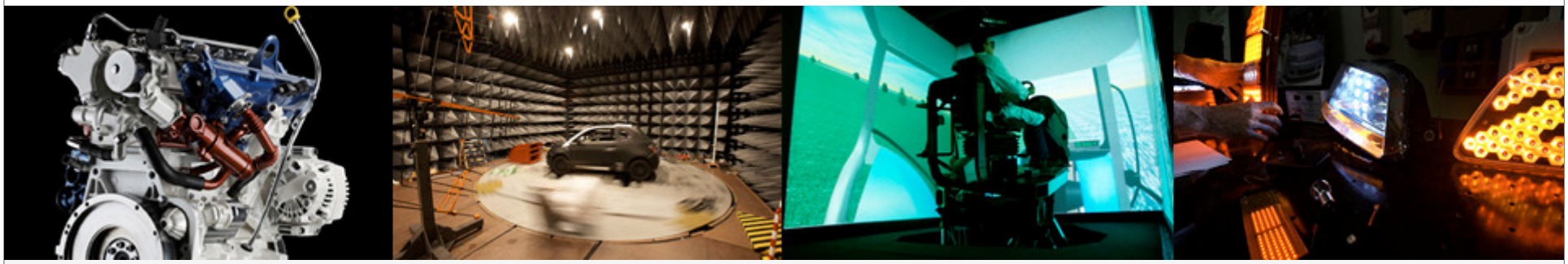
FIAT GROUP

CRF CENTRO RICERCHE FIAT



AIDE – considerations

SeVeCom – AIDE

Cosenza Stefano

AIDE IP: Objectives of the adaptive interface design and development

- **Safe use** of all input / output on board and nomad devices;
- **No interference** and negative impact of multiple information sources;
- **No demanding** and not-understandable interactions for the driver;
- To keep **driver's workload** at a level that does not affect a **safe driving** performance;
- To reduce the **interaction complexity** via **reconfigurability** (according to driving task and context);
- To create a **natural communication flow** " like a dialogue" of the vehicle and the driver;

- **Design and development of an integrated multichannel user interface** including nomad devices intuitive for the driver, easy to use and of immediate perception and interpretation of any potential risk!!!!

- **Design and development of an administrator of the information flow:**
  - **"Interaction Communication Assistant" that defines in real time:**
    - **which information to deliver, when and how**
    - **which activity can be allowed to the driver on the secondary task**

