



International
Telecommunication
Union

A stylized yellow car icon with a red swoosh line trailing behind it, positioned behind the title text.

THE FULLY NETWORKED CAR

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PSA PEUGEOT CITROËN 

Geneva, 7-9 March 2007

- Eighty percent of innovation is Electronic
- Impossible to comply with regulations without Electronic systems
- 10 to 30 % of the cost is Electronic
- 7 % of silicon market is Automotive
 - Big enough but not sufficient to support several competitive technical solutions
- The price of cars must decrease drastically
 - Electronic must do more with less

Today's electronically controlled Functions

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- Anti brake system
- Immobilizer
- Lane departure
- Anti skid regulation
- Automatic transmission
- Exhaust gas recirculation
- Electronic stability program
- Particulate filter
- Adaptative Cruise Control - Stop and start
- Variable valve timing
- Hill assist
 - Thanks to smart electronic architecture and system's cooperation the cost can be acceptable

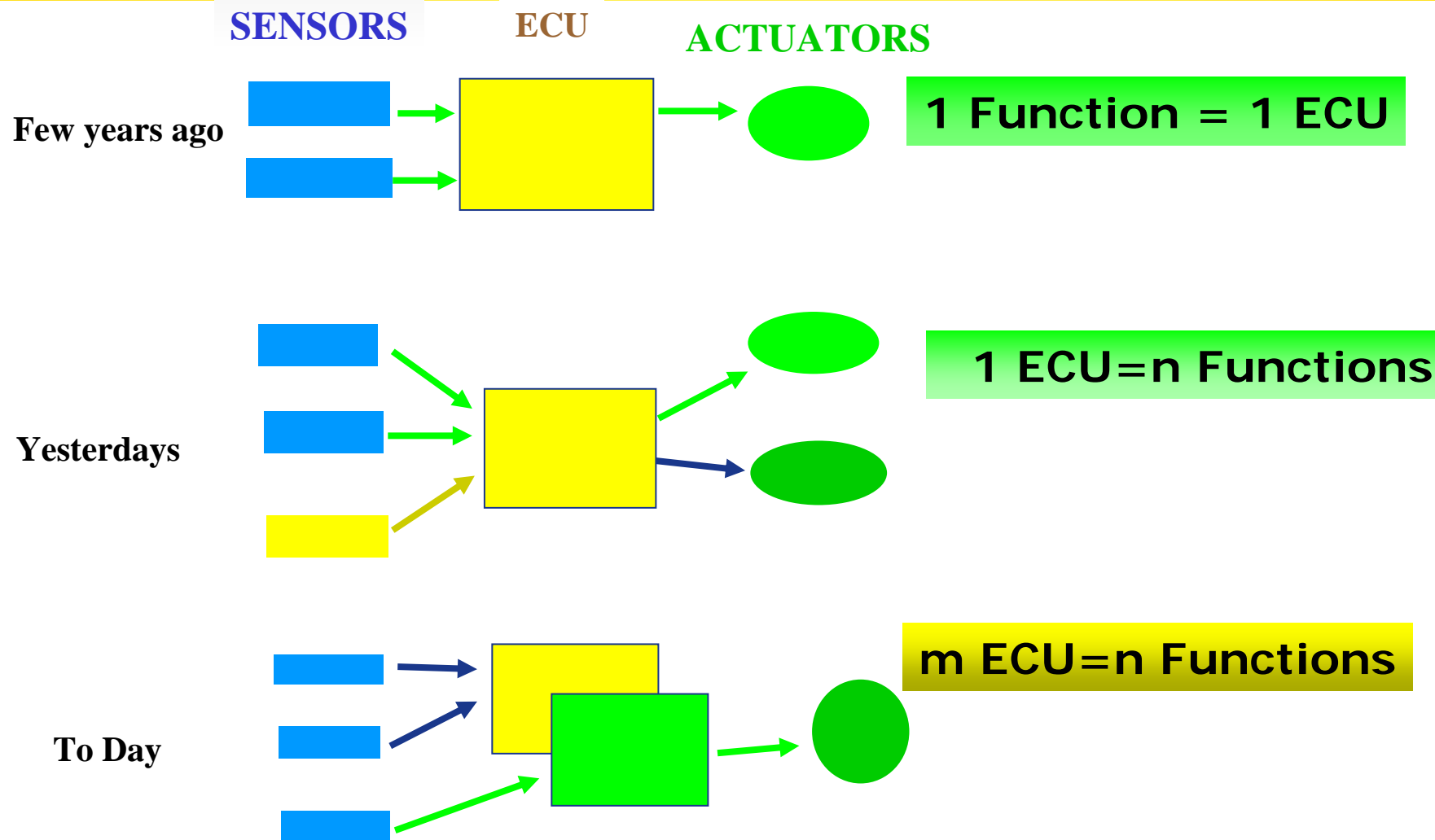
What does cooperation mean?

