

RENAULT NISSAN

The logo features a stylized emblem above the text, composed of two overlapping curved lines in yellow and red. Below the emblem, the words "RENAULT NISSAN" are written in a bold, black, sans-serif typeface.

GENIVI 14TH ALL-MEMBER MEETING

**MARRIOTT, PARIS 14
APRIL 27, 2016**



Agenda

Software is becoming more and more key in industry

What's wrong with In-Vehicle Infotainment systems ?

Renault/Nissan experience over the last ten years

New approach: partnerships and software architecture


Cybersecurity

Connected car benefits

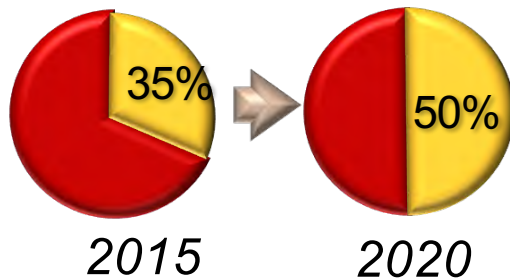
So what is expected from GENIVI?

And then ?

Software is becoming key in the industry

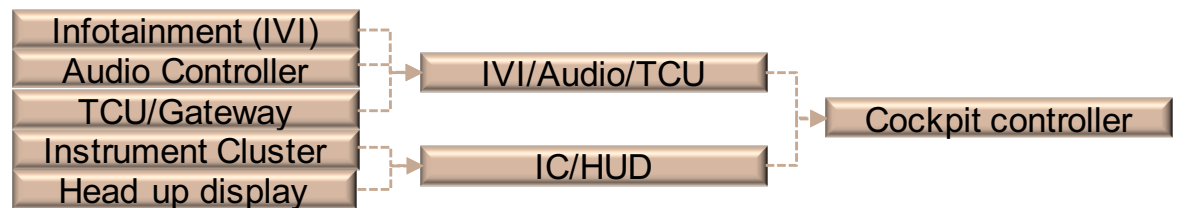
Continued growth & value of electronics in the car, with simplification of hardware:
 huge increases in software complexity

Value of digital products of a car



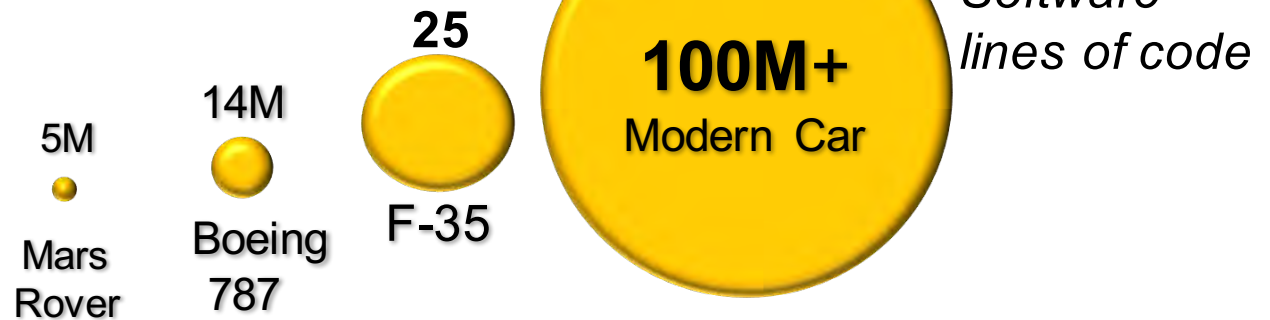
Source: Strategy& analysis

H/W simplification: Eg consolidation of ECU's



Source: Roland Berger

Increasing software complexity, compounded by multiple customer options and build configurations (limited use code)

