

# INFORMATION SOCIETY TECHNOLOGIES (IST)

## PROGRAMME



### AIDE IST-1-507674-IP

#### Driver-vehicle interaction and communication management

Deliverable No.		<b>D3.4.1</b>	
SubProject No.	<b>SP3</b>	SubProject Title	<b>Design and Development of an Adaptive Integrated Driver-Vehicle Interface</b>
Workpackage No.	<b>WP3.4</b>	Workpackage Title	<b>Adaptive Interface Design and Development</b>
Activity No.		Activity Title	
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## EXECUTIVE SUMMARY

The aim of the Deliverable 3.4.1 “Driver-vehicle interaction and communication management” is to define the logic and the structure of the AIDE HMI and of the Interaction and Communication Assistant (ICA), the system responsible for the centralised management of the information and the adaptive interface functions, able to manage the information data flow on the basis of the traffic and environment assessment, as well as of the level of activity of the driver in the primary and secondary tasks.

The main requirement for the AIDE HMI is to improve driver-system interaction in terms of distraction and usability to increase driving safety and improve users’ comfort. In order to reach this goal the AIDE system, in contrast to usual approaches, has to focus on:

- considering the effects of HMI interdependences, i.e. preventing interference among different I/O events presented at the same time to the driver;
- taking into account the driving situation, driver state and driver preferences to adapt the HMI depending on these conditions, i.e. the interaction may be changed in critical conditions or according to preferences to reduce driver’s distraction and to draw driver’s attention to the driving task;
- including nomad devices in a common in-vehicle HMI in a way that they do not differ in terms of the HMI strategy from the integrated applications.

Consequently, the AIDE system has to offer specific functionality for HMI adaptation and I/O management. Thus, a central intelligence controlling the interaction between the driver and the system, integrates IVIS and ADAS applications according to the availability of driver’s status, driving situation and driver’s preferences. This intelligence is called “Interaction and Communication Assistant (ICA)” and ensures that the information is given to the driver at the right time, in the right way and only if relevant or compatible with the present driving context. The core functions to be performed by this intelligence are named AIDE meta-functions and they are listed below:

- **Derivation of priorities for the individual (inter-) actions.**
- **Conflict recognition for the actions taking into account:**
  - *the user needs (driver model)*
  - *the environment model*
  - *the HMI strategy and philosophy*
  - *the I/O constellation*
- **Selection of a conflict solution:**
  - *time scheduling*
  - *change spatial layout (location)*
  - *channel selection/alteration*
  - *modality selection/alteration*
  - *change the physical layout (volume, size, form, colour)*
- **Device allocation (control the access on I/O devices).**

To perform these meta-functions, ICA has to be aware of the driver, the vehicle and the environment states as estimated by other components of the global AIDE system, which are the DVE modules.

It has to be stressed that there exists no "best in-vehicle HMI". Thus, the most crucial requirements for the ICA system are derived from the fact that the HMI is strongly competitive and OEM specific. So, ICA, as all the main components of the AIDE system needs to be flexible and scalable concerning the detailed system behaviour, the extent of applications and the I/O device constellation. This leads to the requirements of modularity and independence among individual components. Also the way to describe and implement the strategies and the rules that have to be applied by ICA should be generic enough to be adaptable to every possible OEM specific strategy.