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- A long time ago 1 function is made up of: sensors, **E**lectronic **C**ontrol **U**nit and actuators i.e. one set for each function
- Cooperation comes when same ECU drives several functions and share sensors with others
- The multiplex network is the normal way to implement cooperative systems
- Consequences
 - Economy
 - Induction of new functions for free
 - More efficient control and command

Evolutions of ECU organisation

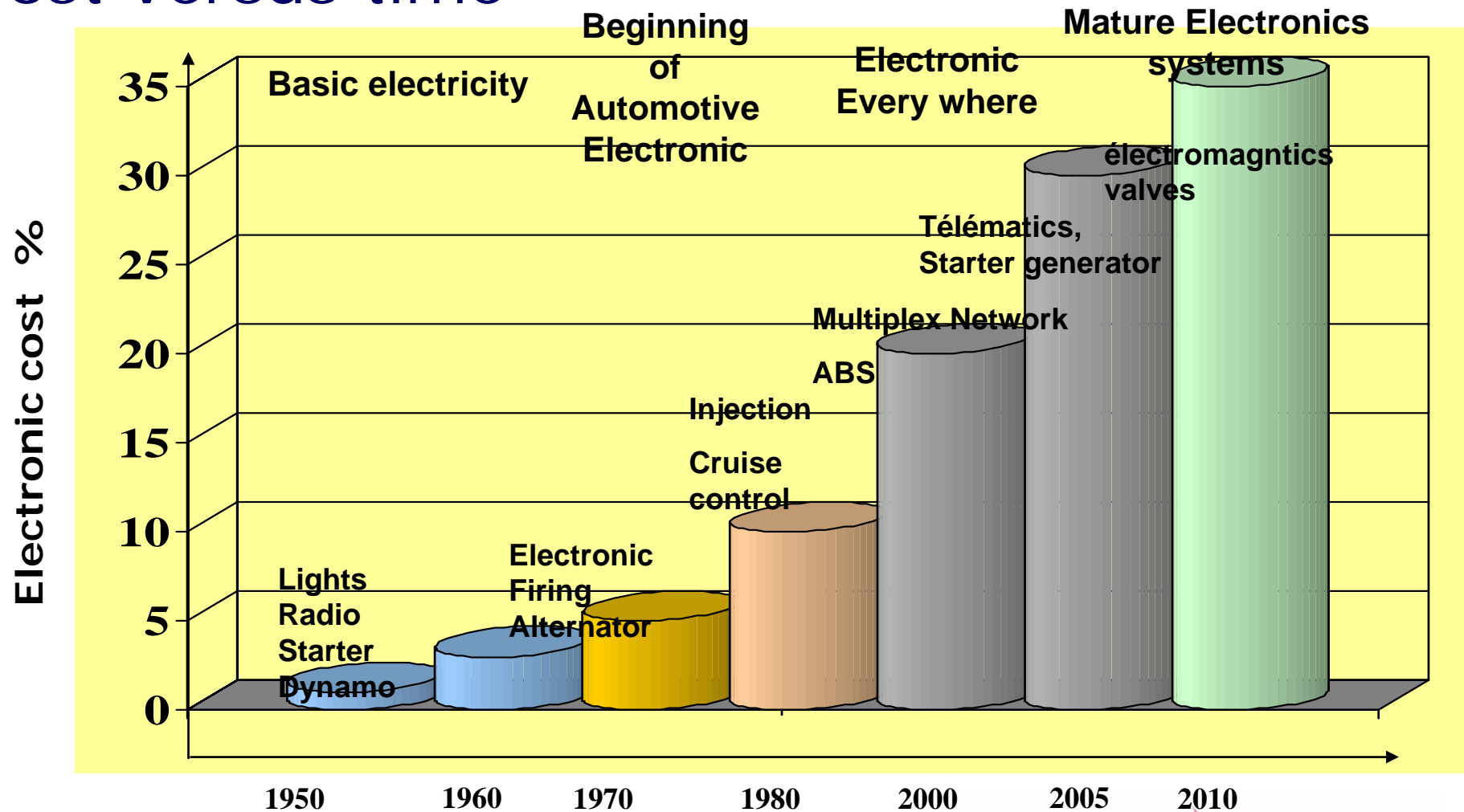
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Automotive Electronic Story