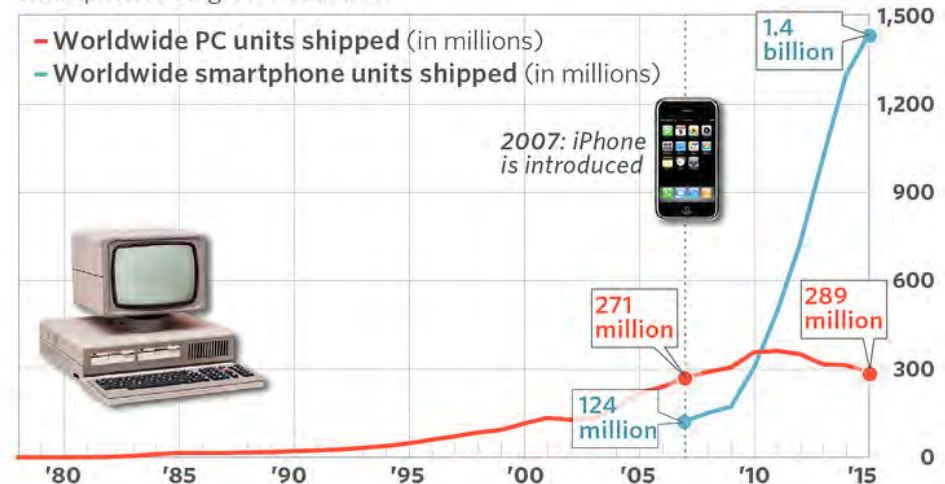


What's wrong with In-Vehicle Infotainment systems ?

✓ **Too many constraints to deal with:** **How smartphones killed the PC**

- Automotive grade applications
- Consumer Electronics features
- Size and development scheme totally different

Smartphones outgrew PCs in 2011



Source: Gartner, IDC, Apple

They are still quite bad at Start Of Production

- Unreliable schedules
- Questionable quality levels

It remains hard to bring new features with reasonable Time To Market

Renault/Nissan experience over the last ten years

Tier 1 SW Platform	Core technology	Schedule/ quality	Ease of Feature innovation
Old -	Proprietary	--	+
Brand new - LPN	Proprietary	cancelled	++
Porting of mature PND - NFA	Linux	+	-
Brand new – RLink1	Android	---	++
Portability of proven techno - ULC	WinCE	+	-
Brand new – RLink2	Android	--	++
Mature – RLink3	GENIVI	Hoping ++	Probably +
<i>Next generation</i>	<i>Hoping GENIVI</i>	<i>Hoping +++</i>	<i>Hoping +++</i>

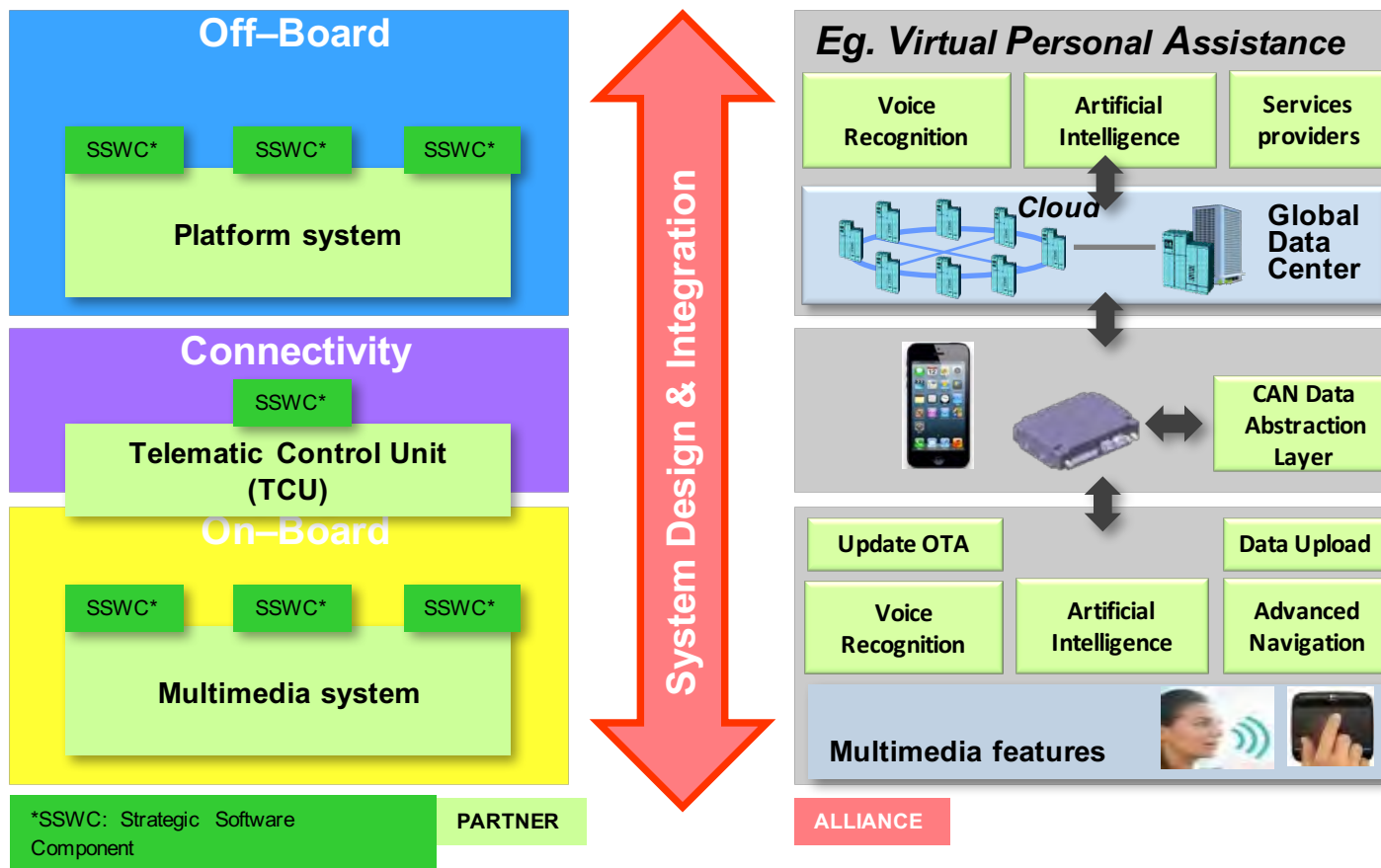
As a rule of thumb :

