ACCESS™

NEXT GENERATION

# RADIO & AUDIO STREAMING

# EXECUTIVE SUMMARY

**• Audio is still the most favoured infotainment option for drivers and passengers alike and is going through an evolution with the addition of streaming.**

**• The first generation of connected cars have yet to fully integrate radio, streaming and BYOD services, leading to lower consumer satisfaction.**

**• The IVI will increasingly act as a primary interface for audio service aggregation and integration including control plane functions such as voice recognition.**

**• Value-added features - such as audio search and caching to overcome connection outages - are a considerable consumer benefit and enabled through IVI integration.**

**• A software and cloud-based approach increases flexibility for consumers and allows OEMs to make service and feature updates without requiring a dealer visit.**

The car radio is still the most widely appreciated form of in-vehicle entertainment. First installed in 1924 by Kelly's Motors in New South Wales, Australia, the earliest branded car radio was marketed by Motorola (a combination of "Motorised" and "Victrola", a leading brand of phonograph) in 1930, for the equivalent of $1,500 in modern terms. The popularity of the car radio continues to endure.

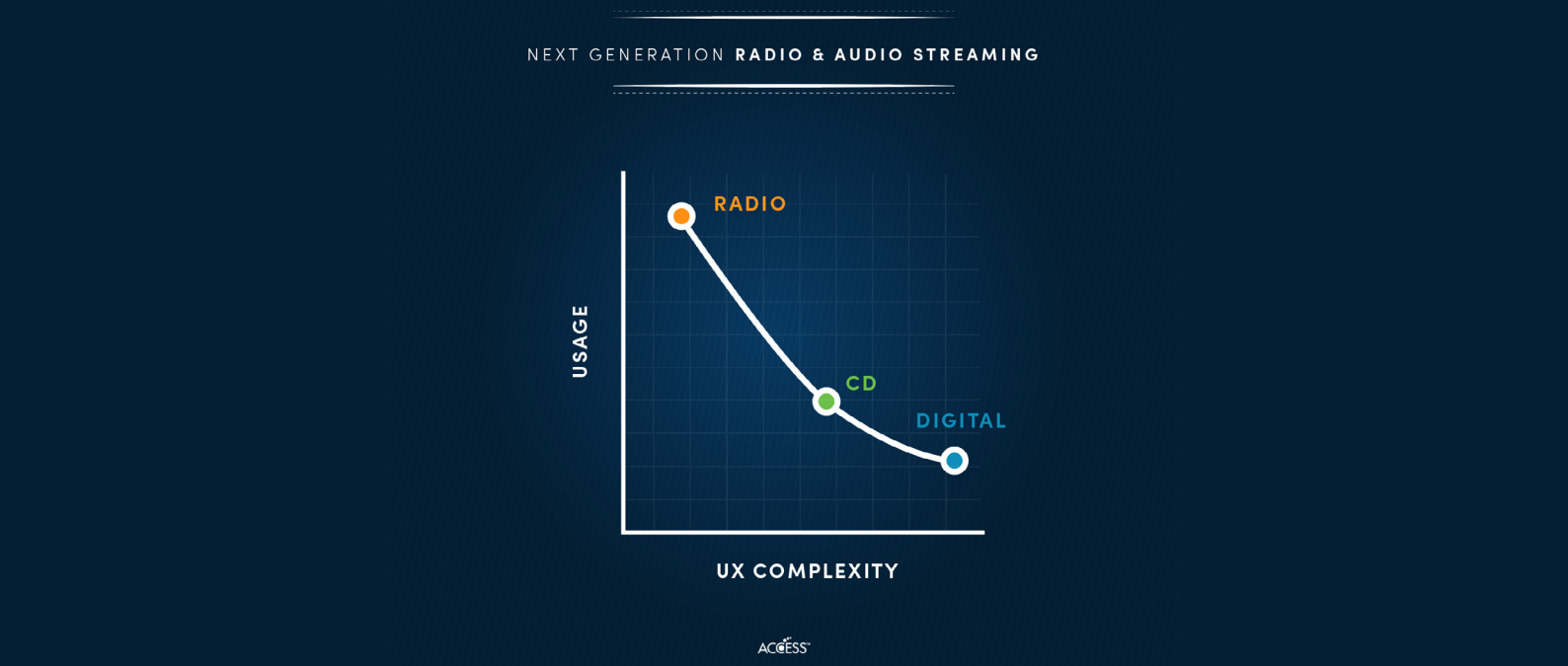
Today the in-car AM/FM/DAB/satellite radio and CD-player is still loved by drivers who, by law, must not be visually distracted while on the road. However, it's now possible for new techniques to enhance the in-car audio experience with customisation and location-based services, ensuring that in-car video won't completely kill the radio star for many years to come.

## Bring your own Audio

At present, consumers can access most of these new capabilities via bring-your-own-device (BYOD) options such as smartphones and tablets. However, as drivers will attest, integration between these devices and the capabilities within the car are limited at best. In most cases, users will link via Bluetooth to interface a smartphone audio input and output to the car. In this scenario, audio functions such as radio, streamed music, telephone call handling, turn-by-turn driver navigation, and traffic warnings are managed in a sometimes difficult to use ad-hoc manner.

