation, offer a single interface to manage the connectivity needs, and allow for expansion and flexibility across networks, creating competitive advantages for deploying connected services across their fleets globally.

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About Tata Communications

Tata Communications Limited (CIN no: L64200MH1986PLC039266) along with its subsidiaries (Tata Communications) is a leading global provider of A New World of Communications™. With a leadership position in emerging markets, Tata Communications leverages its advanced solutions capabilities and domain expertise across its global and pan-India network to deliver managed solutions to multi-national enterprises, service providers and Indian consumers.

The Tata Communications global network includes one of the most advanced and largest submarine cable networks and a Tier-1 IP network, as well as nearly 1.5 million square feet of data centre and collocation space worldwide.

Tata Communications' depth and breadth of reach in emerging markets includes leadership in Indian enterprise data services and leadership in global international voice.

Tata Communications Limited is listed on the Bombay Stock Exchange and the National Stock Exchange of India.

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