



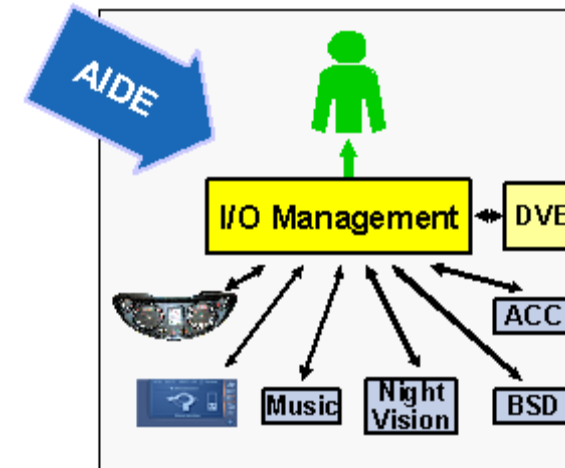
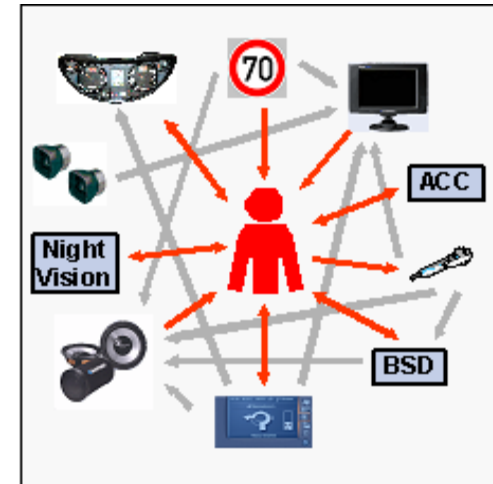
AIDE Software Architecture

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Basic Idea



- Today: IVIS (in-vehicle information systems) and ADAS (adaptive driver assistance systems) individually interact with the driver
- AIDE: Communication between driver and in-vehicle systems is managed by a central I/O Management based on the Driver-Vehicle-Environment



General Architecture Requirements



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- The vehicle manufacturers have full control on HMI strategies, e.g. the specific form, location and timing of output messages. Thus, the strategies should be independent of the supplied components.
- The architecture must be flexible with respect to the constellation of individual applications including both IVIS and ADAS.
- The general HMI management solution should be largely independent of the underlying electronics hardware/software platform and communication bus technologies
- Nomadic devices should be seamless integrated



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HMI-Management „meta-functions“



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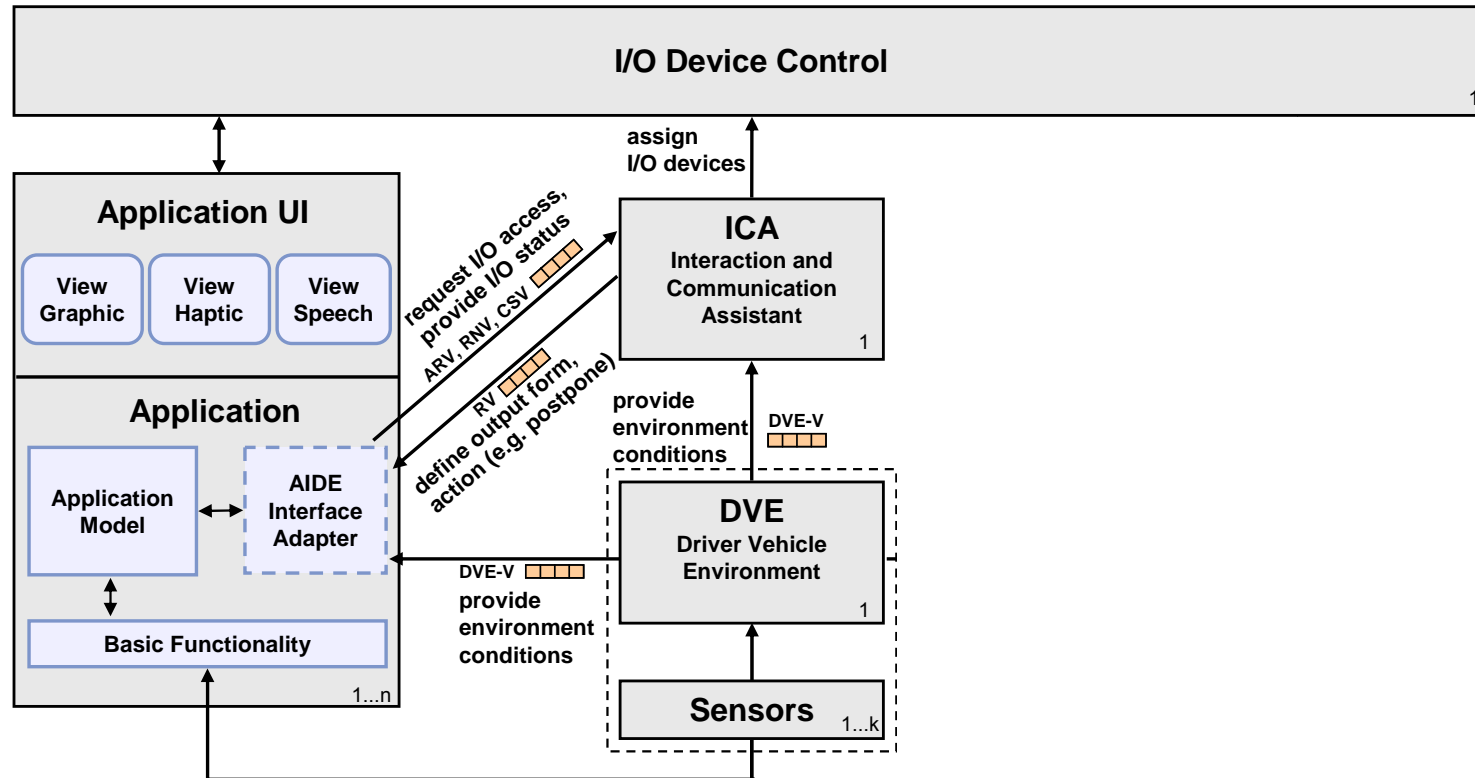
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- I/O action coordination based on priorities, e.g. termination, postpone, interruption of output messages, according to DVE data or due to other running system output.
- Change of output format according to DVE data and/or due to other running system output
- Change output channel according to DVE data and/or due to other running system output