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Cost versus time

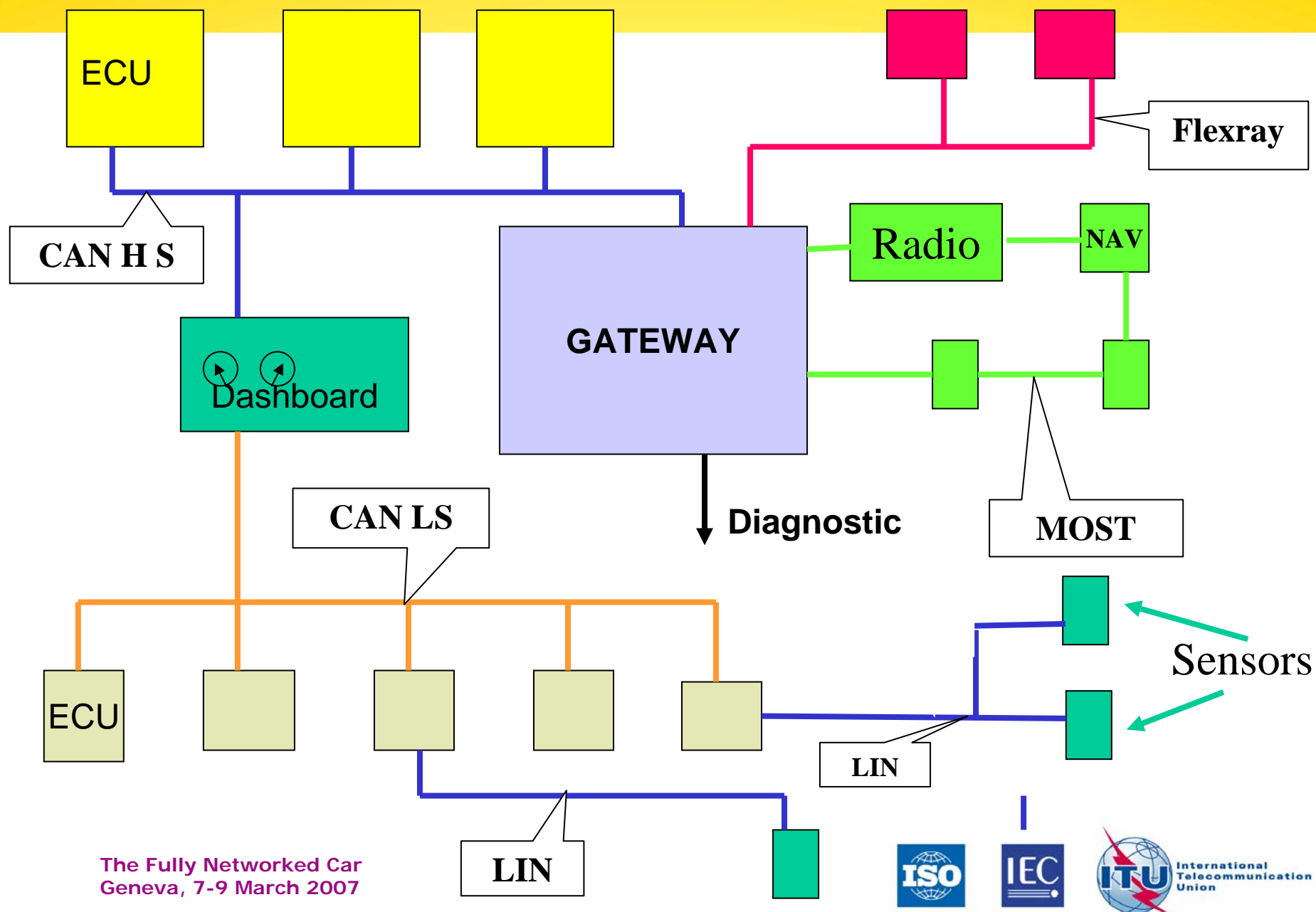


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Modern vehicle electronic architecture

