City Car Prototype

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AIDE Project

Adaptive Integrated Driver-Vehicle Interface

4 years duration

Started: March 04

Budget: 12.5 ME (Total), 7.3 ME (EU funding)

28 partners (industry-academia division)

AIDE core group: VTEC (coordinator), BMW, Bosch, CRF, ICCS, JRC, PSA and TNO

AIDE objectives

The general goals of the AIDE IP are:

•To design an **adaptive human machine interface**, taking into account the driver state, environment and the vehicle parameters.

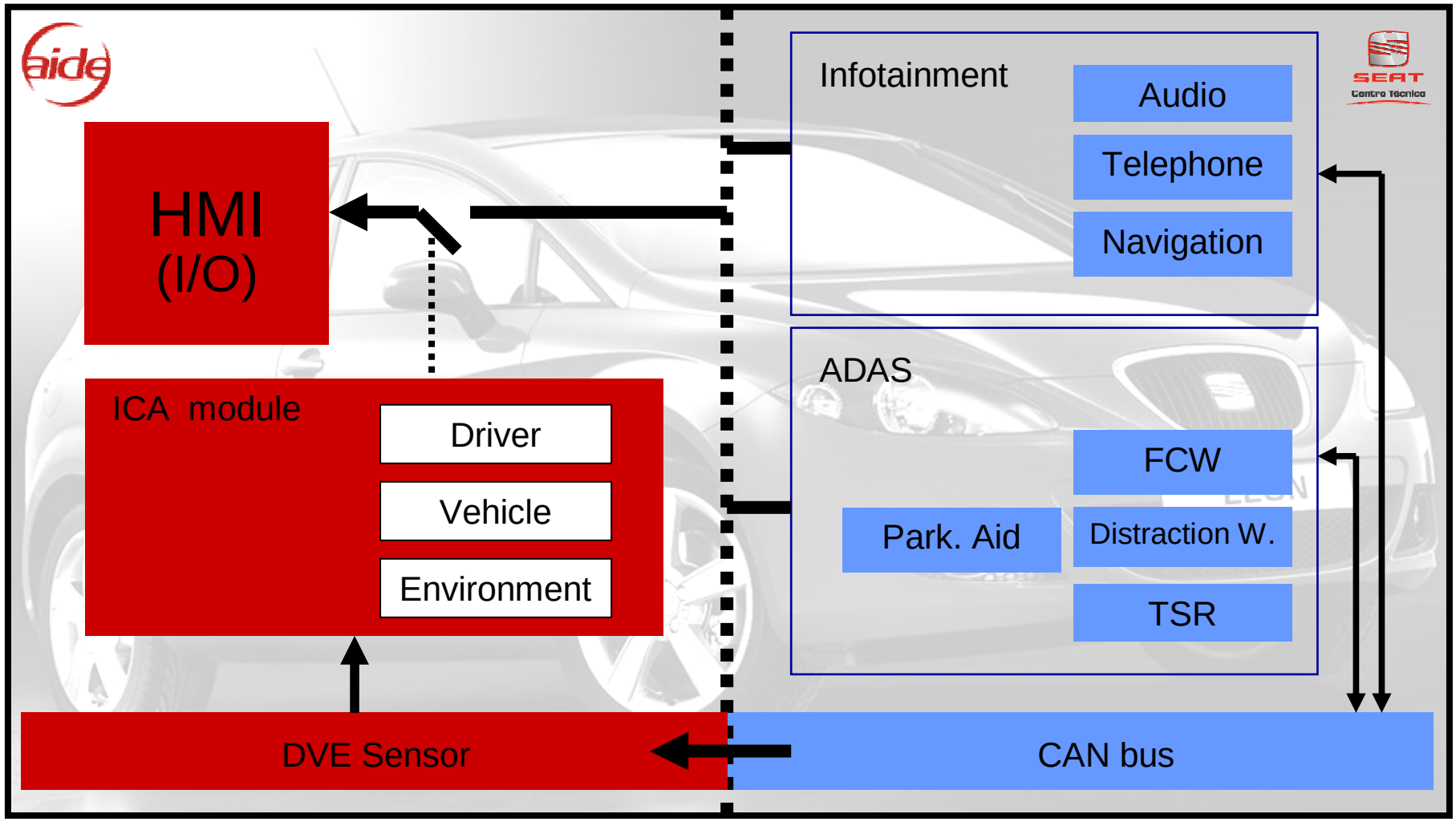
•To develop the evaluation methodologies for this adaptive HMI.

Truck (VOLVO)

