

INTEGRATING BROADCAST AND CONNECTIVITY IN THE DIGITAL DASH

Jan Bremer, Senior Product Marketing Manager
Ron Schiffelers, Senior Director Program Management

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SECURE CONNECTIONS
FOR A SMARTER WORLD

PUBLIC

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NXP SEMICONDUCTORS WORLDWIDE

Together with our valued customers, we're not just advancing technology, we're advancing society.



AUTOMOTIVE

Enabling carmakers to develop smarter solutions for complex autonomy, connectivity, and electrification challenges

Accelerating the shift to greater mobility



INDUSTRIAL

Reducing wasted time, money, and effort by helping business run more efficiently.

Enabling more efficient data processing



MOBILE

Giving wearable and mobile devices easier access to the services that make modern life more convenient without compromising security and safety.

Transforming how people and devices connect



SMART HOME

Solutions that listen, learn, and adapt into the places we call home for more comfort, affordability, safety, and convenience.

Powering the intelligence behind the technologies



SMART CITY

Simplifying how people access and interact with local services to achieve new standards of sustainability, efficiency, mobility, and economic growth.

Anticipating the demands of tomorrow



COMMUNICATION INFRASTRUCTURE

Powering insights and inspiring performance with hardware solutions for handling 5G connectivity across the emerging communications spectrum.

Delivering real-time responsiveness at the speed of 5G

60 years of combined experience and expertise
Operations in more than **30 countries** worldwide

Approximately **29,000 employees**

Headquarters in The Netherlands – **Eindhoven**



NXP is number one in automotive infotainment systems and the global market and innovation leader for car radio solutions¹

