automotiveHMI
Model-Based HMI-Development in the Automotive Industry

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Public funded research project with the objective to optimize HMI-development processes in the German automotive industry

Basic facts & figures

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Duration
36 months (January 2011 – December 2013)

Structure
9 partners: 2 research and 7 industrial partners
4 associated partners (so far)

Volume
About 7,5 Mio. Euro

Funded by
Federal Ministry of Economics and Technology (BMWi)
A consortium that covers the complete supply chain of automotive HMI-development

**Partners**

Car manufacturers

- Audi
- Daimler
- Volkswagen
- Porsche

Research Facilities

- Deutsches Forschungszentrum für Künstliche Intelligenz GmbH
- Fraunhofer Institute (IESE)

Tier-1 Suppliers

- Bosch
- Continental
- Harman

Tool-Developer, System Integrator and Association

- comlet
- VDA: Verband der Automobilindustrie

Associated Partners
Collaborative approach to overcome paper-based HMI-specifications by establishing a formal interchange format as an industry standard

The project automotiveHMI

The time-to-market for human-machine-interfaces (HMI) in the German automotive industry has to be reduced. The increasing complexity of new HMI-systems due to the integration of new infotainment and driver assistance systems as well as the continuous shortening of innovation cycles in the consumer electronics industry increases the pressure on German car manufacturers and their suppliers. In the future, more complex HMI-systems have to be brought faster and less cost-intensive to the market.

However, today’s HMI development processes are characterized by different, inconsistent work flows and heterogeneous tool chains. The exchange of paper-based specification documents between the process participants causes media discontinuity, inhibits version management, reduces the reusability and hampers the communication.

In the project automotiveHMI the partners pursue the objective of developing a domain specific, model-based exchange format allowing the formal and uniform specification of HMI development artifacts. The exchange format shall work as a machine-readable data interface between the different roles and actors involved in automotive HMI development. Thus it becomes possible to overcome the digital divide resulting from today’s paper-based and heterogeneous work flows.
Model-based exchange format, model-based HMI-testing and a new middleware approach as the three central project pillars

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<thead>
<tr>
<th>Model-based HMI-testing</th>
<th>Model-based exchange format</th>
<th>Middleware</th>
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<tr>
<td>- Automatic derivation of HMI-tests from the machine readable HMI-specification documents</td>
<td>- Formal specification of HMI-systems</td>
<td>- Abstraction of concrete hardware platforms</td>
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<td>- Reduction of test efforts by limiting the number of relevant HMI tests per variant and market</td>
<td>- Different tools but one common exchange format</td>
<td>- Standardization of the communication between HMI and application layer of the car</td>
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<tr>
<td>- Complete and efficient HMI tests despite increasing system complexity</td>
<td>- Domain specific</td>
<td>- Reduction of development costs and efforts by increasing reusability of components</td>
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<td>- Open XML-based implementation</td>
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<td>- Linking of requirements and development artifacts</td>
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<td>- Better traceability</td>
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<td>- Iterative refinement: from informal mockups to formal screen specifications</td>
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