

Big Tech and the connected car: The case for autonomous broadcast radio

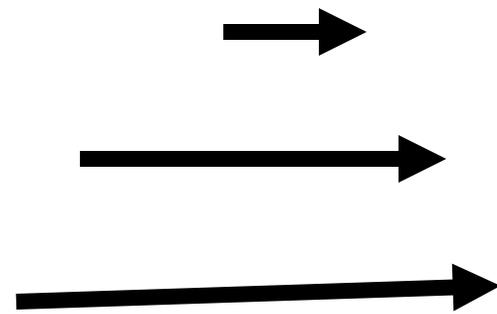
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STRATEGY ANALYTICS

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THE CAR IS BECOMING A SMART TV ON WHEELS

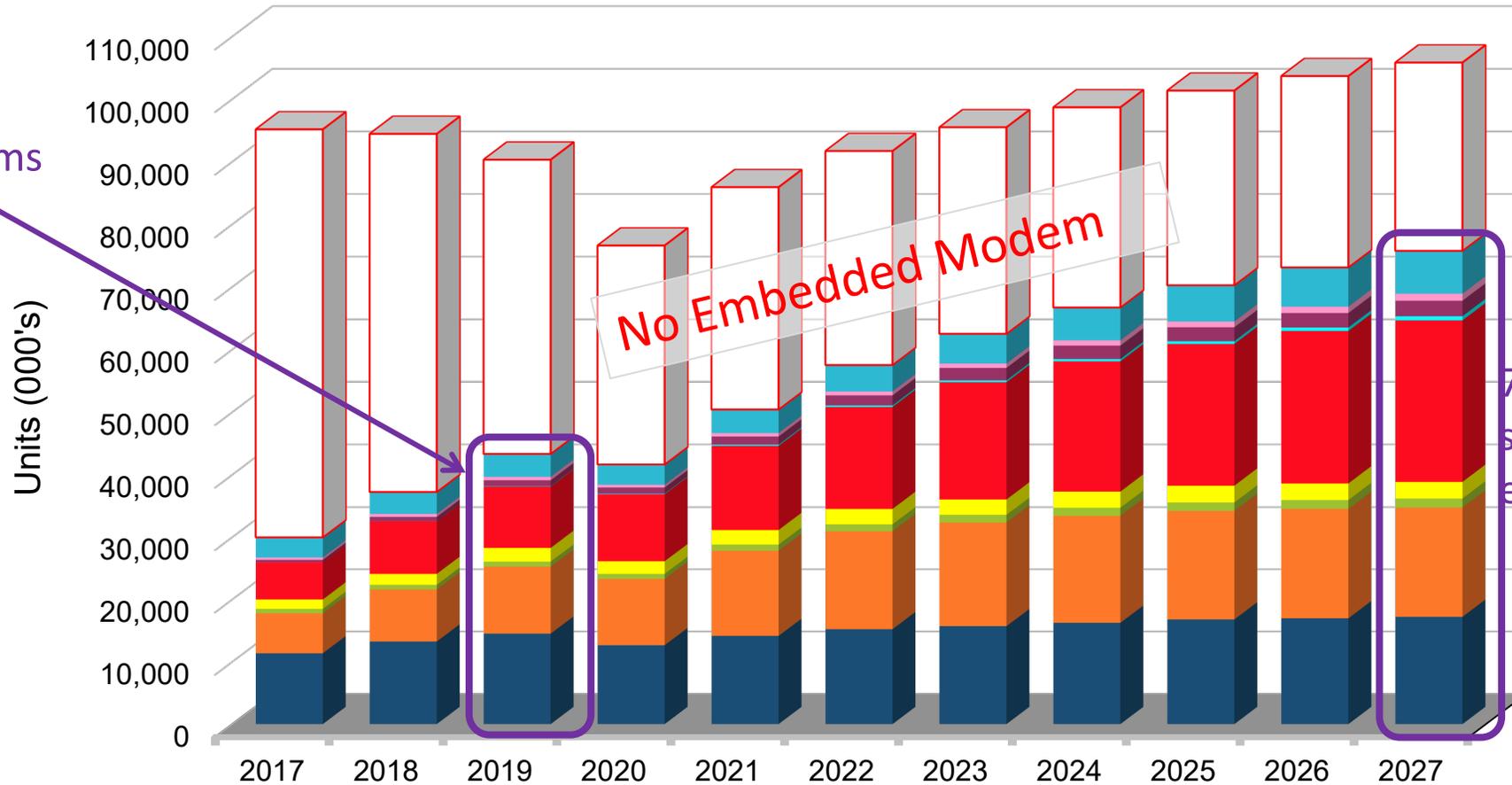


