An essential guide

DEPLOYING A SUCCESSFUL CONNECTED CAR STRATEGY IN THE ASIA PACIFIC

Singtel

Contents

Asia presents a huge opportunity for automotive manufacturers looking transform their business models and create new revenue streams with connected cars. However, companies planning to roll out their connected car strategy in the region will have to be prepared to deal with market fragmentation in a region characterised by diverse cultures and regulatory frameworks, different mobile network operators dominating in different markets, and uneven infrastructure maturity.

To navigate these complexities and ensure they have sufficient coverage for their connected car strategy, there are two important decisions that automotive manufacturers will have to make.

CREATING NEW VALUE WITH CONNECTED CARS

The connected vehicle is sparking an evolution of existing business models in the automotive industry, heralding a change in the value of a car from a static product to a dynamic one.

A connected car is equipped with Internet access, often including a wireless local area network to share data with devices both inside and outside the vehicle. For automotive manufacturers, this creates opportunities for new revenue streams focused on connected services, and allows them to reframe customer engagement in terms of long-term value creation instead of immediate profit.

Revenue opportunities from connected cars include:

Provision of connected car services
Automotive manufacturers can offer, operate and maintain a range of services that could be a selling point for their cars and also improve the lifetime value of the vehicle. For example, with a connected car, in-vehicle systems can be improved with over-the-air (OTA) upgrades.

Examples include systems for safety and traffic management, car surveillance and tracking, congestion avoidance, advanced response to road conditions and weather, autonomous driving and many more.

This opens up the possibility of greater price elasticity and more flexible payment models for vehicle ownership – lowering the entry price for a car and offering customers the ability to upgrade the specifications later on.

CREATING NEW VALUE WITH CONNECTED CARS

Delivery of third-party services
Integration of third-party services into the connected car platform creates opportunities for monetisation through different models such as commission, revenue sharing, or platform subscription by the service provider.

Examples include the delivery of new and enriched in-vehicle services such as wireless internet, content streaming, retail purchase tie-ins, parking location and payment services, event booking, dynamic navigation map updates, concierge services and many more.

Data monetisation
Data captured from connected vehicles such as driver behaviour, passenger activity, preferences and location can be made available to third-party service providers and other partners to inform service personalisation and improvement efforts.

The automotive manufacturer can also leverage the data in its own product development and continuous engineering efforts and also to reduce operational costs. For example, predictive failure analysis allows for more efficient scheduling of maintenance tasks and allows parts to be ordered on a just-in-time basis.
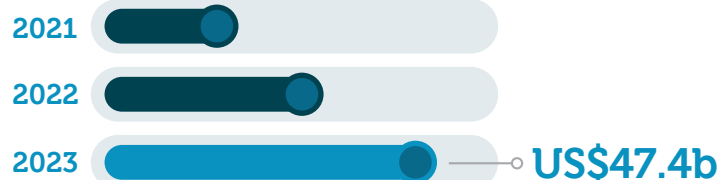
Data captured from connected vehicles such as driver behaviour, passenger activity, preferences and location can be made available
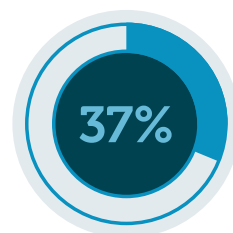
THE CONNECTED CAR OPPORTUNITY IN ASIA

Asia presents a huge opportunity for connected vehicles and there is strong interest amongst automotive manufacturers to develop and roll out their connected car strategies in the region.
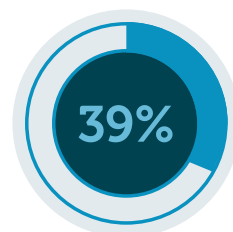
37% of consumers will switch car brands for improvements in connectivity

37%

39% are interested in unlocking additional digital features after purchasing a vehicle[2]

39%

2021
2022
2023 — **US$47.4b**

The Asia-Pacific connected vehicle market to expand at a compound annual growth rate of 20% to US$47.4 billion by 2023[1]