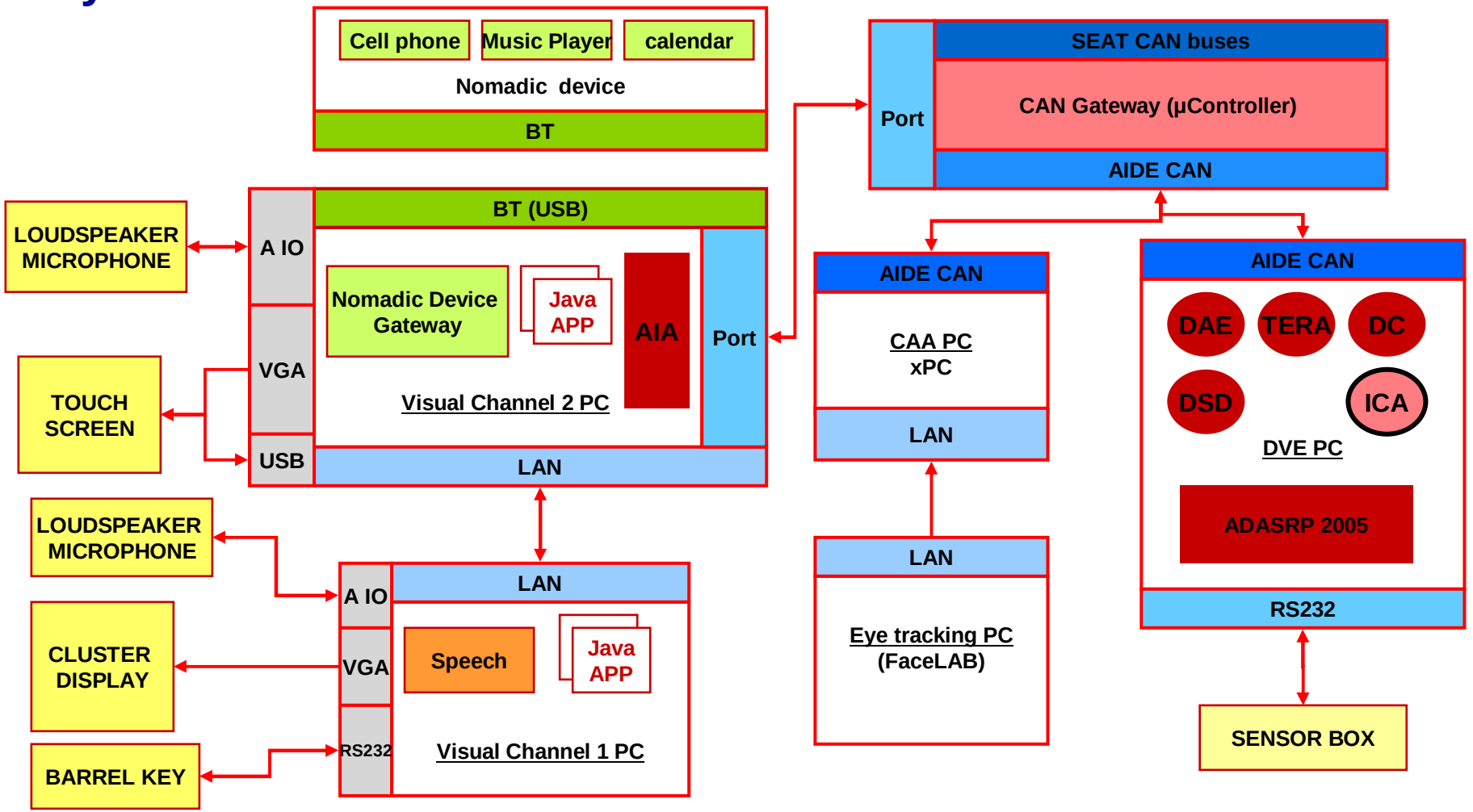
City car (SEAT)

Luxury car (FIAT)