However, as more rear seat passengers begin to access their own audio and video services via built-in screens, the current BYOD position is much less desirable. This ad-hoc solution makes it very difficult to guarantee reliable operation due to the differences between devices and operating systems within a growing diversity of services.

With the rise of the connected car including built-in 4G/5G connectivity, OEMs are moving towards an integrated IVI solution that offers the ability to blend their own services alongside audio offerings from the likes of Amazon and Apple within a seamless experience.




## Radio continues to dominate

According to research from Rajar in the UK that split out in-car listening:

- Live radio took 83.9% of all in-car listening
- CDs trailed far behind on 7.6%
- Digital tracks (downloaded MP3s) were on just 5.3%

The pattern is similar in the USA, according to 2017 Edison Research:

- AM, FM and satellite radio accounts for 71%
- CDs and digital music collections are on 15%
- Online radio is at 9%

We believe car drivers are choosing linear radio over MP3s, CDs or streaming services because of convenience, along with the fact that radio offers variety and spontaneity in its curated mix of music and information (such as news, traffic updates and weather). Even more importantly, the radio still provides an unrivalled user experience – you just press a button and it plays.

## Streaming future

The importance of digital audio playback and Internet streaming should not be underestimated. According to the 2016 IHS Auto Tech Consumer Survey, over half of millennial drivers (58%) listen to music from a BYOD device and are also twice as likely (44%) to listen to streamed audio services than the average. However, with over a dozen major streaming radio and audio service providers including Audible, Kindle, Pandora and Spotify, plus regional specialists, OEMs need to ensure that consumers can integrate their chosen service into the in-vehicle experience.


To meet this requirement, the IVI acts as a service abstraction layer to manage secure access to audio services as well as an in-car distribution platform for main speakers and headphones/screens for rear seat passengers. Through an open API, the IVI can manage either direct connection to cloud-based interfaces or as a host for downloadable apps. These services utilise the current 4G, and future 5G connectivity within each vehicle and overcome the traditional challenges of regional radio reception by providing services wherever there is a cellular network.

The IVI is a natural layer for the delivery of value-added features such as audio caching, so that as vehicles move through connectivity black-spots, audio streaming remains uninterrupted. The IVI is also increasingly used as the control plane for managing audio including dynamic search and control through practical methods such as voice recognition, using cloud-based technologies such as Amazon's Alexa and Apple's Siri.


Audio content search is likely to be a killer app for many drivers. The ability to request an artist, album or song and have it played instantly from a subscribed service is commonplace for home users. This is increasingly being built-in to the connected car as standard.

## Flexibility and choice

This voice control integration is crucial; it provides the driver with the freedom to access not just content but also control over dynamic services such as traffic updates, rerouting navigation services and other common tasks. As there is no single standard for all these options, the IVI needs the flexibility to allow the car owner to mix and match apps and services – and to adapt to emerging technologies.

To put this into context, Amazon Alexa has sold over 100 million devices in just four years and by 2020, experts predict its voice recognition technology may be used in half a billion homes. Consumers expect that a modern car will be able to integrate with emerging platforms like Alexa, which requires an IVI solution designed with flexibility in mind.

At present, the larger content gatekeepers such as Amazon, Apple and Google are vying for control of media distribution to the car. However, it could be argued that car manufacturers and consumers want both choice and the ability to change their minds. In a future in which cars have a subscription package for cellular connectivity and content, the ability to pick from a collection of audio, video and infotainment services seems like the best option to meet the needs and budgets of the widest range of consumers. This will replicate the way the Pay-TV industry has evolved its different bundles.

## Audio becomes video

With the emergence of autonomous vehicles on the near horizon, the infrastructure and systems put in place for audio offers a natural bridge for a future move towards video. The process steps of validating users, streaming digital data and playing back onto a device are similar for both types of media. In many cases, the changes required are simply interface updates that are maintained within a cloud portal. This approach makes it easier for OEMs to update entire brands and models of vehicles across every country, without having to apply any physical updates to the vehicle that could require a visit to a dealer.

The ability to remotely enable video, integrate services and charge a monthly subscription fee that includes cellular data plans offers OEMs and dealers an upsell potential for not just primary buyers but across the entire lifecycle of the vehicle.

**ACCESS Twine™ for Car (Twine4Car) offers a platform to augment traditional radio services with streaming audio and video that goes beyond technology. ACCESS can help automotive OEMs build business relationships and create profitable and successful multi-device systems and media services. ACCESS has already established - and is extending - multi-broadcaster content agreements that allows OEMs to offer a baseline in-vehicle content subscription that can be upgraded and regionalised as required.**

**Twine4Car enables OEMs to index audio and video content from multiple sources and content partners. The result is an embedded content service through one aggregation source but controlled and managed by OEMs – enabling them to provide the entertainment services their customers are asking for and maintain brand engagement through a truly multi-device experience.**

**It is important to recognise that Twine4Car is service, device and brand agnostic. This is a vital element in helping OEMs to deliver the most flexibility to their consumers and hedge against the issues that can arise as content providers and communication carriers vie for dominance in the future. As a pure platform operator with no advertising or data monetisation business model, ACCESS is ideally suited to helping OEMs solve the service delivery challenge while working within the broadest ecosystem of partners.**