AUTOMOTIVE EMBEDDED MODEMS

GLOBAL ANNUAL SHIPMENTS



48.7% of vehicles shipped with embedded modems



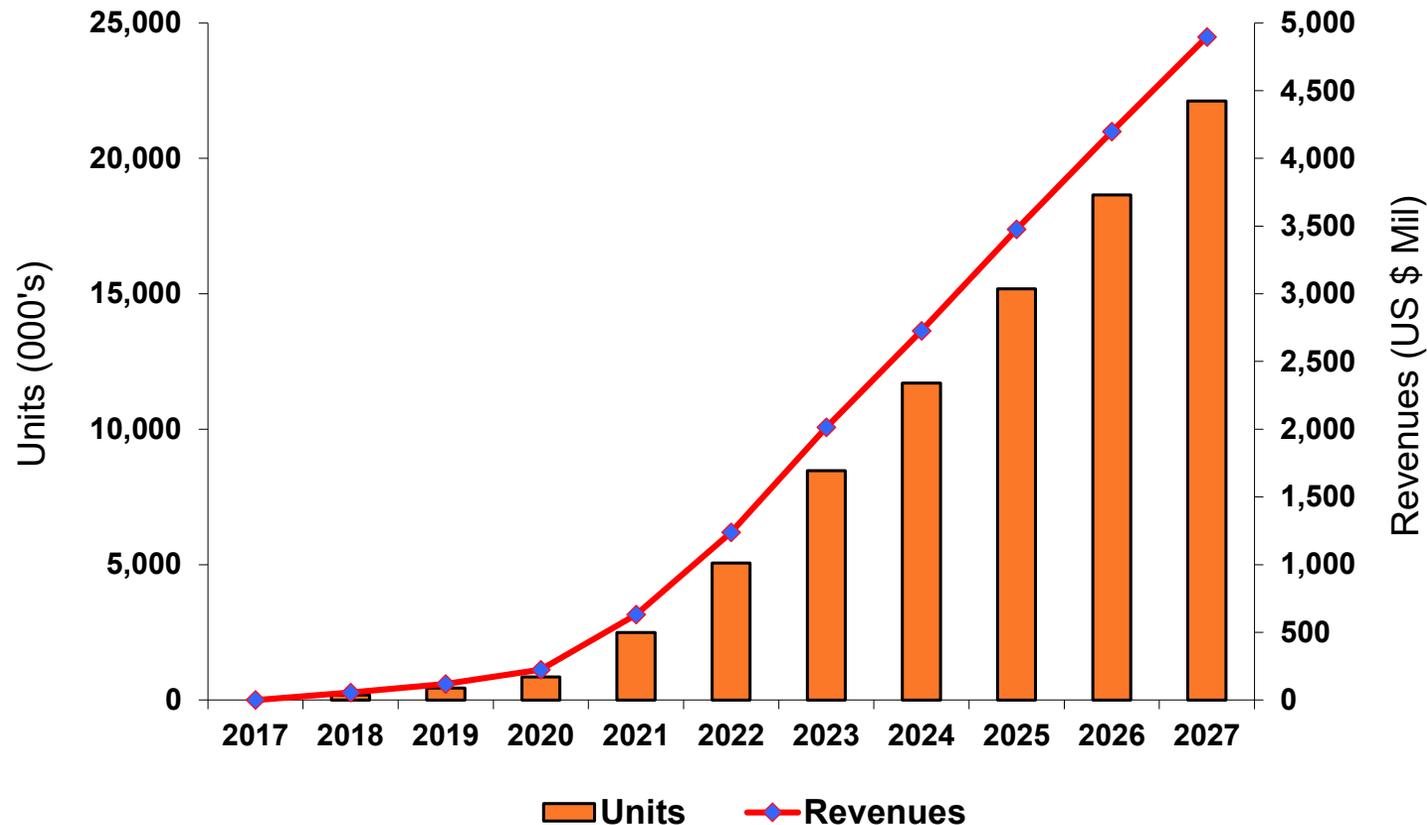
No Embedded Modem

72% of vehicles shipped will have embedded modems

■ North America
 ■ Europe
 ■ South Korea
 ■ Japan
 ■ China
 ■ India
 ■ Russia
 ■ Brazil
 ■ Rest Of the World
 ■ Not Connected