Logic Diagram



Physical Architecture

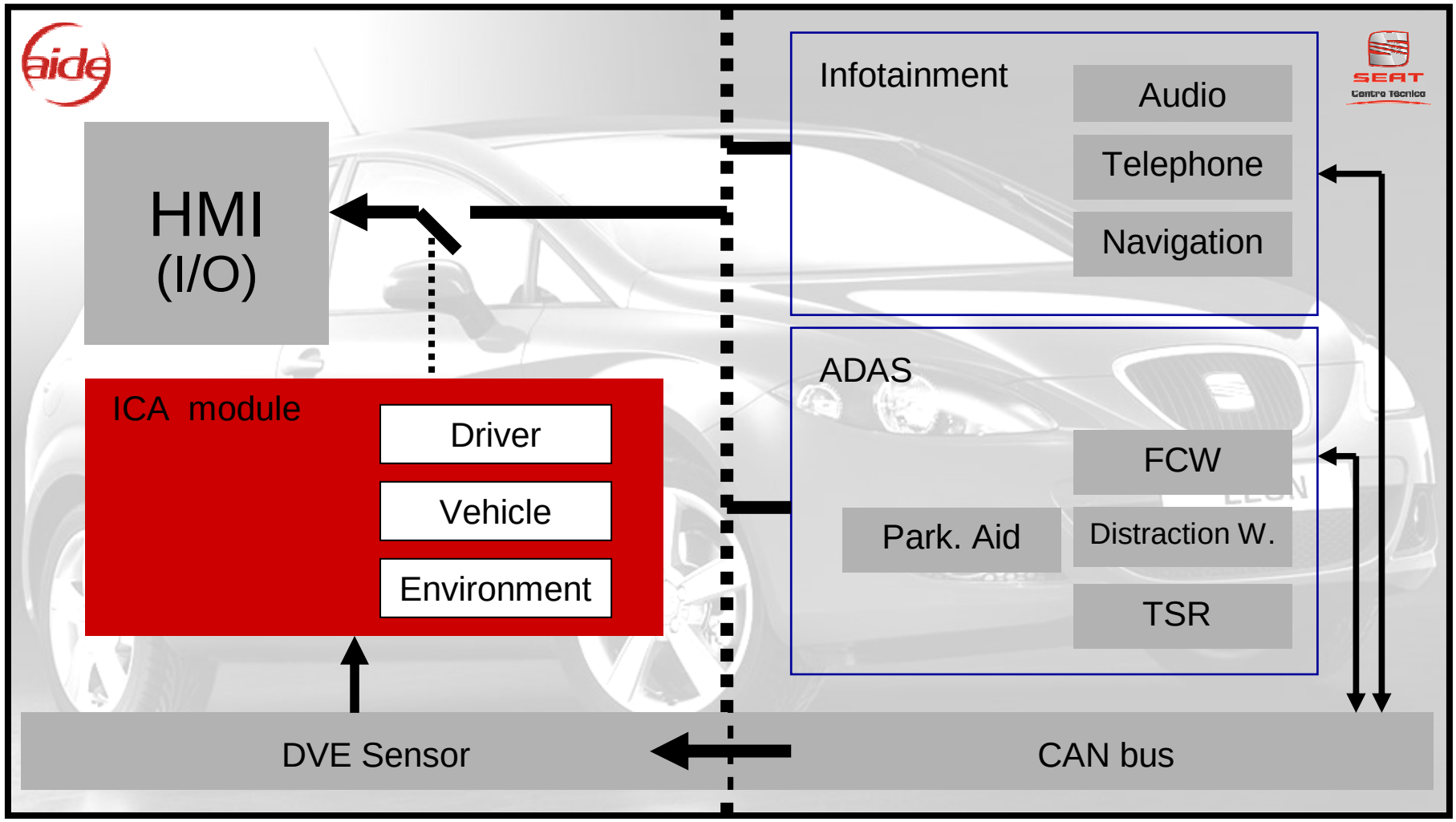


AIDE components

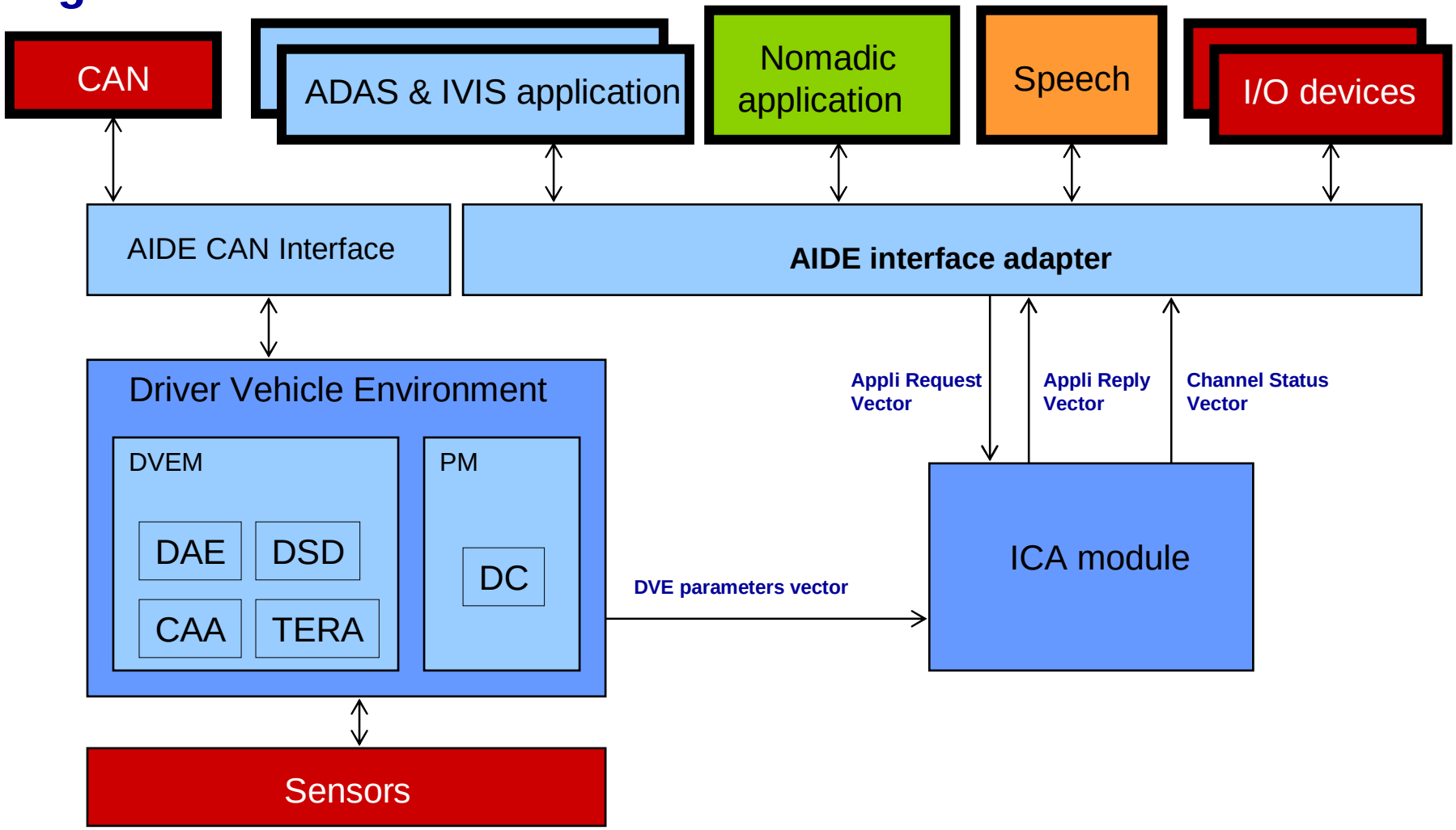
Systems	Module	Type	Responsible partner
AIDE SW	ICA module	S/W	DIBE
	DC (DVE module)	S/W	CERTH
	TERA (DVE module)	S/W	ICCS
	CAA (DVE module)	S/W	VOLVO
	DSD (DVE module)	S/W	SIEMENS
	DAE (DVE module)	S/W	INRETS
	DVE Perception Platform	S/W	ICCS
	DVE Processing Unit	H/W	SEAT
IVIS & ADAS Systems	Nomadic device	H/W	MOTOROLA
	ND gateway	S/W	MOTOROLA
	Audio (mp3, Cd, radio)	S/W	SEAT
	ADAS systems	S/W	SEAT
	Instrument cluster processing unit	H/W	SEAT
	Secondary display (SID) and its processing unit	H/W	SEAT

Systems	Module	Type	Responsible partner
HMI	Speech input	S/W	NUANCE
	Haptic barrel key	H/W	TELENOSTRA
	Microphone	H/W	SEAT
	Loudspeaker	H/W	SEAT
	Look and feel	S/W	SEAT
Sensors	Gateway from car network to AIDE network	H/W	SEAT
	Sensor Box	H/W	SEAT
	ADAS compliant maps	S/W	SEAT
	ADASRP 2006	S/W	SEAT
	Frontal radar	H/W	SEAT
	Driver looking camera(s) + image processing unit	Both	SEAT
	Logging setup	S/W	SEAT