¹Source: Strategy Analytics, May 2020

MEGA TRENDS SHAPING THE AUTOMOTIVE FUTURE



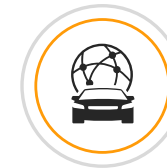
**AUTONOMOUS
ACCIDENT FREE**



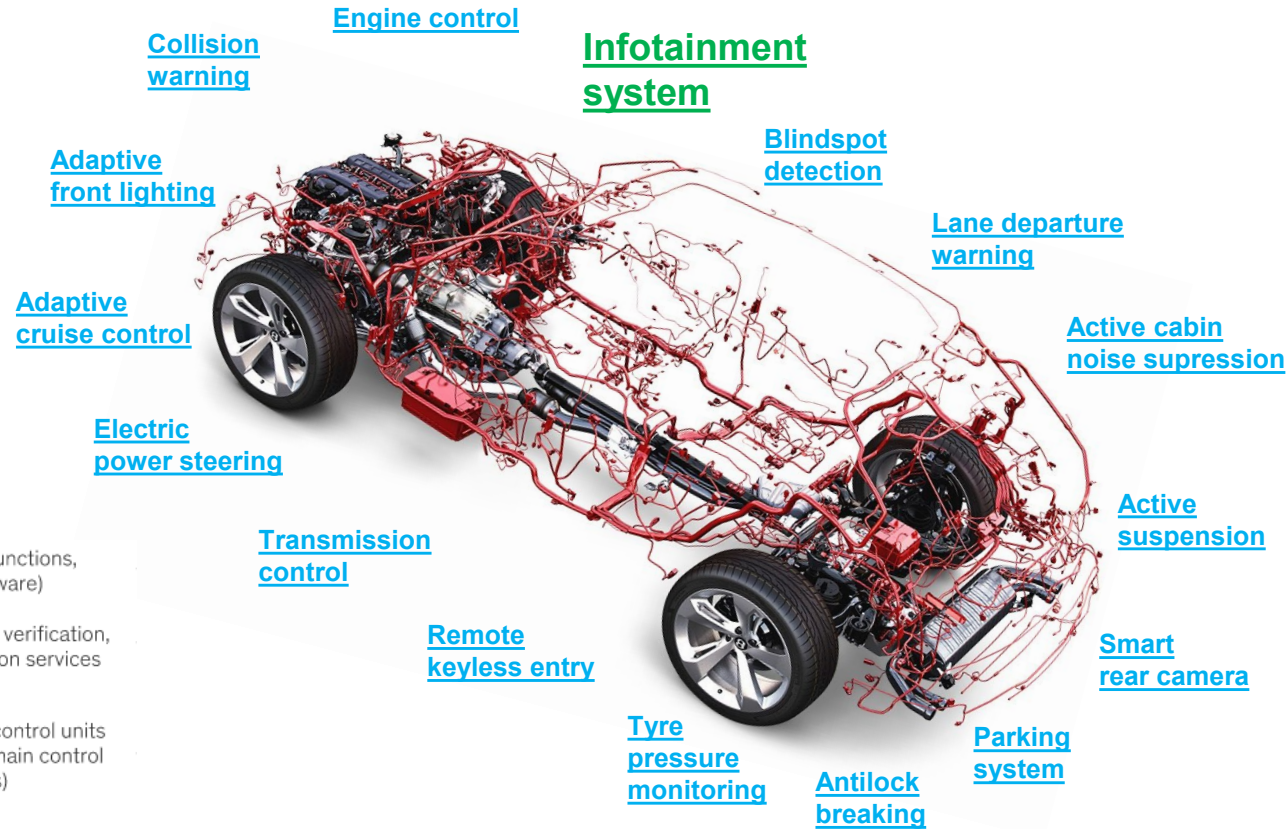
**ELECTRIC
OIL INDEPENDENT**



**CONNECTIVITY
SOFTWARE DRIVEN**

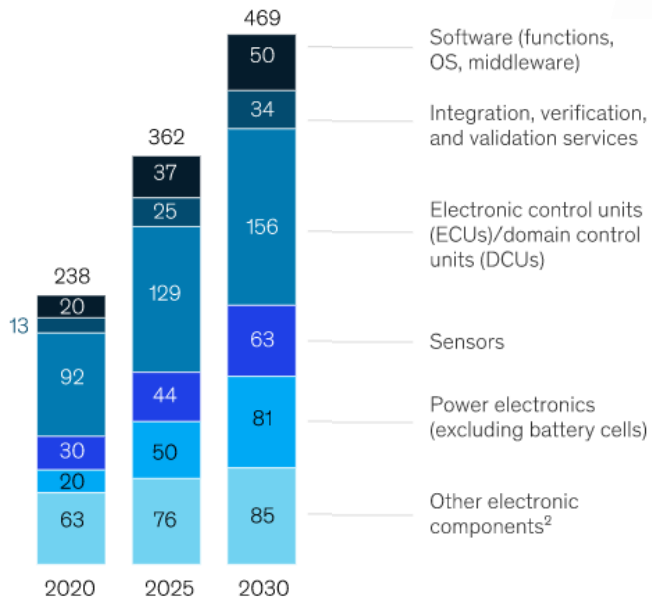


DRASTIC INCREASE OF ELECTRONIC COMPONENTS IN THE CAR COST HAS TO STAY STABLE



- In modern high-end cars, more than 150 ECUs (Electronic Control Units) are integrated
- Number of electronic components in the car steadily increases
- Mainly driven by mega trends like autonomous driving, electrification and Infotainment
- **Main challenge:** manage cost, power consumption and weight

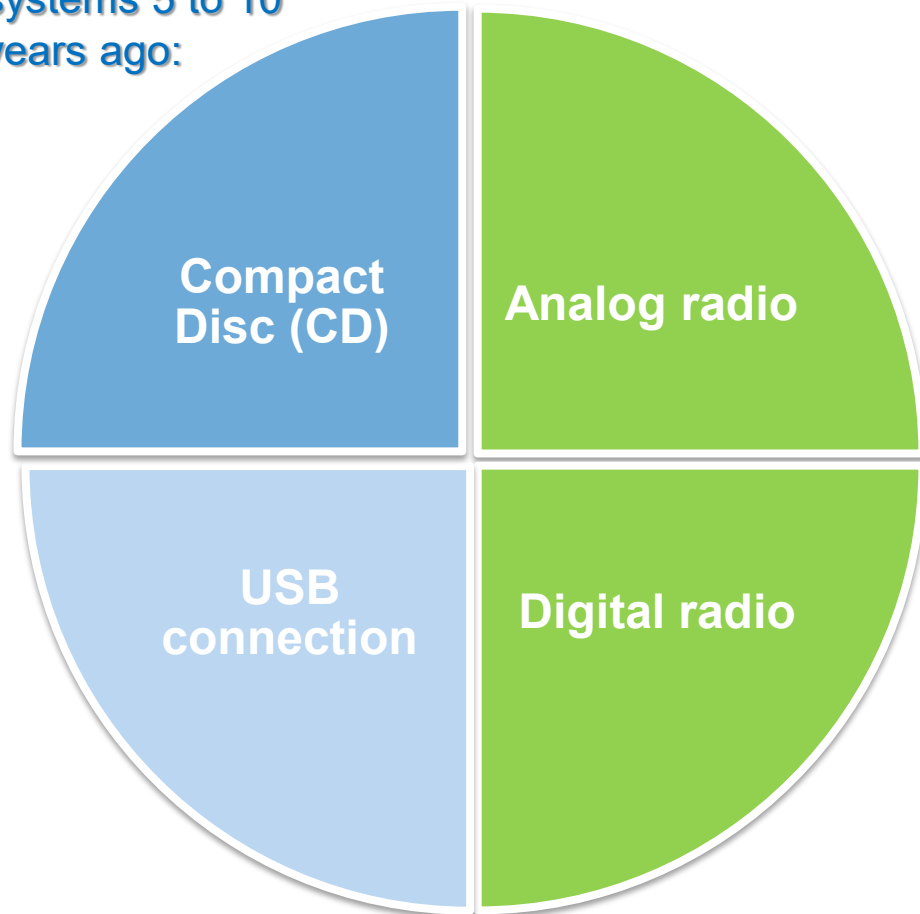
Automotive software, and E/E¹ market, 2020–30, \$ billion