- New platform → trouble, but potentially nice feature sets
- Mature platform → less trouble (usually) but limited innovation

New approach:

Partnerships

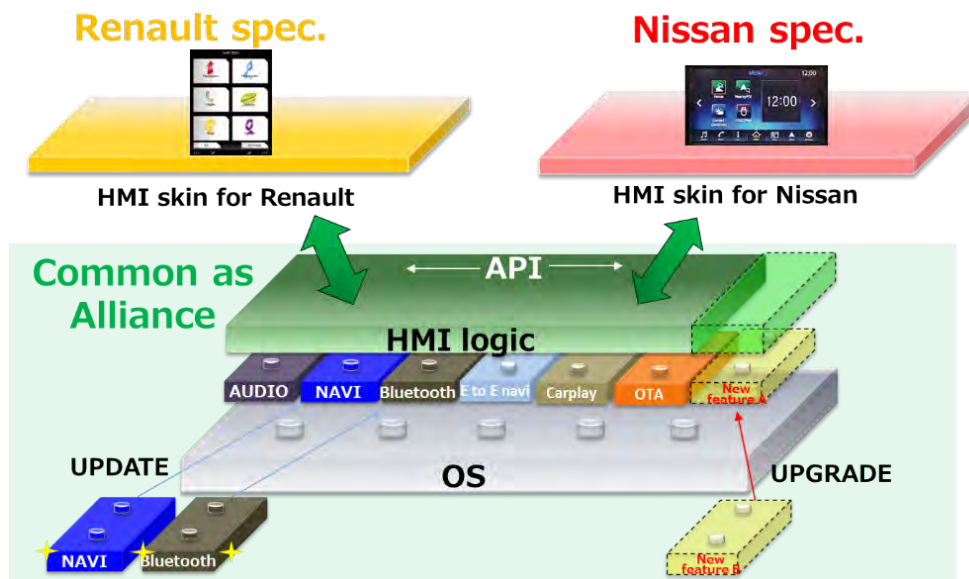
- ❑ Collaborative work : mandatory for development, with key partners in each field and Alliance as System Integrator



New approach

Software architecture

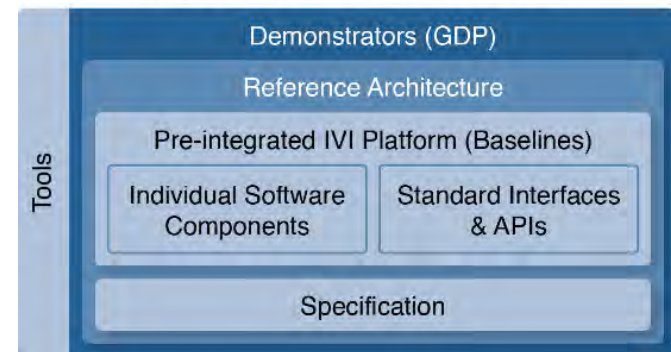
- ❑ Use of open source software, supplier based platforms & industry standard protocols to reduce time to market and cost and increase quality.