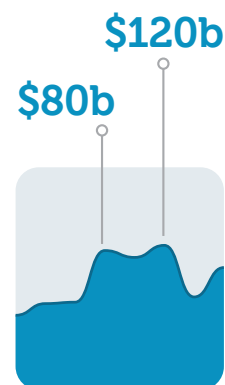The total revenue pool for connectivity services across the region could range between $80 billion and $120 billion by 2030[1]
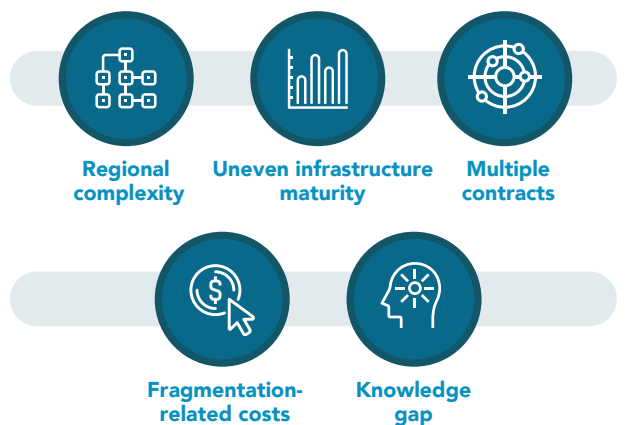
$120b
$80b

POTENTIAL ROAD-BLOCKS

At the heart of a connected car strategy is a cloud-based vehicle connectivity platform working on 4G and 5G to unite infotainment systems, automotive application frameworks, and connected car data infrastructure into one system and to enable V2X communication[4].

As companies roll out their connected car strategy in Asia, one of the key things they will need to do is to ensure seamless and uninterrupted regional mobile connectivity for their vehicles.

As they work towards this, there are some challenges that they should be prepared for.

Regional complexity

Uneven infrastructure maturity

Multiple contracts

Fragmentation-related costs

Knowledge gap

Regional complexity

Unlike the European Union or the United States, the Asia Pacific region comprises many independent countries, each with its own regulatory agencies and mobile network operators (MNOs).

The diverse markets make fragmentation a major challenge. Services may have to be developed in the country's national language, and companies will also have to deal with different industry requirements and legal limitations.

[1] Menafn, Asia-Pacific Connected Vehicle Market: Industry Outlook By Drivers, Restraints And Opportunities 2020 To 2023, 2020
[2] McKinsey, Asia's consumers on the move: The future of mobility, 2021
[3] McKinsey, Asia's consumers on the move: The future of mobility, 2021
[4] Intellias, Big Data for Connected Car Platforms: What's Under the Hood?, 2020

POTENTIAL ROAD-BLOCKS

Knowledge gap

Companies are often faced with a knowledge gap when navigating the domestic requirements and regulations of each country. For example, hardware qualification guidelines for each country differ. Some require testing to be done in-country while others may accept findings based on tests conducted elsewhere.

Countries also differ in IoT security certification requirements. For example, Japan has its Cyber/Physical Security Framework, while Singapore has its IoT Cyber Security Guide. Certain countries require IoT devices to be certified secure-by-design. Data privacy regulations also differ, with some countries being stricter than others.

Multiple contracts

To ensure sufficient coverage for connected car devices across the Asia Pacific, automotive manufacturers may need to work with multiple MNOs operating in different countries across the region. In some countries, it is a requirement for them to contact with a local entity.

> **Companies are often faced with a knowledge gap when navigating the domestic requirements and regulations of each country**

Working with multiple MNOs involves multiple points of contact and dealing with different operational processes and contract agreements, adding significant complexity to billing and contract management. Different MNOs may also have different SIM management and billing systems, and work may be needed to integrate these with the automotive manufacturer's connected car platform.

POTENTIAL ROAD-BLOCKS

Fragmentation-related costs

The need to cater to the different requirements of each country drives up deployment costs significantly when different solutions have to be found or deployed for each market, so companies are unable to leverage the economic benefits of scale.

For example, the company may need to perform hardware tests and have their devices certified to meet the rules of different countries. Software's privacy perimeters may have to be adjusted to comply with local legislation.

To add to this, shipping connected devices to different countries may involve managing different device variants and SKUs meant for specific countries. From an operational perspective, the company also faces the prospect of high roaming costs to maintain connectivity with its cars and devices in different markets.