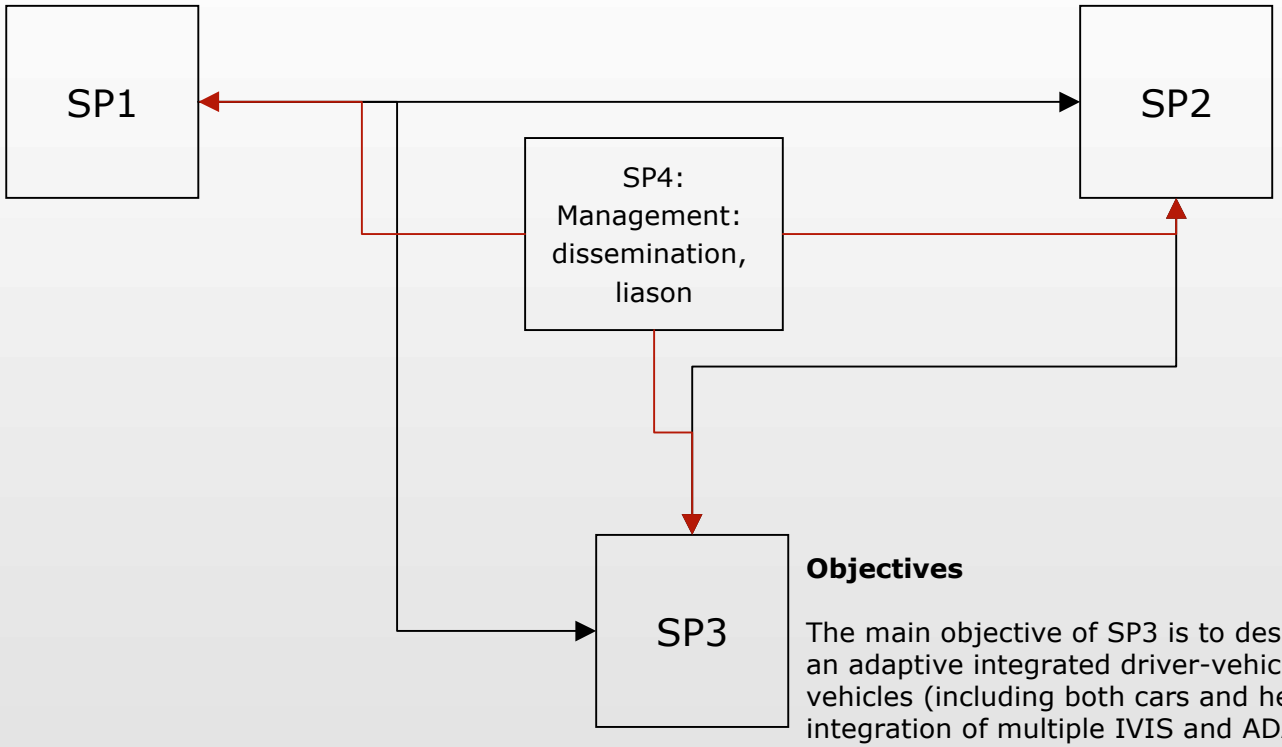
AIDE – SPs: Correlation

Objectives

SP1 will identify and model the behavioural effects of IVIS and ADAS functions.

Objectives

the objective of SP2 is to develop a cost efficient and industrially applicable methodology for quantifying these effects and their relation to road safety. An important goal is to extend existing approaches in order to account for new adaptive integrated interface solutions, new ADAS and nomad devices.



Objectives

The main objective of SP3 is to design, develop and validate an adaptive integrated driver-vehicle interface for road vehicles (including both cars and heavy trucks) for the safe integration of multiple IVIS and ADAS functions, including nomad devices.

AIDE – SPs: Expected results

SP1

Expected results

- Results on behavioural effects of IVIS and ADAS.
- Model of the driver-vehicle-environment interaction.
- Simulation of the driver-vehicle-environment interaction (DVE).

SP2

Expected results

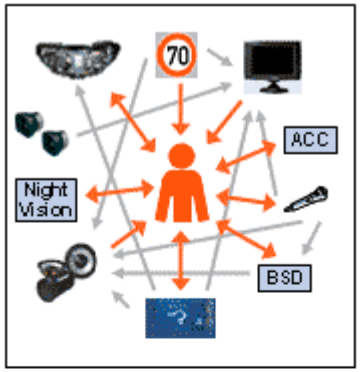
- A generic methodology for industrial HMI evaluation with respect to road safety.
- Validate AIDE prototypes.

SP3

Expected results

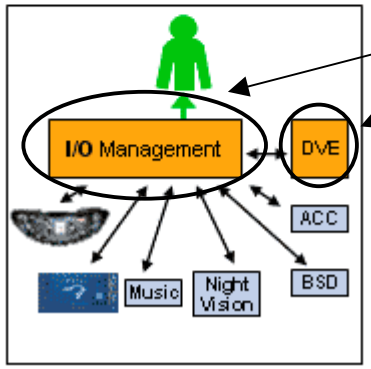
- Technically verified AIDE prototypes (city car, luxury car and heavy truck)