COCKPIT DOMAIN CONTROLLER ECU: OEM GLOBAL SHIPMENTS UNITS AND REVENUES

Cockpit Domain Controller (CDC) ECU Opportunity



- **CDC Shipments 2019 vs. 2027:**

- 440,000 Units in 2019
- 22.1 Million units in 2027

- **CDC Revenues 2019 vs. 2027:**

- \$120 Million in 2019
- \$4.9 Billion in 2027

Average Selling Price

2019: \$271/unit → 2027: \$221/unit

Note: CDC's integrate the traditional headunit functions of audio, radio and connectivity with the ability to drive one or more clusters from a single ECU



Voice-based **digital assistants** are rapidly bringing limited types of AI to our cars and our homes – **AND access to streaming radio content.**

- **Amazon Alexa**-enabled devices, such as the Echo smart speaker (pictured at right) are selling in large volumes.
- Strategy Analytics' Smart Speaker service estimates that full-year (2017) shipments reached **32 million units** in the U.S., France, Germany, and China.
- That figure is up **more than 300%** year-on-year.
- **Google** and **Amazon** accounted for **9 out of every 10 smart speakers** sold during that period.



Source: Amazon



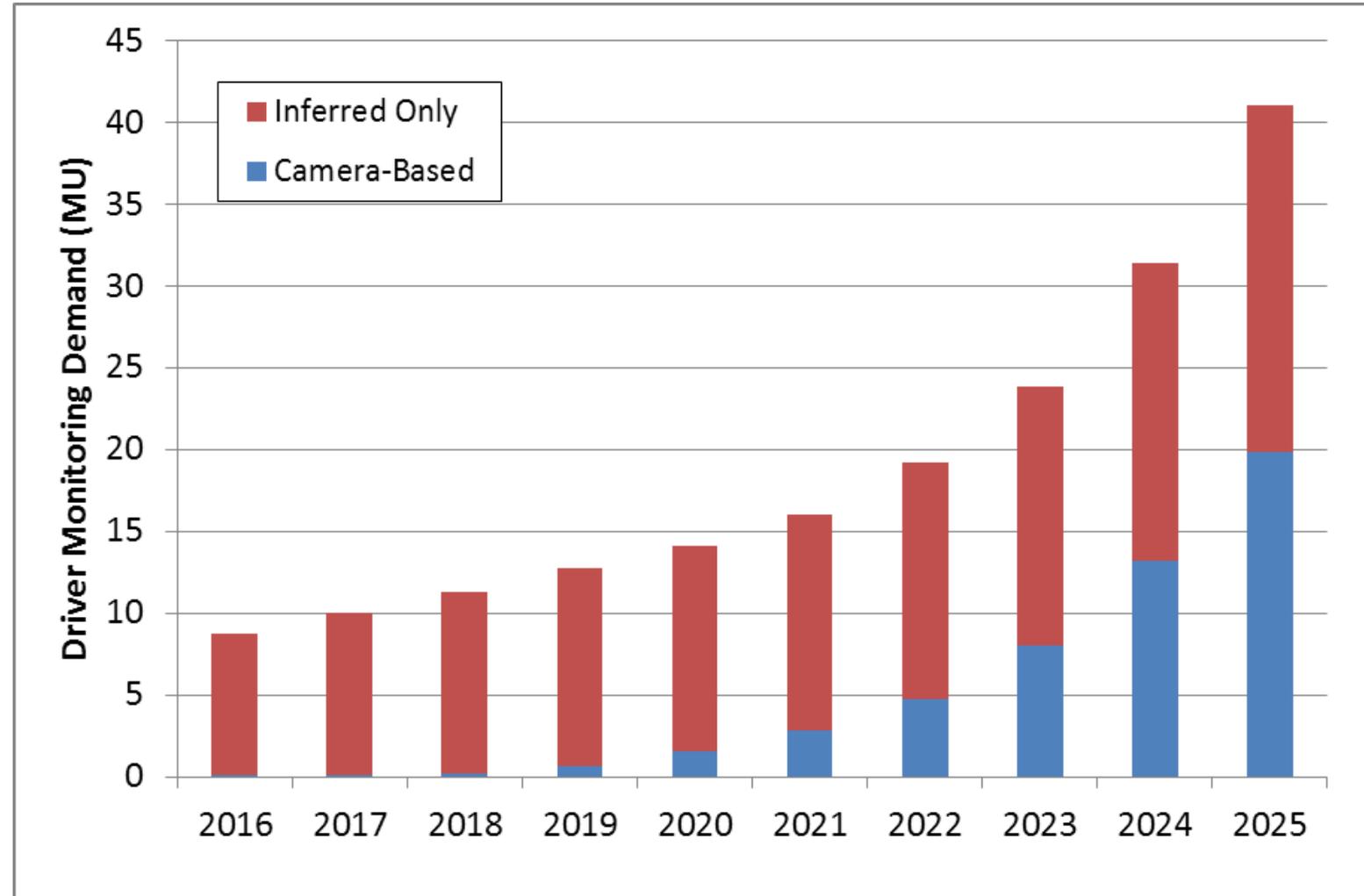
OEMS' INFOTAINMENT AI PARTNERSHIPS

OEM	Digital Assistant	Status
Audi	Alibaba's Tmall Genie, PIA	Tmall Genie – Launch TBD PIA – Concept demonstration
BMW/MINI	Amazon Alexa , BMW Intelligent Personal Assistant	Alexa – Launched (BMW Connected mobile app integration), launching in MINI cars, this year BMW Intelligent Personal Assistant – Used cloud services from Microsoft that underpin Cortana to develop this solution, i.e. Microsoft white label solution provider
Ford	Amazon Alexa	Launched
Honda	HANA, Honda Personal Assistant	Hana – demonstrated, developed via SoftBank partnership Honda Personal Assistant – developed via partnership with SoundHound
Hyundai	Amazon Alexa , Google Assistant, SoundHound's Houndify	Alexa and Google Assistant launched, Houndify launched in Hyundai Venue in India
Mercedes	Google Assistant, Amazon Alexa , Tmall Genie, SoundHound	Google Assistant, Amazon Alexa launched April 2017 SoundHound to launch