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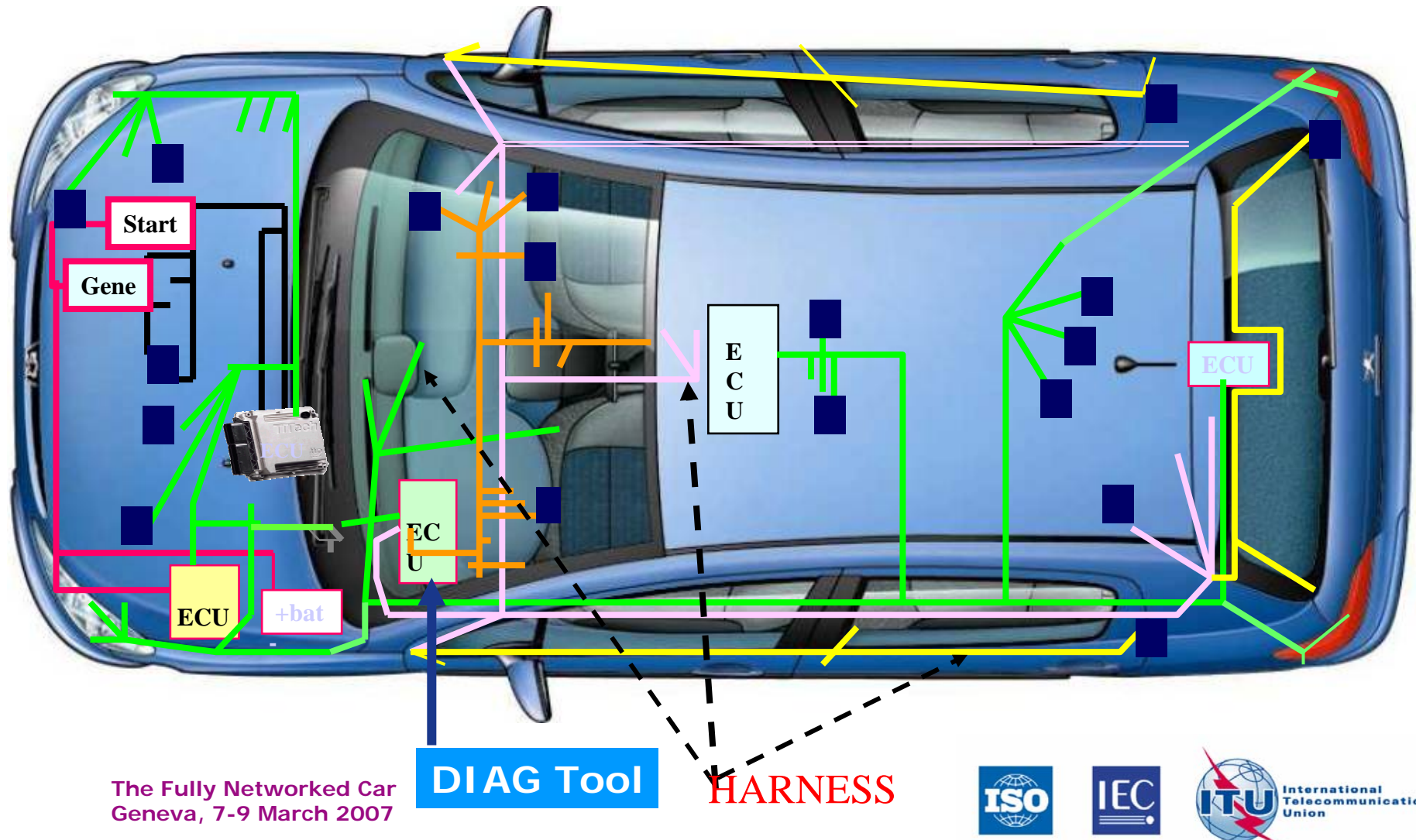


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ISO Role in Hardware and Software

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In the electronic network: ECUs HW & SW, Wires, connectors, data transmission, protocol...there are ISO specifications



Example of ISO Standards

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- o Network HW & SW
- o 11898 CAN
- o 14229 UDS
- o 15031 OBD
- o 17356 OSEK Software
- o 14230 KWP200
- o 15765 Diag on CAN
- o 22900 MVCI
- o 22901 ODX
- o 22902 API Telematics
- o 26262 Functional safety
- o Functions & Telecom.
- o 15622 ACC
- o 15623 FVCWS
- o 17361 LDWS
- o 17386 MALSO
- o 17387 LCDA
- o 22178 LSFS
- o 21210 CALM System
- o 22179 FSRA
- o 22837 Probe Data
- o 24535 Basic EVI