AIDE – SPs: Expected results



Today

AIDE



Vision

At the moment…

AIDE objectives in synthesis…

AIDE – ICA

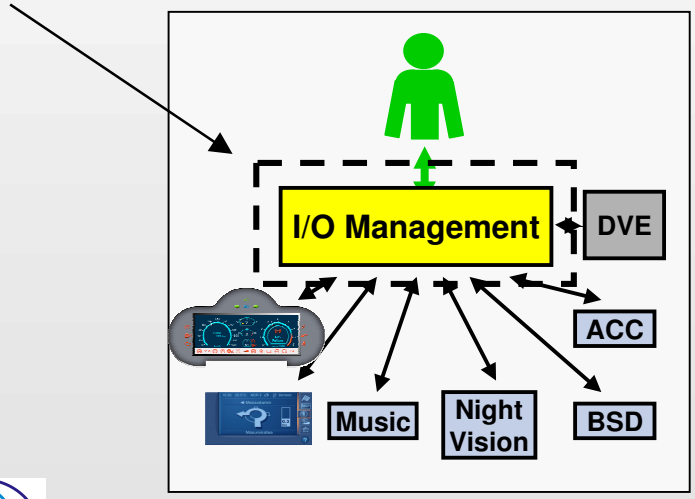
ICA is the **central intelligence** of the AIDE system

ICA is the core of the driver-vehicle dialogue as it defines the **communication and data exchange protocol**

ICA is responsible for managing all the interaction and communication between the driver, the vehicle and the driver's personal nomadic devices

Starting from the Driver-Vehicle-Environment (DVE) conditions, the ICA selects:

- the information prioritisation and scheduling
- the information format and display modality
- the output channel



The Interaction and Communication Assistant (ICA) ensures that information is given to the driver:

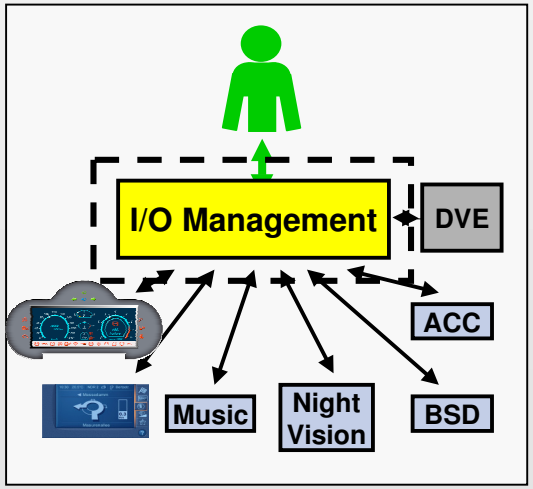
<u>at the right time</u>

<u>in the right way</u>

and that only <u>relevant functions</u> respect the present driving <u>are active</u>.

AIDE – ICA

- An “application request vector” is sent by an application to the ICA each time an information has to be dispatched
- ICA’s **priority manager** assigns priorities on the basis of the parameters that describe the actions.
- ICA’s **filter** decides if an information can be given immediately or not according to the DVE conditions.
- ICA’s **modality selector** applies the adaptation strategy to decide if the information has to be displayed with its standard modality or if it has to be highlighted or lengthen according to the DVE conditions
- ICA’s **channel selector** checks if the candidate channel (display, loudspeaker, etc.) is free, if not:
  - if a secondary channel is planned by the strategies, the information is redirected
  - if a secondary channel is not planned, the information is queued.