Nissan	Google Assistant	Google Assistant – part of Google Automotive Services, which Renault-Nissan-Mitsubishi Alliance has adopted.
PSA	SoundHound's Houndify	Launch was planned for 2020
SEAT	Amazon Alexa	Launched in 2017
Toyota/Lexus	Amazon Alexa , YUI	Alexa – Launched in 2018 YUI – concept demonstration
Volkswagen	Amazon Alexa	Planned, launch date not yet announced
Volvo	Amazon Alexa , Google Assistant, Siri, Alibaba's Tmall Genie	Alexa, Google Assistant, Siri, works with OnCall App Tmall Genie- launch date not yet announced



DRIVER MONITORING FORECAST

- Camera-based solutions forecast to deploy rapidly starting around now
- Legislative / NCAP interest in US and Europe
 - Europe NCAP for driver monitoring
 - US potential legislation for occupants left in hot vehicles





CAR CONNECTIVITY IS CHANGING WITH 5G

- Safety-centric collision avoidance applications
- Will enable enhanced content streaming capabilities
- Premium German auto makers introducing dual SIM dual access technology allowing car to be added to existing customer wireless plan and access OEM apps
- Electrification and semi-autonomous vehicle operation will mean not only more connected cars – but more connected cars that are actually connected
- Driving will increasingly become a connected experience for road hazards, charging station locations, status of charge, weather, traffic, and parking information
- User interfaces will shift to voice + gesture
- Service-Oriented Architecture

- **Radio must adapt to this new contextually aware driving experience**



CAR AS A (CONTENT DELIVERY) PLATFORM

- Google – Googlemaps, Places/POIs, Search, Youtube
- Apple – Map, Itunes, Podcasts, Apps
- Amazon – Alexa, Amazon Prime
- SiriusXM – Satellite radio
- Alluto - WebOS
- Xperi – Radio as a service
- Harman – App store
- Tesla – Autopilot

- Netflix? Disney? HBO?



TRANSFERRABLE EXPERIENCES

- Enabled by cloud-connectivity-centric architecture
- Consumer preference for familiar user interfaces
- Need to accelerate deployment and evolution of new experiences – content management, contextual awareness, safety

- Post-COVID – the return of the car as the FOURTH screen (home, office, mobile)



WHAT MATTERS MOST NOW?