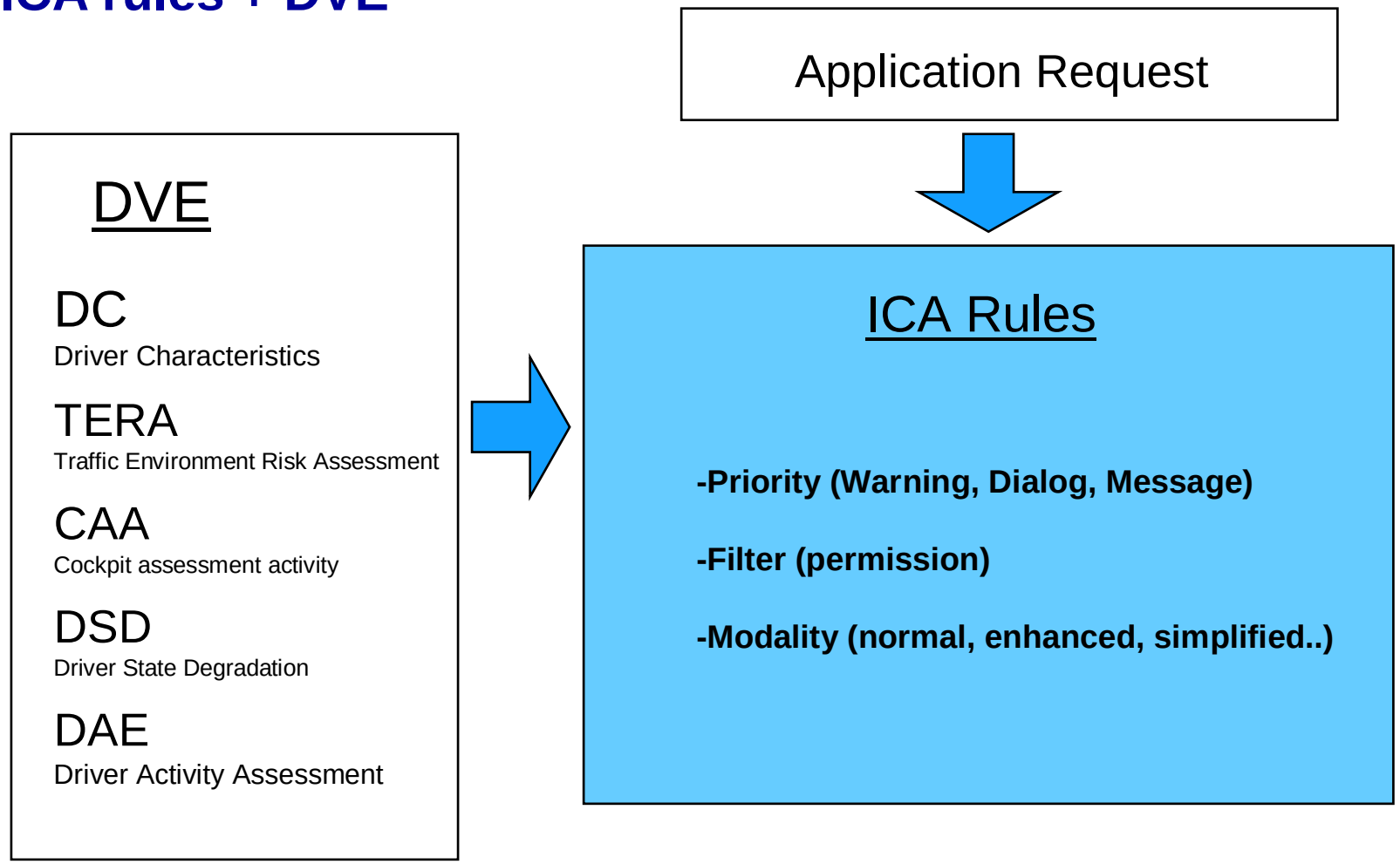
AIDE system


HMI
(I/O)
ICA module
Driver
Vehicle
Environment
Infotainment
Audio
Telephone
Navigation
ADAS
FCW
Park. Aid
Distraction W.
TSR
DVE Sensor
CAN bus

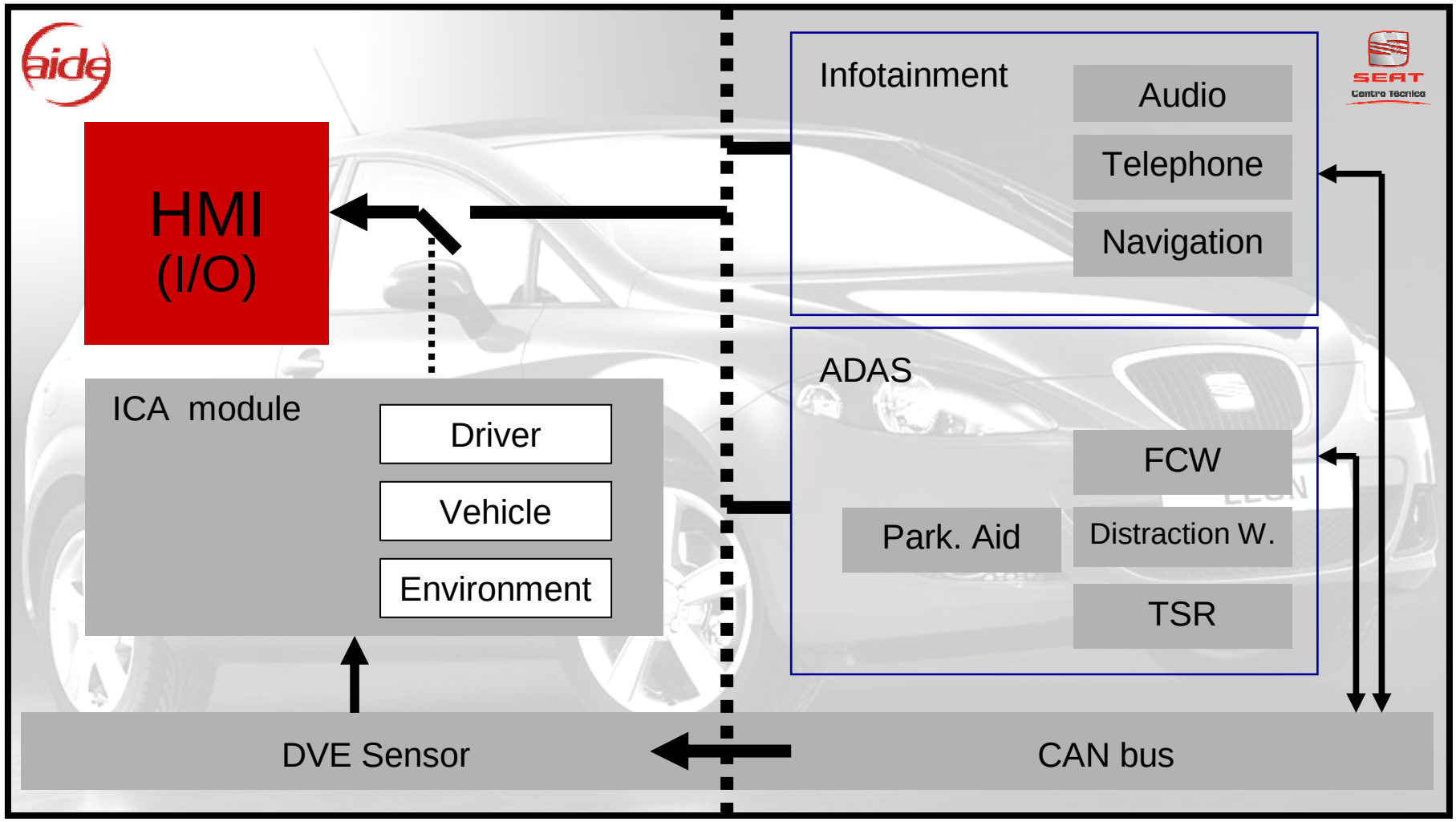
Logical Architecture



ICA rules + DVE



HMI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HMI: I/O devices

Inputs: Barrel key (Telenostra)
Dedicated buttons, Stalks..
Tactile (on touch screen)
Voice (Nuance)

Outputs: Configurable display in cluster
Touch screen in console
Loudspeakers
Voice (Nuance)

Photomontage of SEAT HMI

HMI: I/O devices – Main elements

Haptic Barrel key + TFT

This display shows:

- Driving information (warnings, active safety information..)
- Basic information concerning infotainment systems (phonebook, list of directions..)