Source: McKinsey&Company: Automotive software and electronics 2030

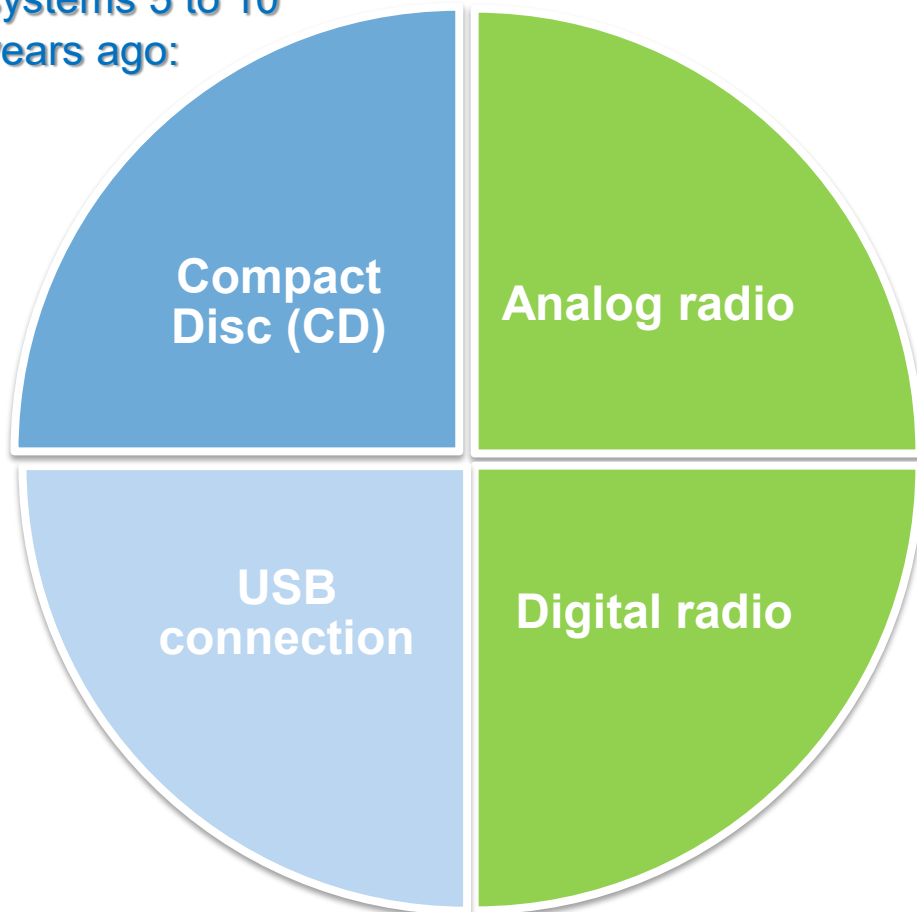
RADIO STILL A CORE FUNCTION OF MODERN INFOTAINMENT SYSTEMS BUT COMPETES WITH MORE AND MORE FEATURES

Main components
of Infotainment
systems 5 to 10
years ago:



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Trends in modern
Infotainment systems:

Seamless integration of all smart devices

Multiple and larger displays

Over the air updates

In-car voice assistant (AI enabled)