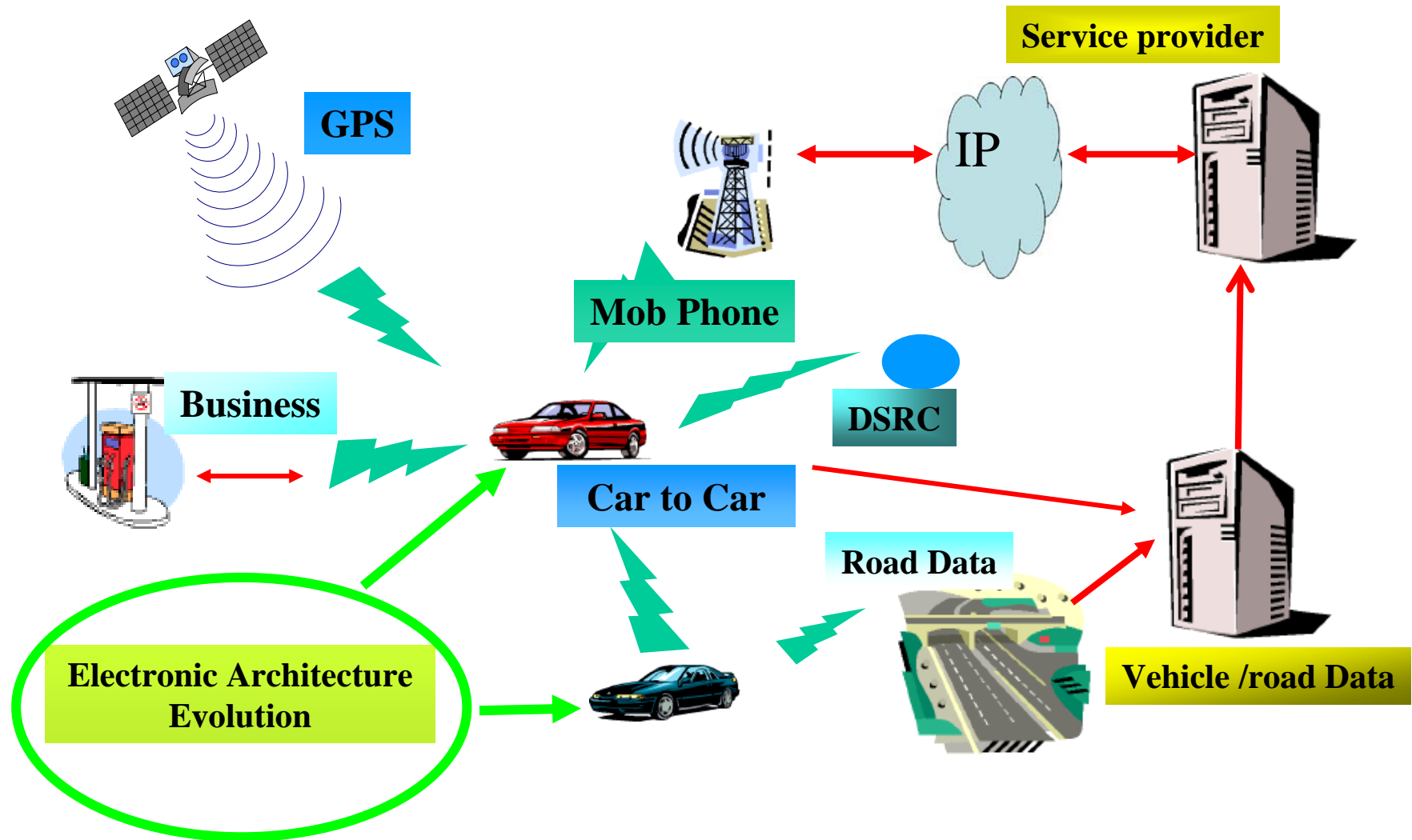
Is the car a closed word ???