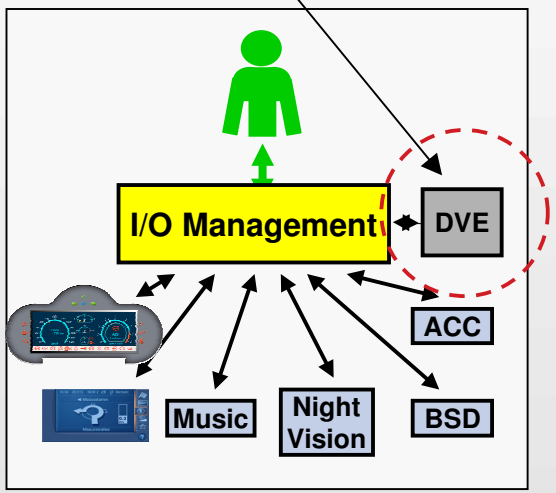


AIDE – DVE

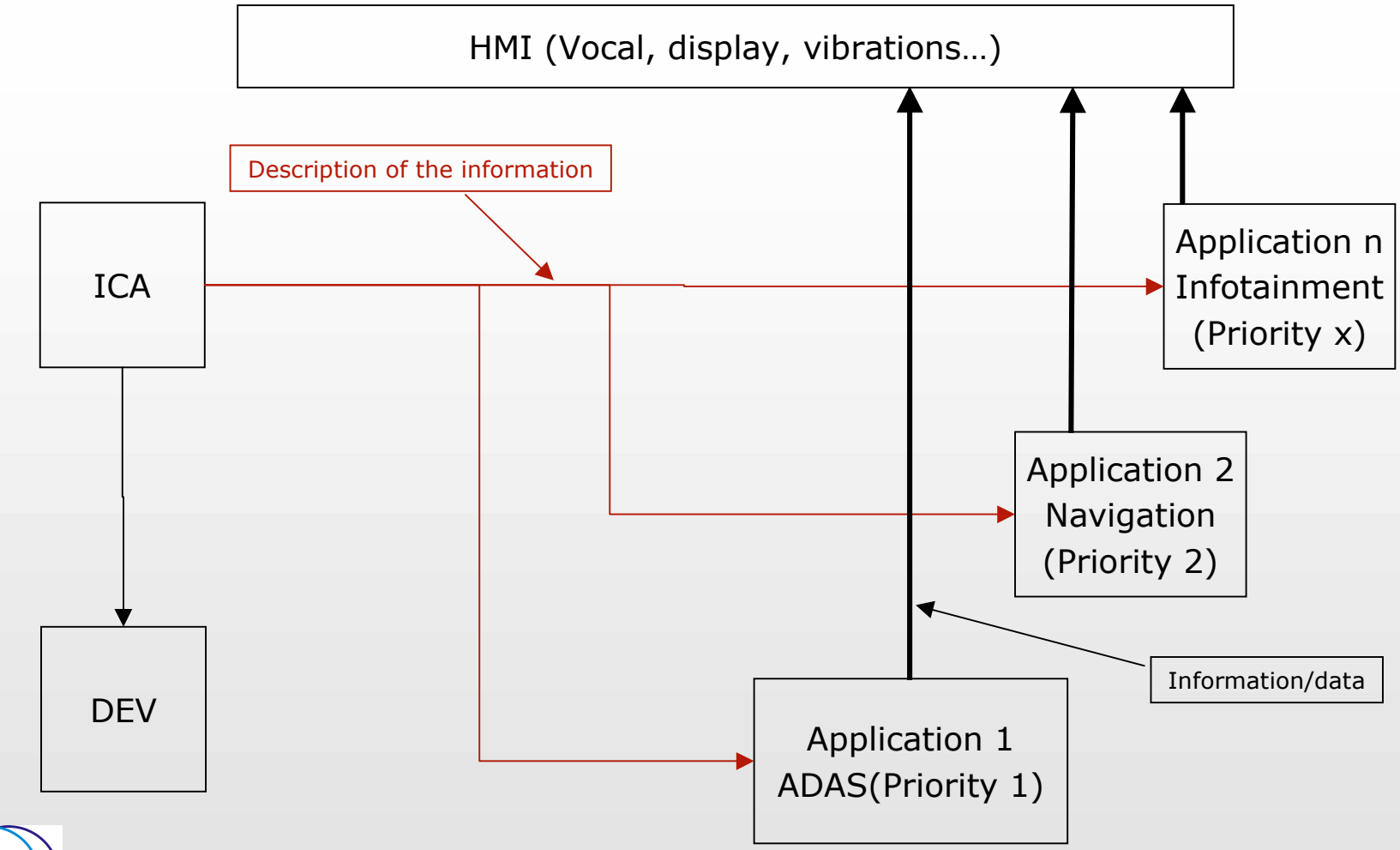
DVE

A driver vehicle environment component called DVE monitoring the driver and the driving situation to derive condition information about the driver, the vehicle and the environment which is used by ICA and applications to adapt the output messages.

Evaluation of the workload respect to the driving task



AIDE –flows of information



AIDE – Security → Where?

Point to discuss:

AIDE consider all data and info as trusted and verified?

The security is out of the scope of AIDE?

Security should be taken into account at the application level?

