

# 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



Peter Seidenschwang

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

- responsible for Offering Management and Go-to-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

# 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



**Microsoft®**



ANDROID

- GENIVI
  - MeeGo
  - Tizen
- Microsoft
- Android?





# 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
- Revoluationalary 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:

- Uninterrupted 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.**