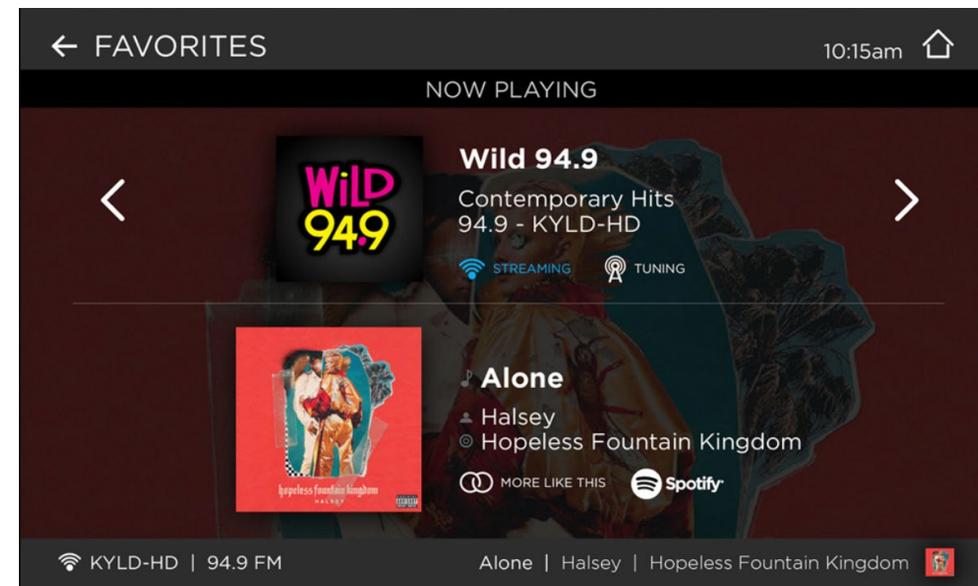
- Meta data
- Ad insertion
- Audience measurement
- Attribution
- Searchable, discoverable content
- Recommendation engines



COMPETITIVE LANDSCAPE – MUSIC & MEDIA IN THE CAR

Xperi

- Dominant global metadata platform
- Touting music ID, station ID, sports event info
- Targeting personalization, location relevance
- Broadcast and streaming solution
- Most comprehensive global metadata resource
- Acquisition of Tivo only added to its leadership
- Enabled searchability of all digital content





NEW PLAYERS – CONTENT MANAGEMENT

- **Audioburst**
- **Radioline**
- **Radioplayer**

Tech Enablers:

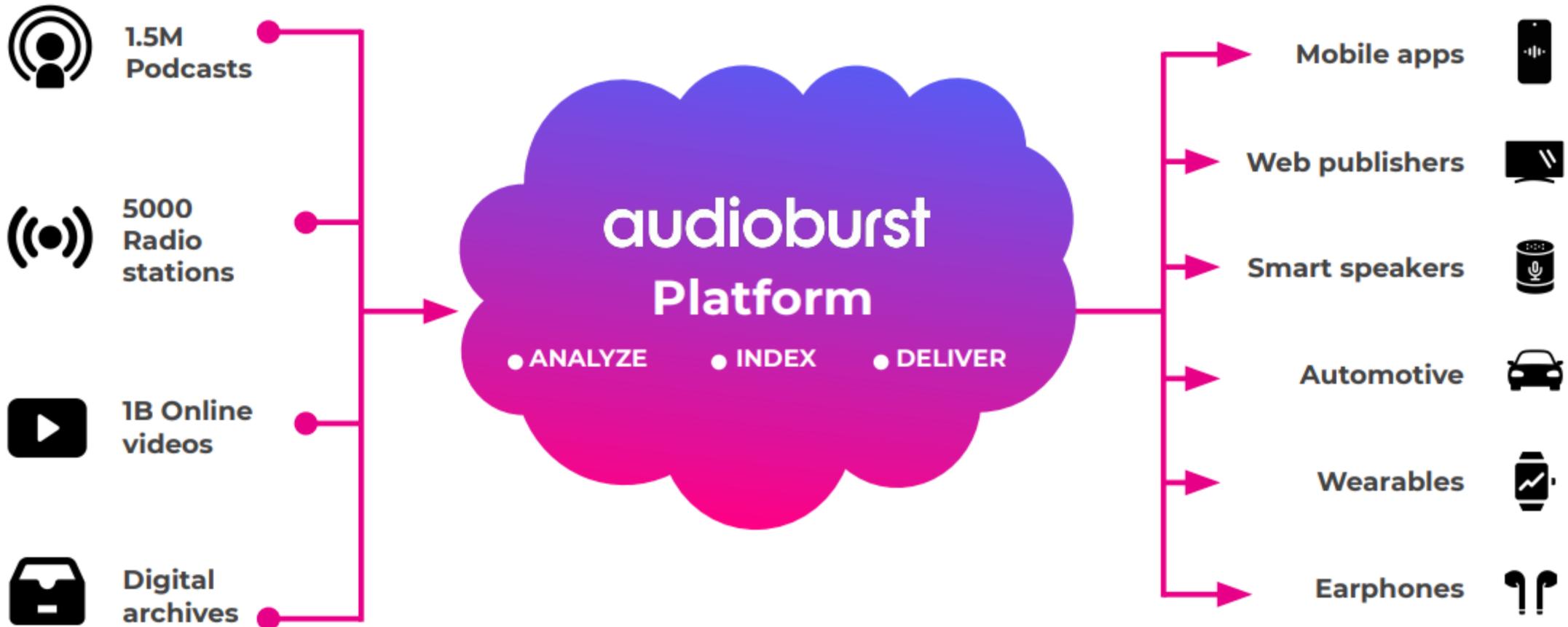
- **Pluxbox**
- **Quu**
- **Instreamatic**