TFT + Haptic Barrel key

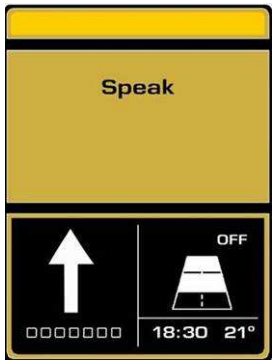
Touch Screen

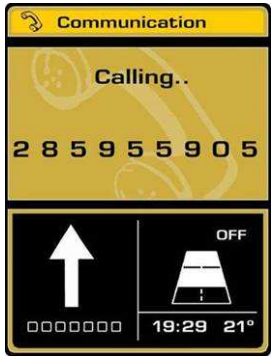
- It is used for managing the infotainment systems and introducing the driver characteristics. The data will be sent to ICA.

Touch screen

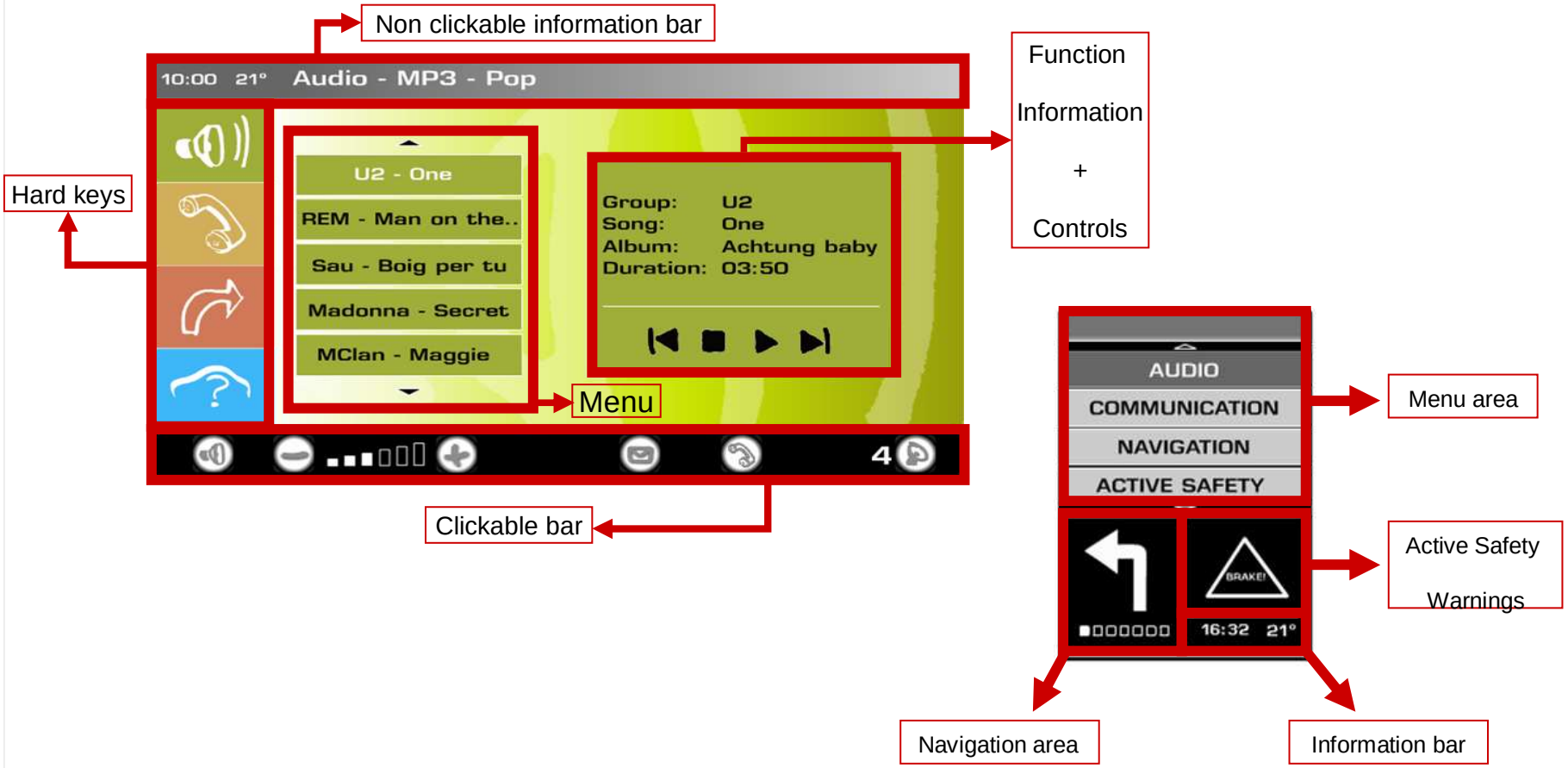
Voice recognition

- Speech UI specs
  - -Activation by means of stw PTT
  - -Dialog definition
  - •Languages: English
    - •Features:
      - - Voice Activated Dialing
      - - MP3
      - - SMS Evaluation