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Functional Reference Architecture



- ARV:** Each application has to request the access to I/O devices by an **Application Request Vector** sent to the ICA.
- RV:** The **Reply Vector** defines the form to be chosen for output and the action e.g. postpone, terminate.
- RNV:** The **Request No more Valid Vector** informs the ICA in the case that a requested action is no more valid.
- CSV:** The **Channel Status Vector** informs the ICA about the device status.
- DVE vector:** The **Driver Vehicle Environment Vector** informs the ICA and Application on detected DVE conditions.

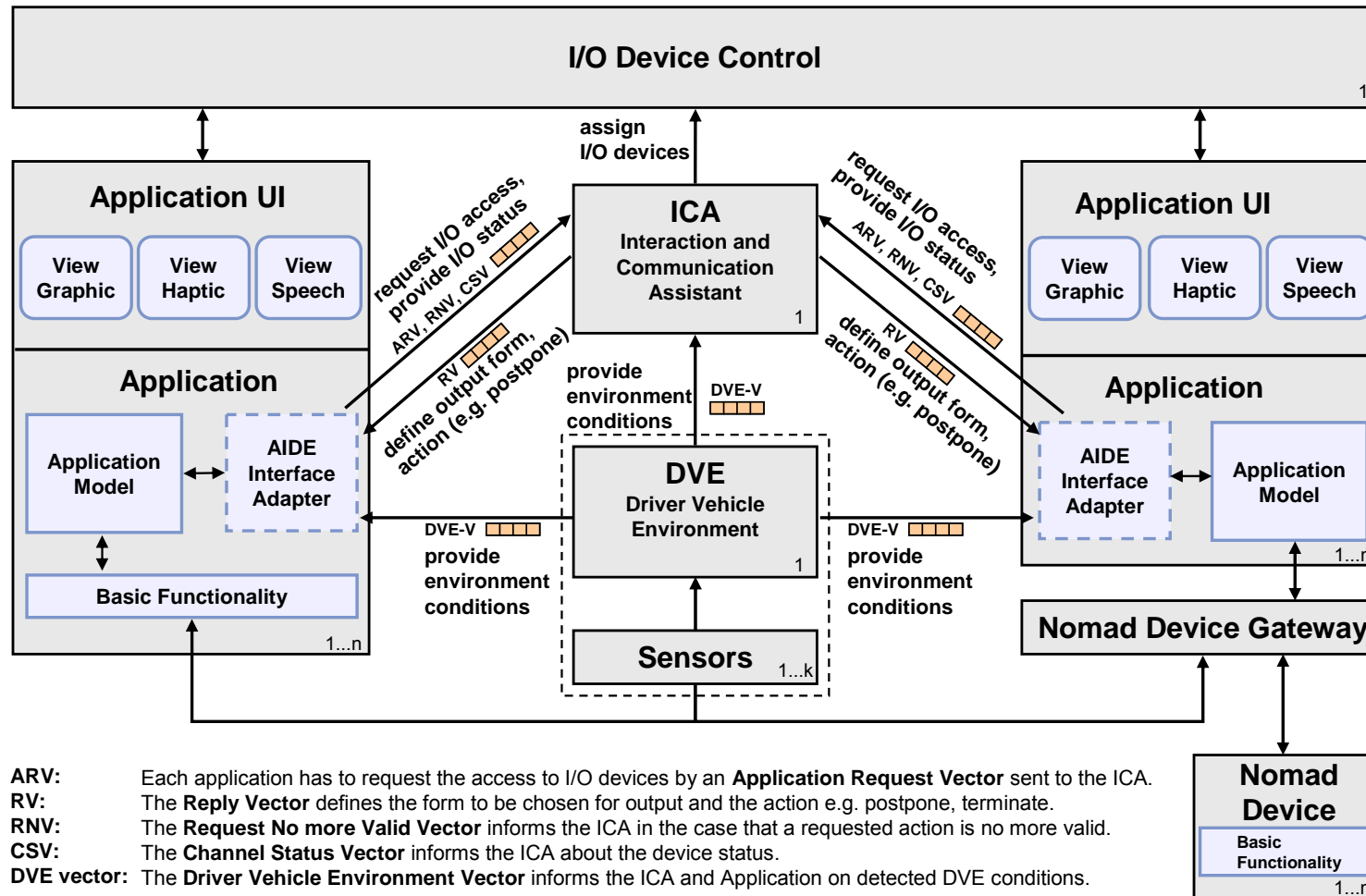


Functional Reference Architecture



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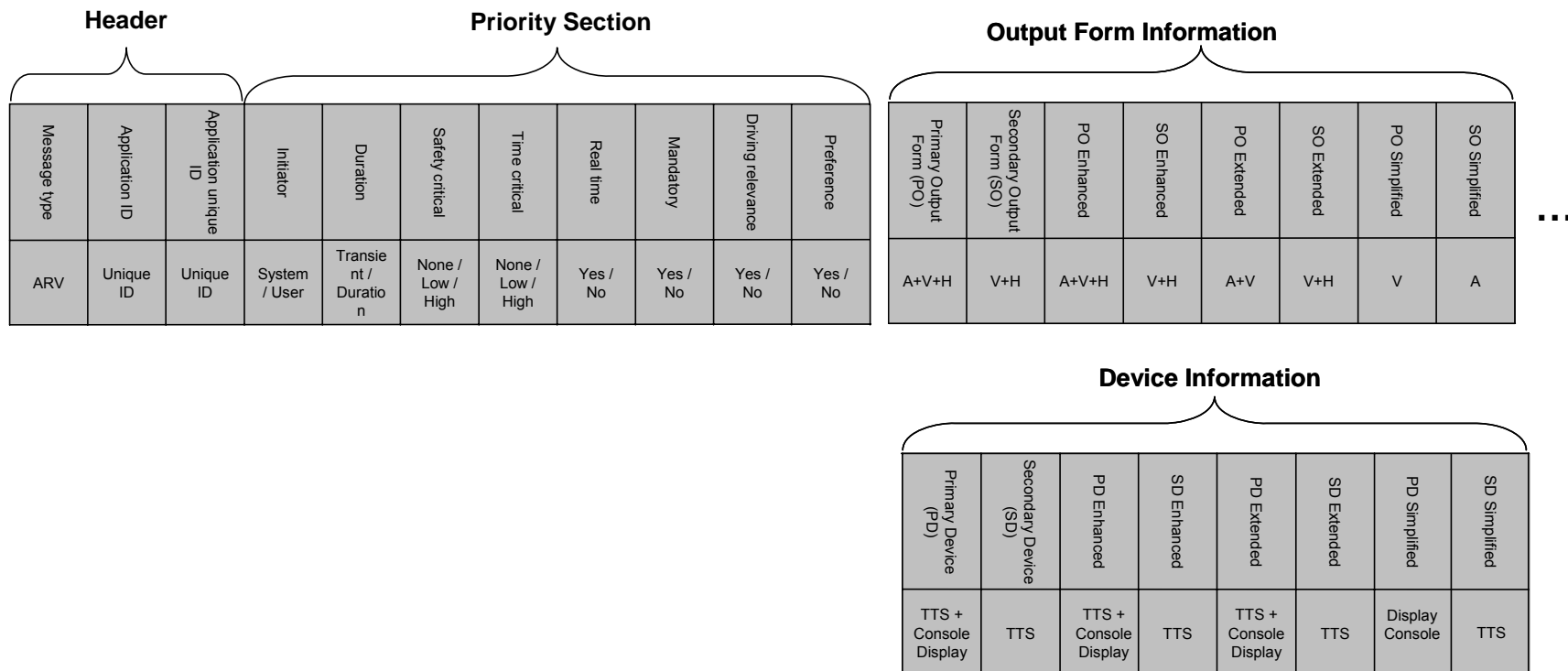