AUDIOBURST PLATFORM

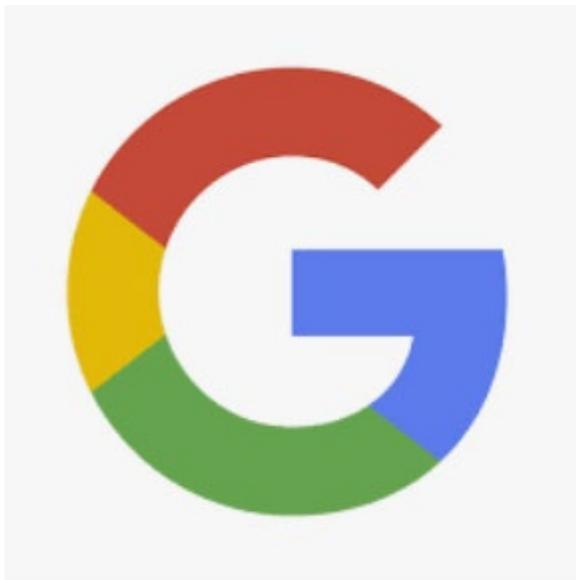
Indexing and delivering the world's talk audio





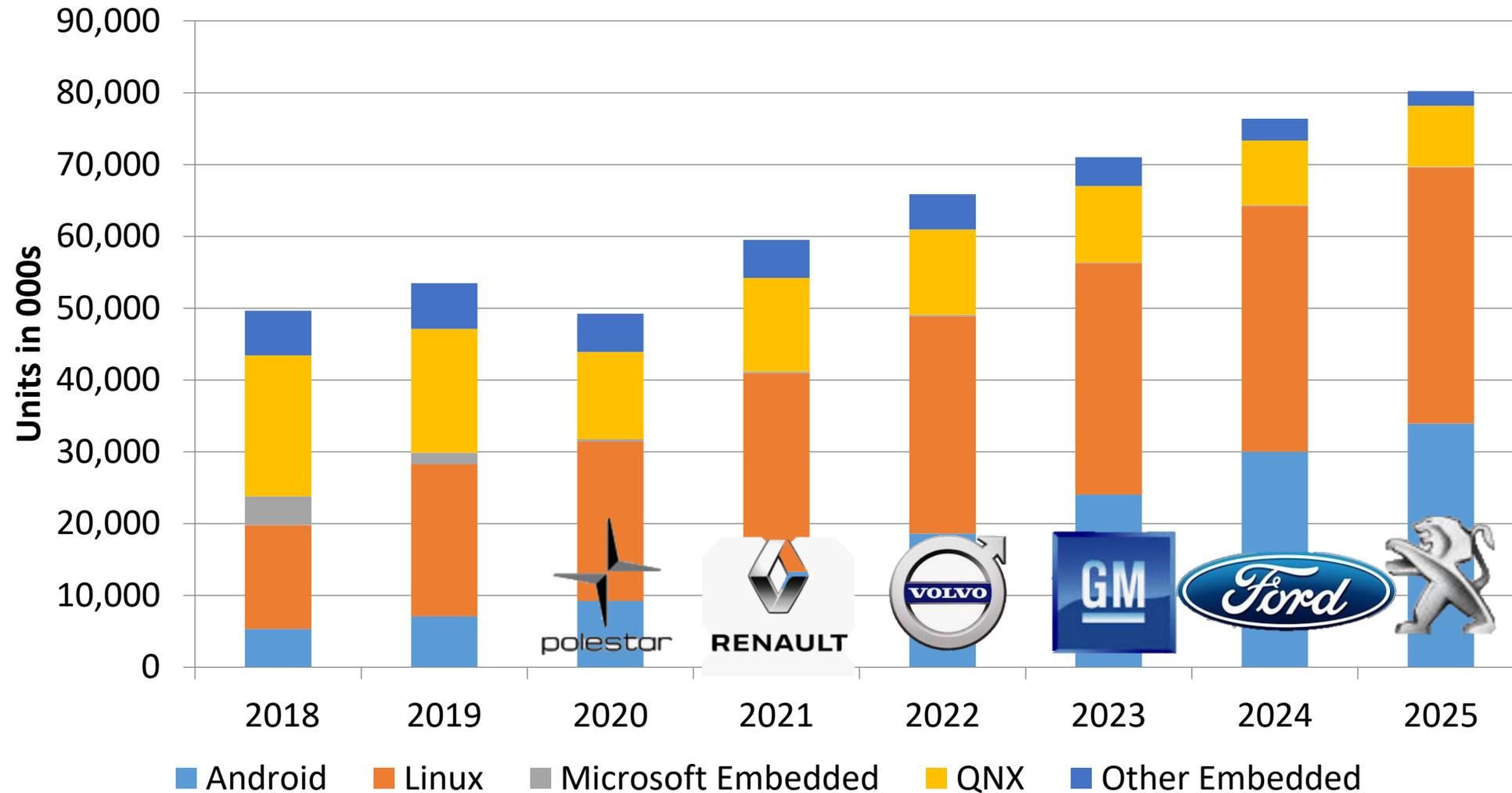
GOOGLE, ANDROID ONSLAUGHT

Understanding the impact of Google and Android adoption





THE MARCH TOWARD ANDROID ADOPTION IN CARS



Android OS: 5.5M in 2018 to 33.9M by 2025

Linux (incl. AGL and other Linux-based OSes): 14.4M in 2018 to 35.6M by 2025

Microsoft Embedded: 4M in 2018 to 108,000 by 2025.

QNX: 19.6M in 2018 to 8.4M by 2025.

Other Embedded: 6.2M by 2018 to 2M by 2025.