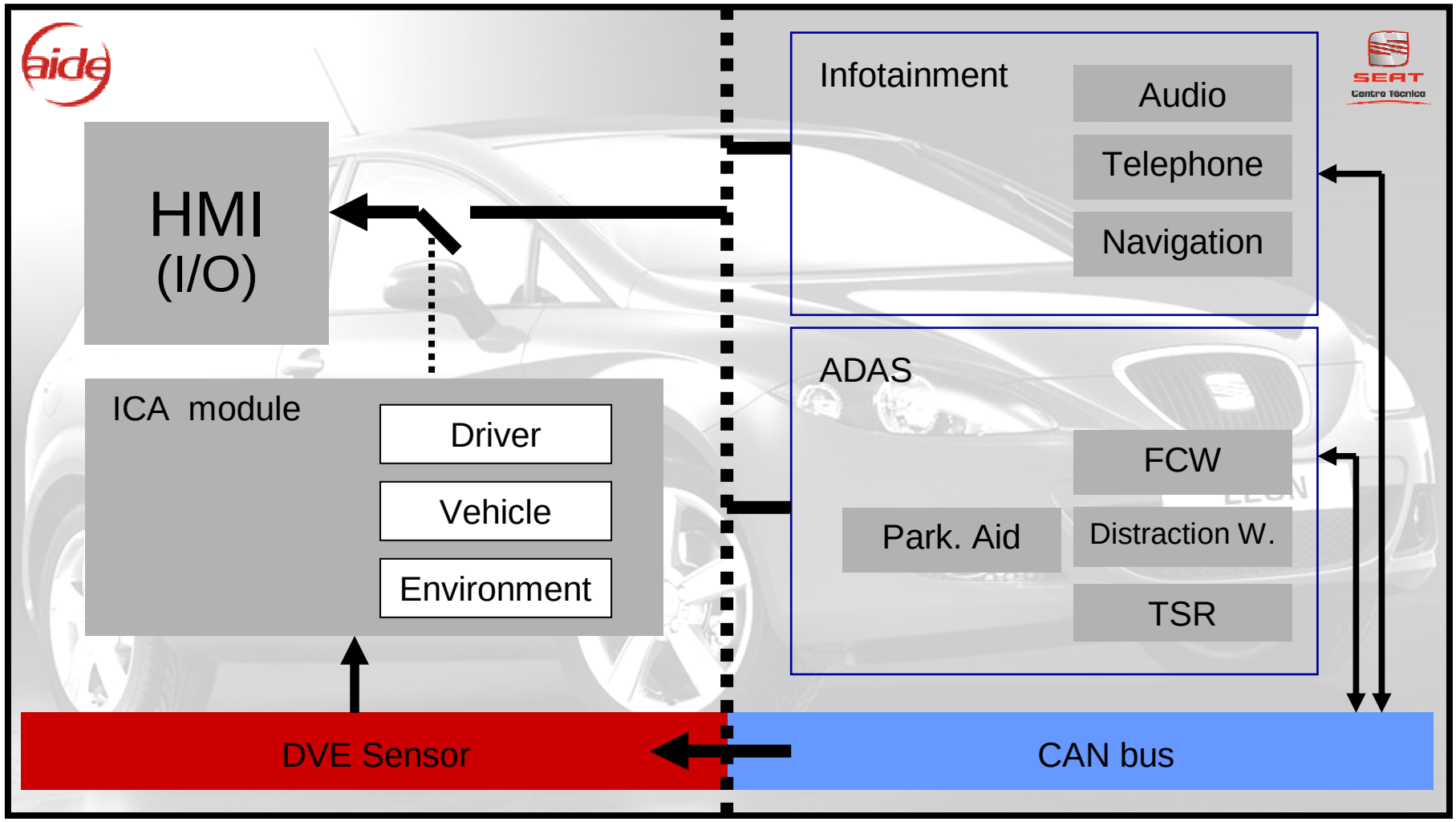




HMI definition



Sensors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DVE sensors

Sensor system/ information provider	Description	DVE monitoring modules using it	Interface
Radar		DSD (Driver State Degradation) DAE (Driver Activity Assessment) TERA (Traffic Environment Risk Assessment)	CAN
Eye-/head movement sensor	FaceLab	CAA (Cockpit assessment activity) TERA (Traffic Environment Risk Assessment)	Ethernet
Eye closure sensor	Facelab	DSD (Driver State Degradation)	Ethernet
GPS	Sensor Box	DAE (Driver Activity Assessment) TERA (Traffic Environment Risk Assessment)	Serial
Map database	Navteq	DAE (Driver Activity Assessment) TERA (Traffic Environment Risk Assessment)	

