A Novel Approach to IVI

Based on Android



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The presenter

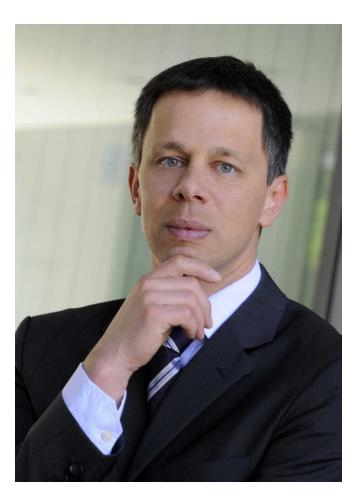


Thomas B. Rücker Open Source Evangelist

- Drives forward Linux and OSS in Tieto
- Works on community open-source (Android, ...) firmwares for tablet devices in his free time
- Background in embedded Linux and multi-media



The author



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Head of Offering Management and Go-to-market Tieto, Smart Products Engineering

- responsible for Offering Management and Goto-market coordination in the Business Unit Industrial R&D at Tieto. The unit focuses on smart products engineering services like embedded systems.
- has worked with Tieto for more than 15 years in a wide range of roles e.g. in Business Development, Offering Management, as a Head of a global product line, as well as a Senior Consultant in international projects in Europe and Asia. He has a broad experience on the Manufacturing industries.



IVI & History

2012-02-14

It all started out with



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Recent past





Proprietary systems

- Tightly designed into car look & feel
- Not extensible
- Inflexible
- After-market units
 - Constrained by DIN-slot
 - Constrained by Windshield mounting
 - No access to / integration with car systems



The future?





Current development







- GENIVI
 - MeeGo
 - Tizen
- Microsoft
- Android?



Android IVI 2012-02-14

Customer expectations

Everywhere connected

Driven by:

- Smartphones
- Tablets
- PCs
- TV



Customer expectations cont.

- Apps
- New services
- New functionality
- Support over whole life span
- Open for 3rd party content
- 'my' data and services at my fingertips



Product specifics

Life span

Cars:

- Average first ownership: 7.5 years
- Designed for 10+ years of operation

Smartphones/Tablets

- First ownership: 0.5-2a
- Designed for "till warranty runs out"



Development

Cars:

- 3 5 years development
- Models stay on the market for years
- Evolutionary process
- Might undergo slight updates

Smartphones/Tablets

- <1 year development
- Stay on the market <1 year
- Revoluationary process



Operating environment

Cars:

- -40° Celsius
- 125° Celsius
- Humidity

Smartphones/Tablets would experience

- Cracked screens
- Broken electronics
- Refused warranty



CAN bus

- Controller Area Network
- Several buses in one vehicle
- "ideal" firewalls



Limitations

Legal et al.

Legal liability

- Security has the highest priority
- The OEM (car manufacturer) is on the hook
- Whole car, includes IVI system
- Hardware & Software



Stationary vs. Moving

While stationary

e.g. Video/TV playback only while stationary

While driving

• HMI (Human Machine Interface) interaction must not distract

Always:

Uninterrrupted operation of all critical systems



Opportunities

Leverage the Android "Ecosystem"

- Leverage the Android "Ecosystem"
- Many experienced developers
- Well documented
- 400k existing apps
- Mature architecture
 - Multimedia
 - Connectivity



Open platform

- Possibly multiple players in the Android IVI field
- Synergy effects between players
- Benefit from other device form factors



Familiar to the user

- Intuitive UI
- Known concepts, philosophy
- Possibly the same applications as on other devices



What's in it for OEM and suppliers

- OEMs don't care much about price advantage
- OEMs won't go for it without a business case
- Tier 1 suppliers
 - Faster delivery
 - Reduced engineering effort



Challenges

The apps story

- Unless IVI becomes 'GoogleCar', no Android app market
- OEM specific or shared market with branding
- Certification process for apps
 - Drive
 - CAN bus access
 - •
- Standardize IVI specific interface access
- 'one' app for different targets (phone, tablet, TV, car)



The apps story – contd.

- A common IVI apps market
- OEM branding
- Common certification
- Possible business models



HMI – Human Machine Interface

- Will require non-disturbing input methods
 - Voice control
 - Gestures
 - •
- Easy to read UI for apps that are used while driving
- Notifications, HUD



HMI – contd.

- Ongoing research
- Still no widely accepted concept
- Our research showed promising direction in 'gesture' based interfaces
- Gesture surface not necessarily the screen



Engineering requirements

What know-how do you need

- Technologies
- Automotive product creation process
- System Integration
- Verification, validation
- Standards and legal requirements
- OEMs, their brand and product strategies
- References
 - Demonstrators
 - Automotive project experience



How do you see Android & IVI?

Let us know, we're open for discussion.

Questions?



Knowledge. Passion. Results.