Renault Nissan Multimedia platform developed with Bosch to cover multiple brands



GENIVI Technical Deliverables



Cybersecurity

Challenges



Who's next ?

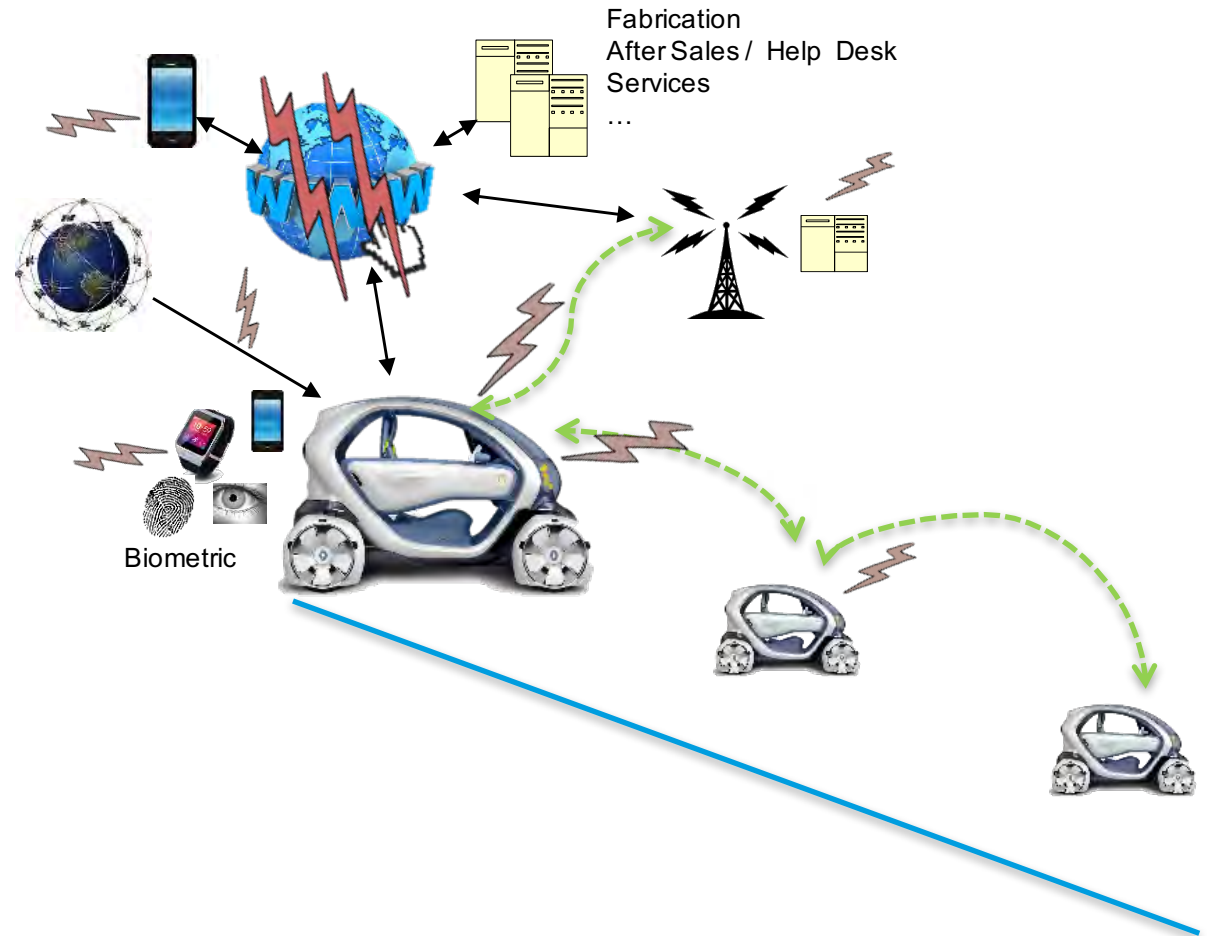
- ✓ Security measures must of course be end-to-end
 - ✓ Only area were Renault/Nissan has been intrusive in IVI SW design for quite some time: everything is in the details...
 - ✓ Security enablers and reasonable security pre-testing must be part of any shared SW platform
- ➔ ASIL B safety is the next challenge, but will likely require far better (but cost effective) HW support (hypervisors alone are not a panacea)