Uneven infrastructure maturity

Countries across the Asia Pacific have different levels of IoT readiness in terms of cloud adoption and the availability of 5G commercial services.

Countries in the region are progressing at different levels in rolling out their 5G network.

While the digital divide for cloud readiness is starting to narrow according to The Cloud Readiness Index 2020 by the Asia Cloud Computing Association, countries in the region are progressing at different levels in rolling out their 5G network.

Some countries like South Korea, Singapore, Japan, Hong Kong and Taiwan have already rolled out commercial 5G services but in some others, the deployment of 5G is being slowed down by geographical issues, the cost of spectrum auction, large infrastructure investment requirements, and the need to educate consumers about the network's benefits.

CRITICAL DECISION POINTS

4.1 Evaluating your connectivity options

For their connected cars and ecosystems to work across the Asia Pacific, automotive manufacturers need to source for connectivity to ensure they have sufficient coverage. There are three options[5] for this:

4.1.1 Roaming solution

Contract with a single MNO and leverage its global roaming agreements across different markets in the Asia Pacific.

The roaming solution is the easiest to deploy, but it involves challenges around regulation, data sovereignty, and customer support. Connectivity costs will also be expensive despite roaming agreements.

Pros
- Fast deployment • Single Contract

Cons
- Cost not scalable for higher bandwidth
- Best efforts support model
- Regulatory and market specific challenges with permanent roaming
- Data sovereignty issues

4.1.2 Multiple contracts with MNOs

Contract with individual MNOs in each market.

Pros
- Local market knowledge and support model Local costs
- Regulatory compliance

Cons
- Slower time to market
- Fragmented solution
- Multiple contracts and MNOs to manage

[5] Source: Bridge Alliance, Navigating APAC's fragmented IOT landscape, 2020

CRITICAL DECISION POINTS

4.1.3 Multi-domestic approach with a single lead operator

Contract with a single MNO who can provide localised connectivity through an eSIM (embedded SIM or embedded Universal Integrated Circuit Card) solution, delivering local connectivity across multiple markets.

Pros
- Fast deployment
- Single contract and central billing
- Harmonised solution with a single view across all markets
- Local costs
- Local support model with central coordination
- Addresses majority of regulatory and data issues

Cons
- Not yet available globally - still in deployment phase
- Some remaining challenges in countries with stricter regulatory regimes

Src: Bridge Alliance, Navigating APAC's fragmented IOT landscape, 2020

4.2 The case for a multi-domestic approach

To support a successful connected car strategy in the Asia Pacific and facilitate its rollout across the region, it is highly recommended that automotive manufacturers adopt a multi-domestic approach with a single lead operator providing a robust managed regional IoT connectivity solution. The multi-domestic approach presents the following advantages.

4.2.1 Simplifies deployment with single lead operator

The multi-domestic approach provides a simplified model for rolling out the connected car strategy. It allows automotive manufacturers to work with one operator to navigate the complexities of Asia both from a business and technical perspective.

There will be one master agreement and supplemental agreement with local providers with country-specific addendums. This eliminates the need to contract with MNOs and other service providers in each local country and can facilitate a central or local country billing arrangement. It also streamlines service delivery and customer support.

CRITICAL DECISION POINTS

4.2.2 Provides flexibility with eSIM
In a multi-domestic solution, device connectivity is enabled via the eSIM – a programmable subscriber identity module (SIM) that is physically embedded into a mobile device.

The eSIM is designed for the remote management of multiple communications service providers' profiles and is compliant with GSMA specifications. It is provisioned OTA with operator credentials, giving users the ability to change providers to avoid lock-in. OTA software updates also enable new software or firmware updates and/or configuration settings to be distributed to the vehicle' computing systems, including its infotainment systems and electronic control units.

4.2.3 Choosing the right lead operator
In adopting a multi-domestic solution, the choice of lead operator is an all-important consideration. The right operator, with deep knowledge of the region and established partner networks across the different markets, can help companies navigate the complexities of the region and simplify the processes involved in all aspects of the connected car programme rollout including deployment, management, contracts and billing, and customer support.