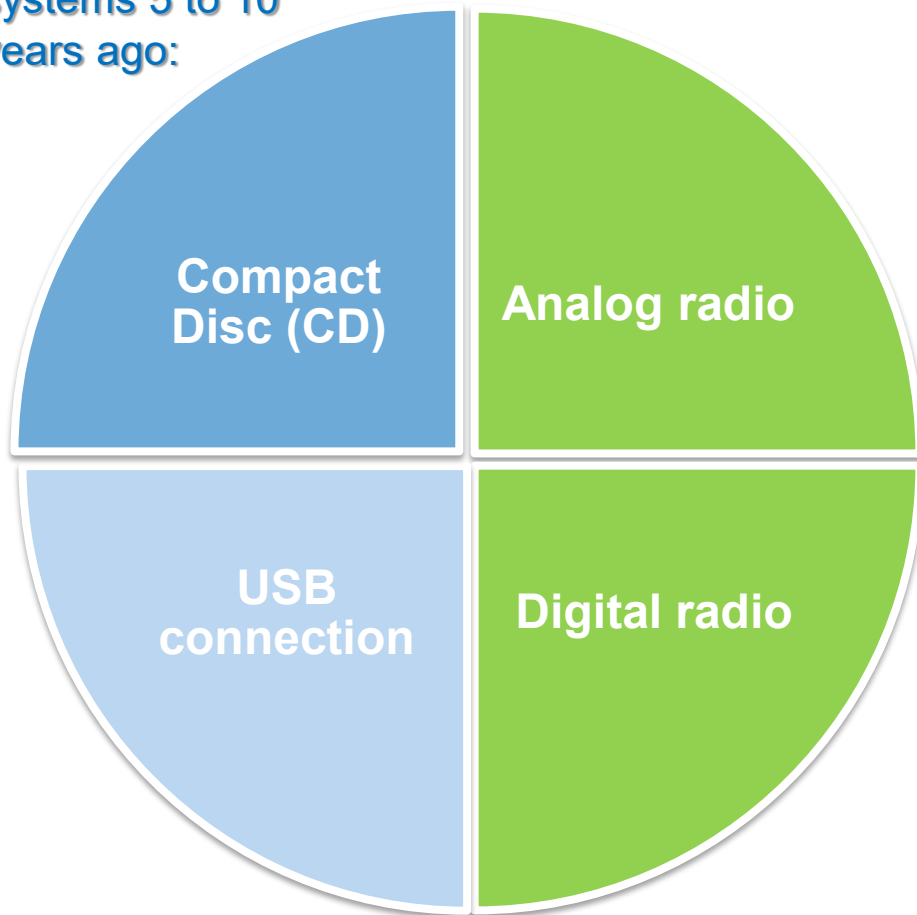
Media access (streaming, gaming, cloud, **hybrid radio**)

Advanced audio experience (e.g. sound enhancement)