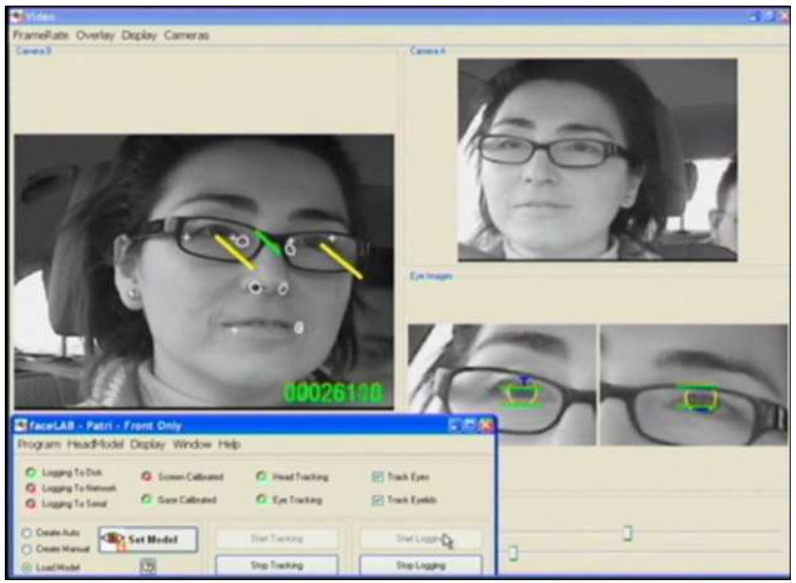
DVE- Eye tracking

- CAA - Cockpit assessment activity

This system is used for monitorize the driver activity and its workload

- DSD - Driver state degradation

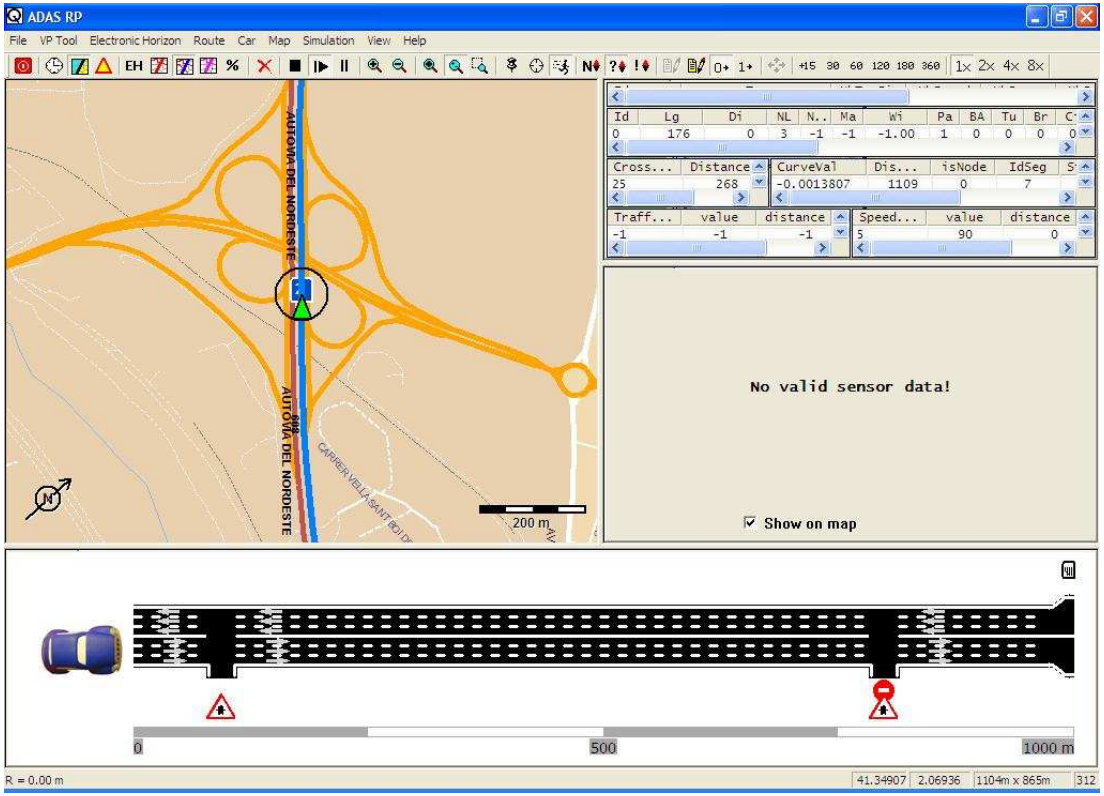
It measures the driver mitigation



DVE- ADASRP + map data

ADASRP is a SW that is able allocate the car in a cartographic database, extracting the environment data of each place.

Using an advanced map database this program can foresee the most likely path.



ADSRP AIDE plugin

Sensor Box

AIDE CAN data

CAN gateway

-Read from CAN SEAT

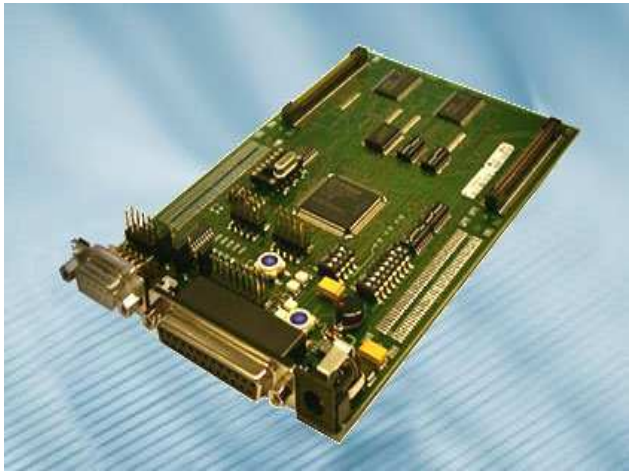
-Identify the necessary SEAT frames

-Translate to AIDE format

-Send frames to CAN AIDE

-Receive from CAN AIDE

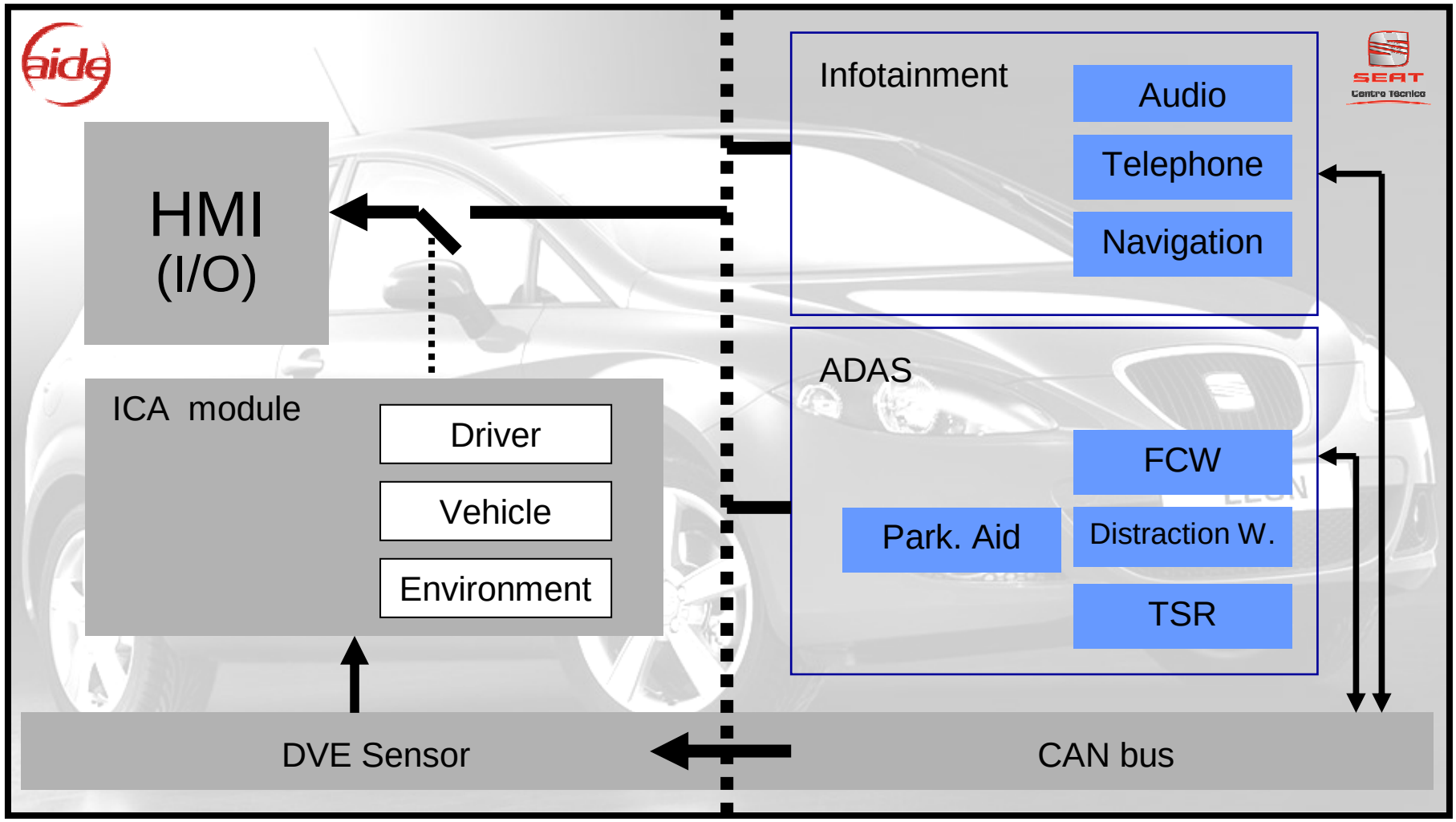
-Send and receive events to/from visual PC2