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- Some functions can stay alone
 - Engine control
 - ABS
 - Climatisation
- Some must communicate with outside
 - Autonomous cruise control
 - Lane departure warning system
 - Automatic Parking
 -
 - And entertainment : **Radio, Video, Mob phone, E mail, Internet, Toll fees , Emergency Call, Navigation....**

The Car is looking Outside

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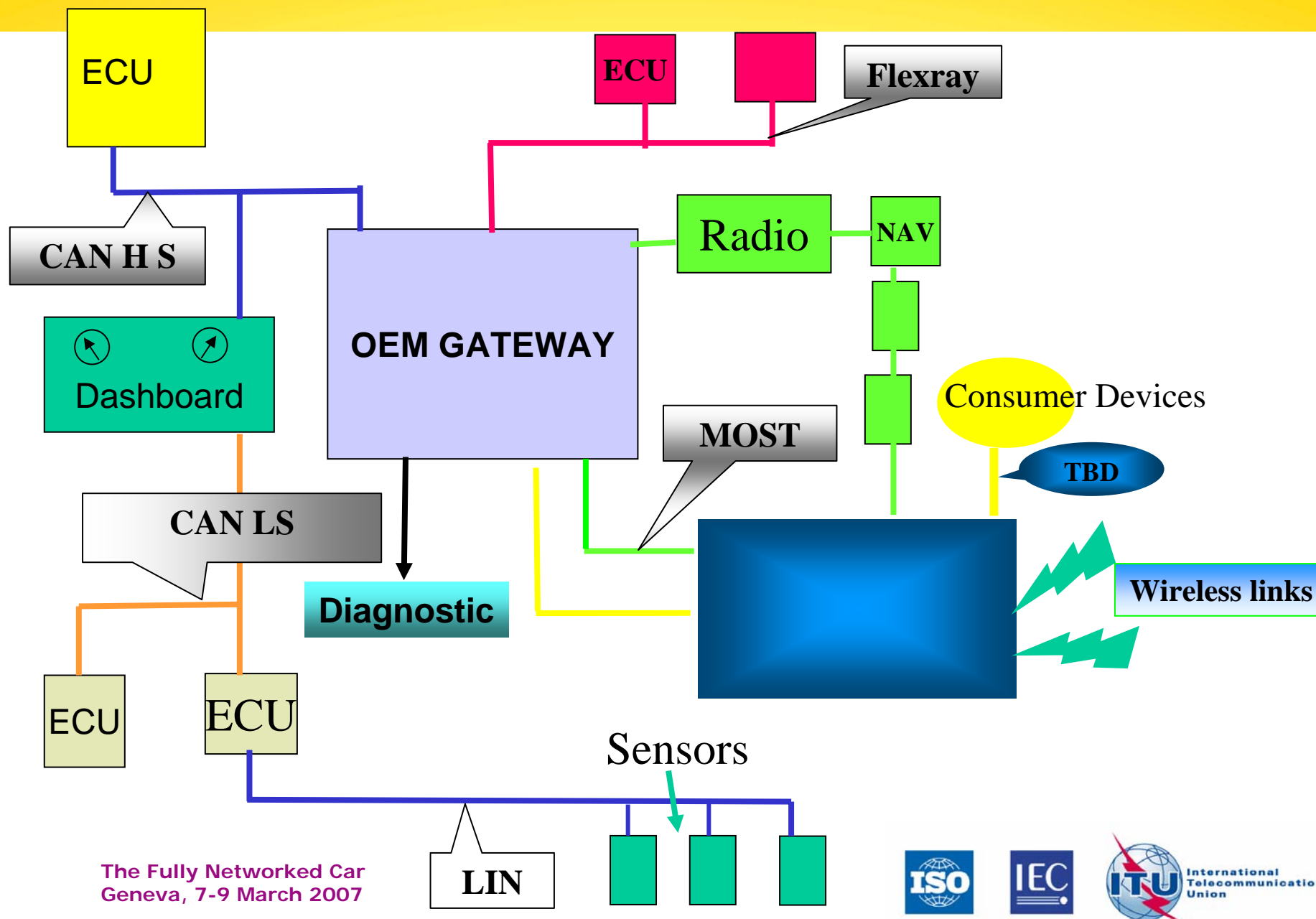


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Networked CAR Electronic architecture

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- o Electronic Architecture inside Vehicle
 - ISO Standards TC22/SC3
 - De Facto standards: CAN, OSEK, MOST, Flexray, LIN, Autosar, AMI-C
 - **A few are also basis for ISO**
- o Communication V/V & V/I
 - ISO Standards TC204
 - ITU
 - Telecom industry
 - Informatics industry

Thank you for your attention

o Dr Pierre Malaterre

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