Cybersecurity

Action levers

More services and more wireless links: **3 levers:**

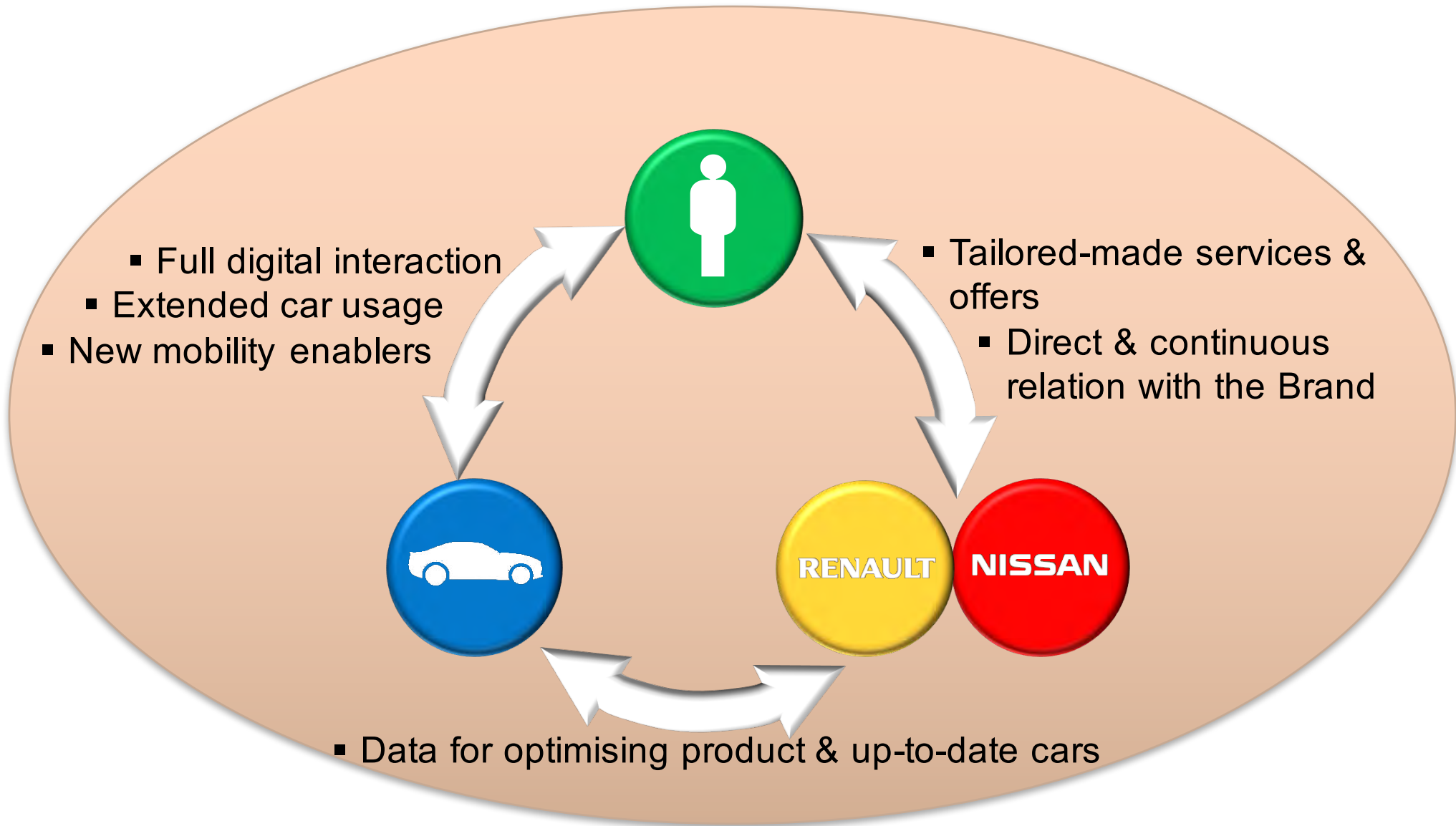
- ✓ Norms, governance, training
- ✓ Technologies and Architecture
- ✓ Management of identity, traceability and configuration / update