EXECUTIVE SUMMARY



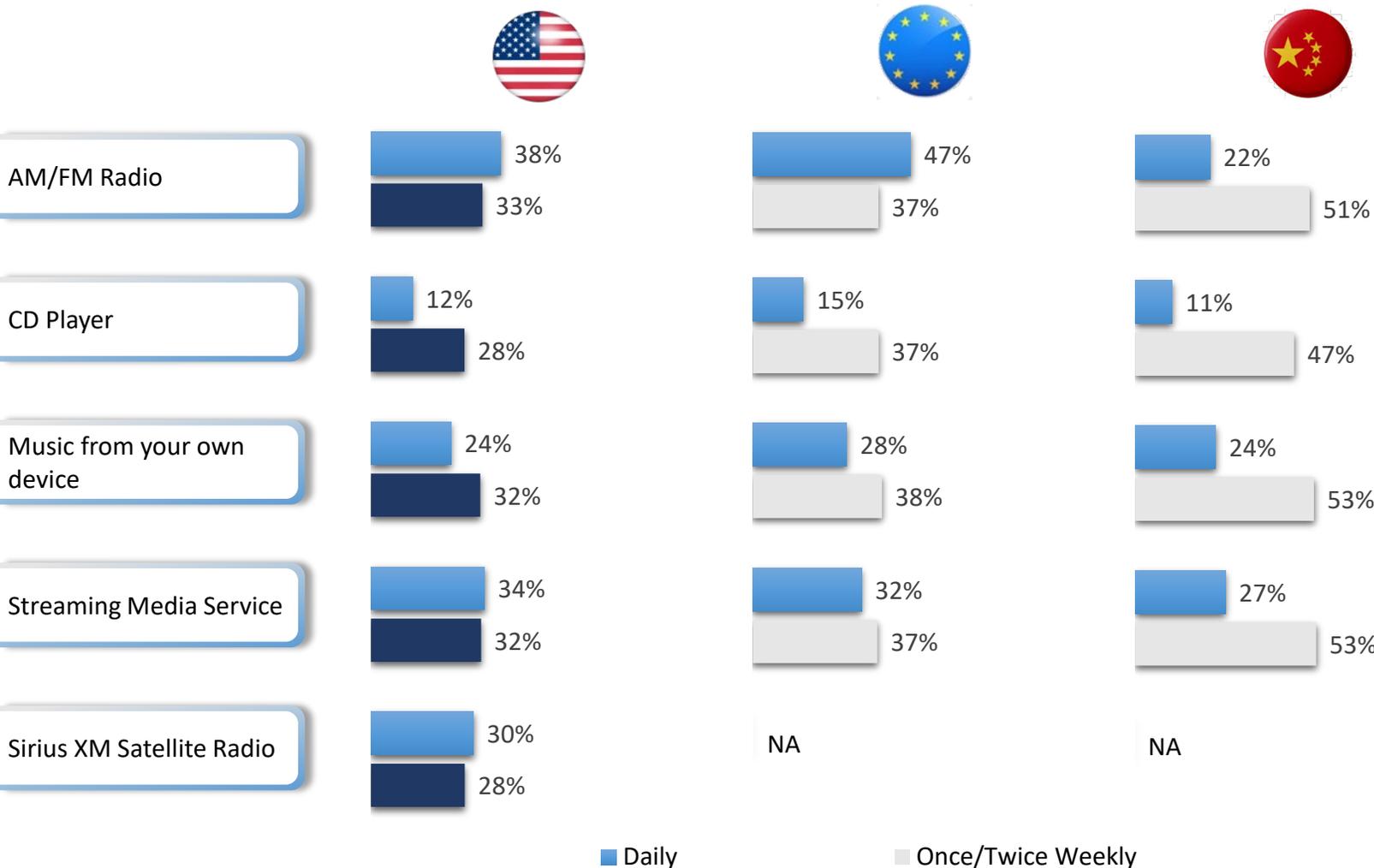
- **Strategy Analytics undertook a worldwide internet-based survey to investigate car owners' usage of, and interest in, audio infotainment sources in the car.**
 - A total of 4,705 car owners across the US, UK, France, Germany, Italy, and China were surveyed.
- **In terms of both usage and interest for in-car listening, AM/FM radio's dominance is now in danger.**
 - Streaming media has continued its steady year-over-year increase, both in terms of daily/weekly usage, and interest as a "must-have" for the next car purchase.
 - In China, streaming is now a clear #1 over AM/FM radio for usage and interest among car owners.
 - Increased adoption of streaming media has been accompanied by declines in usage and interest for AM/FM radio in all regions, including a steep decline in the US.
 - After a slight dip in 2019, interest in smartphone mirroring has rebounded in 2020.

INFOTAINMENT SOURCE USAGE



STREAMING USAGE PULLS CLEAR FROM RADIO IN CHINA, CLOSING FAST IN US

Q: How often do you use each of the following features in your vehicle?



- At least 38% of car owners in Western markets use AM/FM radio in the car daily, with a further 33% using it once/twice weekly.
 - Just 22% of car owners in China use AM/FM radio in the car daily.
- At least 27% of car owners in each market use streaming music services in the car daily.
- At least 24% of car owners in each market listen to owned music from a portable device in a car daily.

Insight: In terms of daily in-car use, streaming music services and portable owned music have overtaken AM/FM radio in China. In Western markets, AM/FM radio is still the most-used in-car source, though satellite radio and streaming music are close competitors in the US.



CONCLUSIONS

- The car has evolved to a platform – the fourth screen
- Google wants a piece of the action – but others are crowding in
- Auto makers, like digital TV makers, will need to accommodate multiple platform experiences in the car – some content-focused, others safety-centric
- The onset of 5G will facilitate this shift towards platform architecture
- Google will be both partner and competitor – enabling and supporting content

- **Digital radio technology is the tool that is leveling the field of play – new content – new user experiences – more content – audience measurement and attribution in the works**