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ICA Communication Vectors



- Example: Application Request Vector



ICA Communication Vectors



- Example: Application Request Vector

Priority Section

Initiator	Duration	Safety critical	Time critical	Real time	Mandatory	Driving relevance	Preference
System / User	Transient / Duration	None / Low / High	None / Low / High	Yes / No	Yes / No	Yes / No	Yes / No

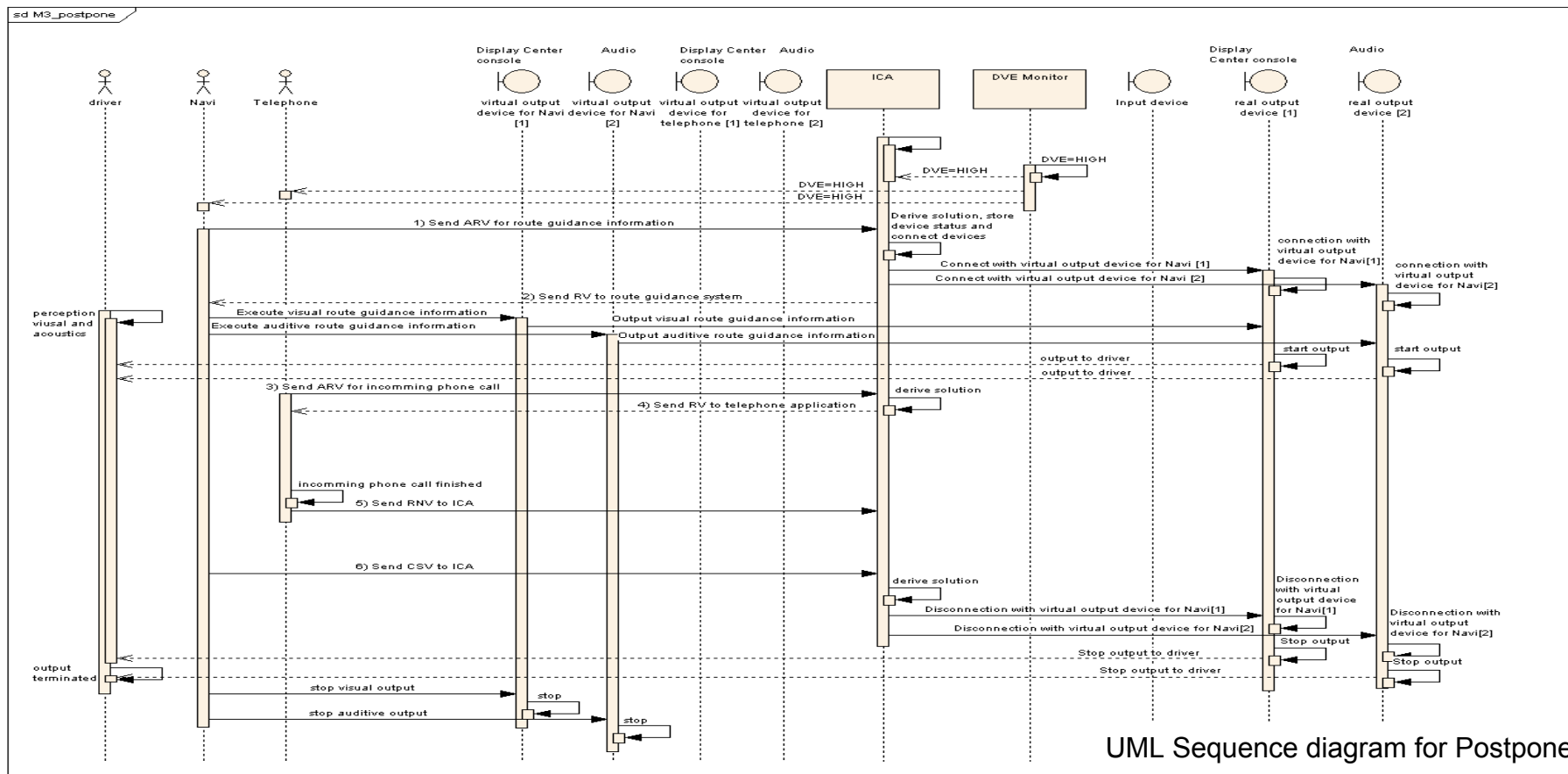
Characteristics of the requested output is described not a priority level !



Sequence diagrams



- All meta-functions are described by sequence diagrams



UML Sequence diagram for Postpone



Conclusions



TOWARDS FUTURE AUTOMOTIVE HMI

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- AIDE Functional Reference Architecture defined, which is
 - flexible with respect to the constellation of individual applications
 - independent of the underlying electronics vehicle
 - manufacturers have full control on HMI
- Detailed description of components, communication principles, meta functions and related sequence diagrams available
- Verification of architecture by reference implementation within demo-cars



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