➔ Constant evaluation of new technologies and processes to protect our customers

Connected car benefits

A new relationship with our customers



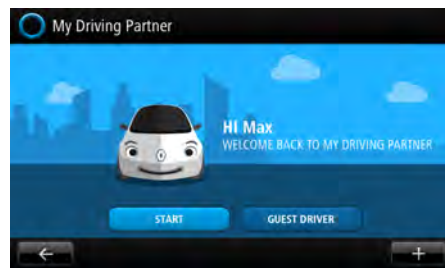
Connected car benefits

Supporting Autonomous Driving through real-time data flow
Off-board services while autonomous mode engaged

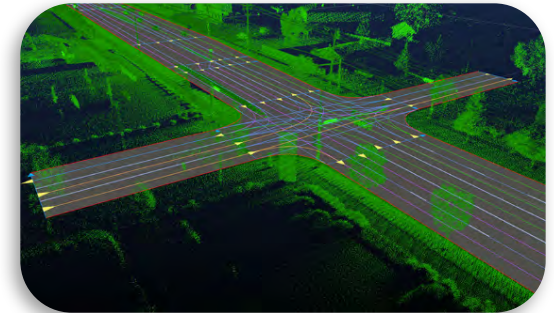


Video-conferencing, cloud based services...

Cloud based self-learning driving support



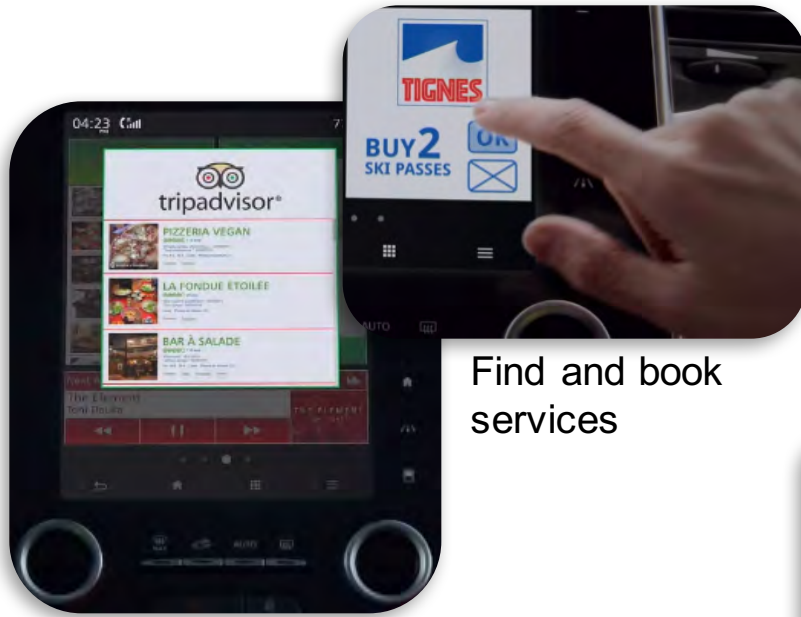
HD mapping with live updates



'Car to Car' and 'Car to Infrastructure' communication (V2X)

Connected car benefits

End to End mobility services and car access/sharing



Find and book services

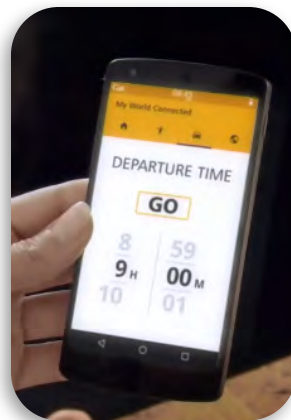


Car sharing



In-Car delivery
(Volvo+PostNord, Audi+DHL, Aftermarket 'Cardrops')

Send to car Navigation



Remote access



So what is expected from GENIVI?

Statements well known by GENIVI, Linux Foundation, and Autosar members:

- ✓ Most trouble comes from developing, porting, and tuning SW platforms (kernel + middleware);
- ✓ Both OEM and Tier1 suffer from this, wasting time and money ;
- ✓ The ultimate solution is off-the-shelf, shared, continuously evolving and tested SW platforms;
- ✓ Hardly feasible without Open Source or with market fragmentation

And then ?

- ✓ GENIVI boldly went a long way in that direction;
- ✓ Most IVI players acknowledge this, but many still behave as if they didn't;
- ✓ Google Android Auto Embedded, LF Automotive Grade Linux and even QNX try to go one or two steps further;
- ✓ GENIVI Demo Platform is a promising initiative;
- ✓ **GENIVI must (and will) still go further down this path.**

Thank you !



GENIVI[®]



CONNECTIVITY SOFTWARE ARCHITECTURE