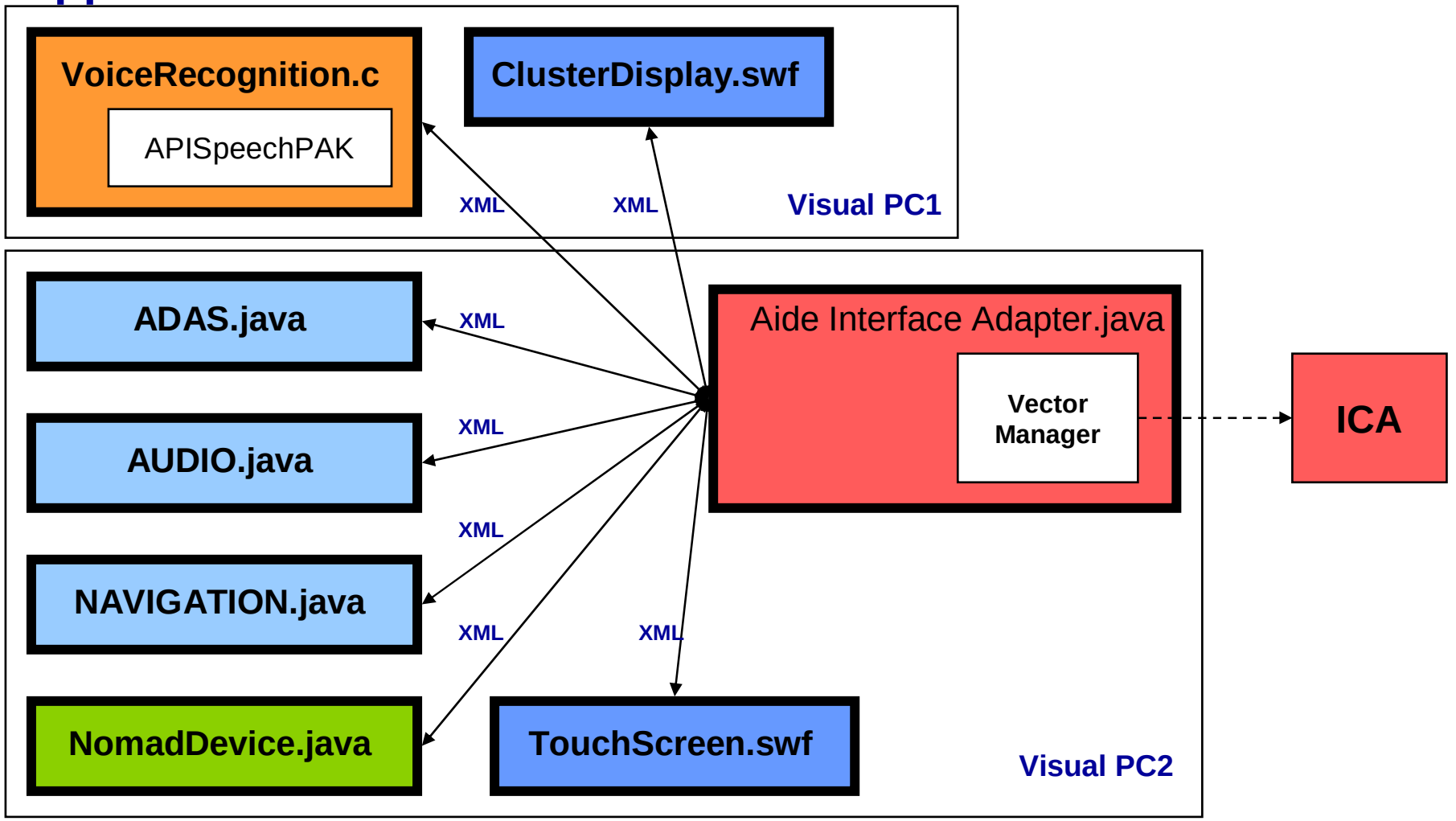
µController with CAN transceiver

Velocity	*ESP Lamp Fail Status*	*High Beam Light*
Yaw Rate	*Airbag Lamp Fail Status*	*Fog Front Light*
Throtle Pedal Position	*ABS state*	*Fog Rear Light*
Brake Pedal Position	*ESP state*	*Park Rear Light*
Gear Position	*Travel Distance*	*Right Flashing Light*
Steering Wheel Angle	*Radar*	*Left Flashing Light*
Head lamps	*Parking Light*	*Wiper Position*
ABS Lamp Fail Status	*Low Beam Light*	*Warning*

Applications



Application structure



Nomadic Device

Features
-Calendar
-Telephony
-SMS
-Music

Timing

All systems integrated → M36 (Feb07)

City car prototype ready → M40 (Jun07)

Validation with users → M46 (Dec07)

Events

ITS World congress

8/12 October 2006

http://www.itsworldcongress.com

PREVENT IP exhibition:

September 2007

http://www.prevent-ip.org/

AIDE user forum: AIDE closure

February - November 2008

http://www.aide-eu.org/

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