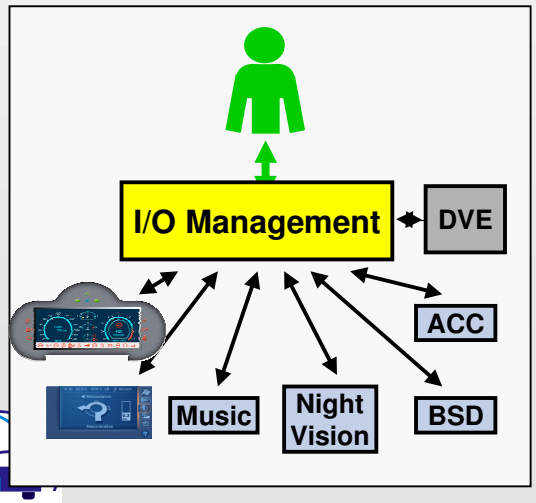
AIDE and Privacy?

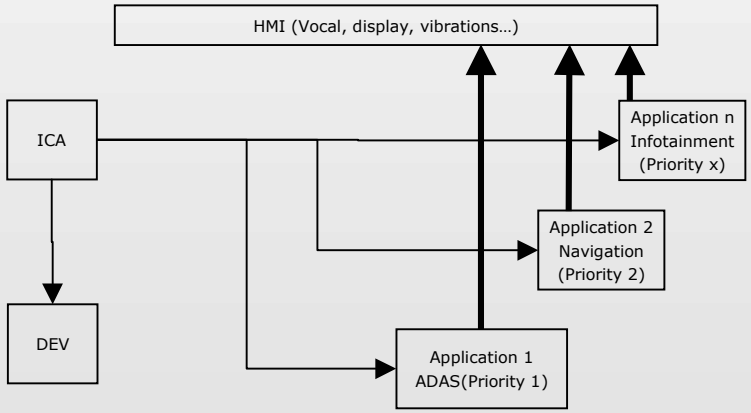
The applications do not communicate on the same buffer

A possible attack can try do disactivate ICA functionalities → DoS (?)

In AIDE the cooperative systems were not considered → no info to other vehicles

Privacy should be taken into account at application level





AIDE – FINAL WORKSHOP

April 2008:

Agenda: Not defined yet!!!!!

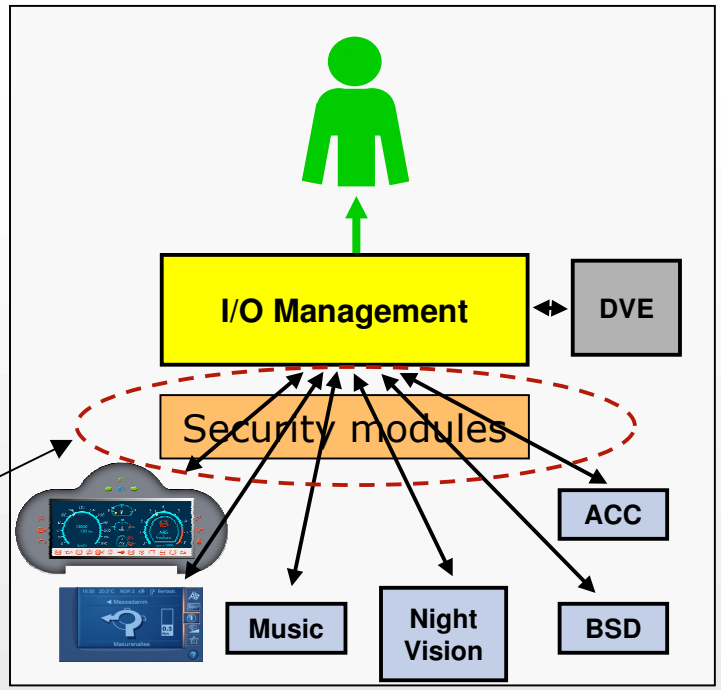
Topics:

SP1 → Results

SP2 → Results

SP3 → Results

Security → Proposal(???)



3 demonstrators will be presented→

Luxury car;
Truck;
Urban car.