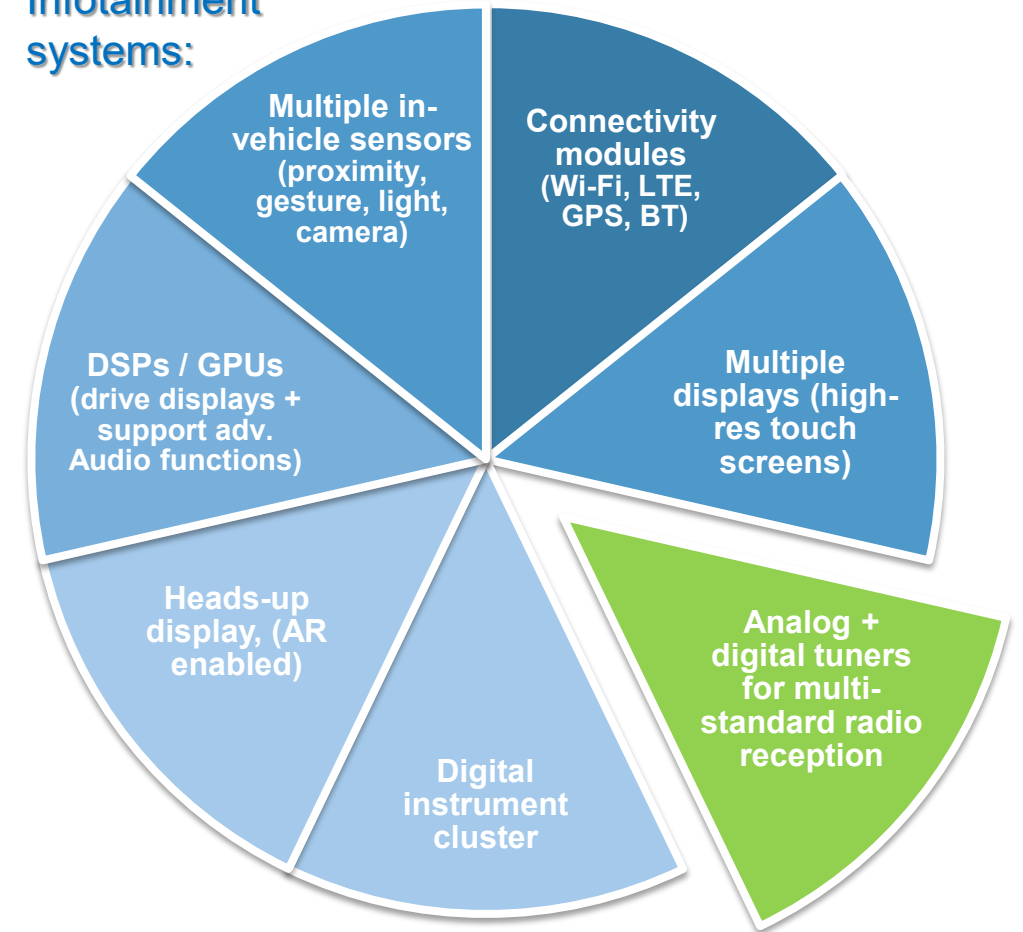
Personalization

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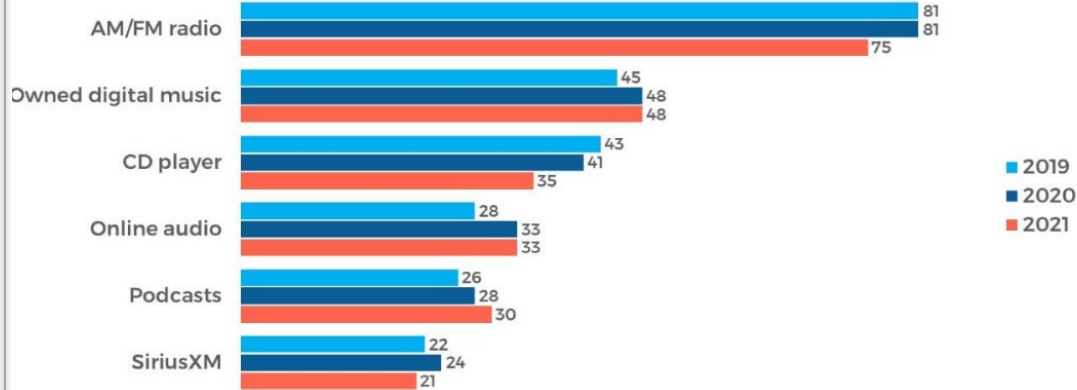
RADIO STILL MAIN AUDIO SOURCE IN CARS

Radio still main audio source in cars:

Audio Sources Currently Ever Used in Car

BASE: U.S. AGE 18+ AND HAS DRIVEN/RIDDEN IN CAR IN LAST MONTH; 83%
% USING AUDIO SOURCE IN CAR

THE INFINITE DIAL 2021



Source: The infinite dial report 2021

Radio needs to provide more than just audio to stay attractive in the future

- Unified station lists
- Seamless blending of analog, digital and IP radio
- Enhancement of radio experience with digital radio and IP services like album arts, station logos, lyrics, ...
- More attractive visual content for large screens
- Personalization of user experience
- Voice control
- Integration of extra services (podcasts, background info)
- Reliable performance even in harsh environments
- Advanced audio quality

Radio – more than music → its entertainment:

- Curated, relevant & live
- (Local) community feeling
- Easy to use → one-click entertainment

NXP'S COMMITMENT TO KEEPING RADIO ATTRACTIVE IN THE FUTURE



OPTIMIZE COSTS

Integration of more functions

- Audio DSPs
- Hybrid radio
- Control SW integration

Integration of more tuners

Global turnkey radio solutions



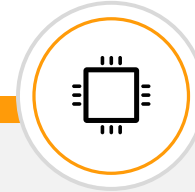
OPTIMIZE PERFORMANCE

Reception improvements

- Noise suppression for analog and digital radio bands
- Reception improvement algorithm to increase DAB reception radius

Seamless blending btw. analog, digital and IP radio

Wideband tuners (digitize complete RF signal)



ADDING FEATURES

Audio features

- Noise cancellation (e.g. road)
- In-Car Communication
- Audio Sound Enhancement

End of line programming and over-the-air updates

Enhancement with meta data from digital radio and IP

KEY TAKEAWAYS

1

Drastic increase of electronic components in the car - Cost has to stay stable

2

Radio needs to step up in user interface functionality, content and audio quality to stay attractive in the future

3

NXP commits to optimize cost, performance and integration of radio with other functions in its ICs to support future attractiveness of radio in car



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