Remote car info & control

Secure connection

E-and-B-calls

Navigation maps

Digital concierge

OTA services

Realtime traffic info

Car drive functions

App store

Other infotainment services

Connectivity services for car manufacturers over a telematic APN

Connectivity services for internet access over an internet APN

Provided through a single eSIM

CRITICAL DECISION POINTS

As Asia's leading communications technology group, Singtel is well positioned to help automotive manufacturers succeed in the rollout of their connected car strategy in the region. The multi-domestic approach with a Singtel as the lead operator enables companies to:

Simplify Asia-wide connectivity with a single operator

The Singtel Multi-Domestic Connectivity Solution allows manufacturers to work with a single operator, eliminating the hassle of dealing with different partners and regulators and offering a single process to streamline operations, engagements, and activities, with one contract and a standard service level agreement across multi-domestic markets.

Leverage Singtel's local knowledge and experience

With deep knowledge of the local operator landscape and different in-country regulatory requirements, Singtel helps companies to navigate the diverse requirements across the region and harmonise the processes for distributing IoT devices across the Asia Pacific.

Tap into a ecosystem of top mobile operators in the region

As a founder-member of the Bridge Alliance, Singtel also works closely with local Tier 1 mobile network operators across the region to provide guidance on the regulatory requirements of each country and to arrange for localisation and in-country support.''

Singtel also works closely with local Tier 1 mobile network operators across the region to provide guidance on the regulatory requirements

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Collaboration across the Tier 1 MNOs also means that automotive manufacturers could benefit from eSIM swaps between MNOs. For example, under a collaboration between China Unicom and Singtel, enterprise customers of both companies are able to to perform eSIM changes over-the-air without having to manually configure their devices' SIM cards to change networks in either China or Singapore.

CRITICAL DECISION POINTS

Simplify billing through a unified process

As the lead operator, Singtel provides automotive manufacturers with pricing across the region and a unified process for billing. The harmonised commercial model, with competitive and simplified rates, provide manufacturers with pricing visibility to ensure the viability of connected services that they roll out to increase the lifetime value of their vehicles.

Manage all connectivity in real time through a unified portal

With the Singtel Multi-Domestic Connectivity Solution, manufacturers have access to a unified portal for managing all connectivity in real time.

The centralised, open integration platform is able to support all target markets with a single portal to manage core network and connectivity, monitor and manage the SIM connectivity lifecycle for all deployed countries, unify reports and analytics, and provide centralised monitoring and support.

Companies can also strengthen end-to-end security by taking critical IoT SIMs off the public Internet and subscribing to on-demand private IP connectivity to IoT devices.

These capabilities are made available through a one-time integration effort to deliver the same service, capabilities and experience across the manufacturer's footprint in the Asia Pacific.

Enjoy streamlined service delivery and customer support

The benefits of partnering Singtel as lead operator lie not only in the deployment of IOT devices for a connected car strategy, but also for streamlining ongoing service delivery and customer support.

For example, integration between the manufacturer's VSS and Singtel's support system allows tickets to flow directly to Singtel with information for analysis. With Singtel as the default profile for roaming countries, Singtel will follow up with the roaming partner for any issue related to the country of roaming.

CRITICAL
DECISION
POINTS

Leverage a core network optimised for IoT

Singtel's secure and programmable networks provide automotive manufacturers with a core network optimised for IoT. Cellular technologies comprising of 3G, 4G, CAT-M1 and NB-IoT networks cater to markets with different levels of IoT maturity and offer the widest coverage, most power-efficient and flexible connectivity required to support connected car platforms and strategies.

Simplicity and harmonisation

Single pane of multi-domestic view

Singtel

Unified Regional IoT Connectivity and Management

Localisation and in-country support

Managed regulatory compliance & security

About Singtel

Singtel is Asia's leading communications technology group, providing a portfolio of services from next-generation communication, technology services to infotainment to both consumers and businesses. For consumers, Singtel delivers a complete and integrated suite of services, including mobile, broadband and TV. For businesses, Singtel offers a complementary array of enterprise mobility solutions, data hosting, cloud, network infrastructure, 5G, IoT, analytics, robotics and cyber-security capabilities. The Group has presence in Asia, Australia and Africa and reaches 700 million mobile customers. Its infrastructure and technology services for businesses span 21 countries, with more than 428 direct points of presence in 362 cities.

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For more information   Contact us   www.singtel.com/business/iot