association for standardisation of automation and measuring systems

ASAM

Association for **S**tandardization of **A**utomation and **M**easuring Systems

ASAM Standards and Electro-mobility

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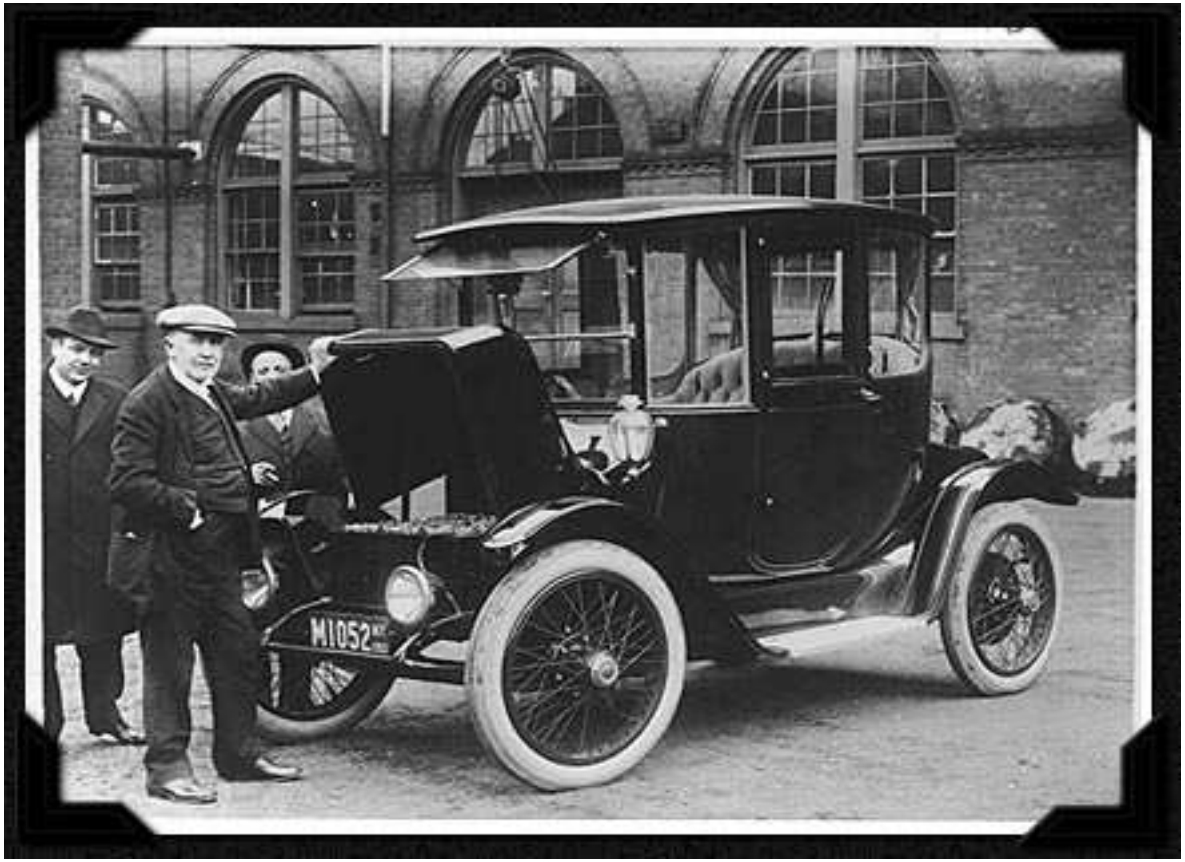
ASAM

Electric propulsion in the past



Edison Electric Car of 1913 (picture by Wikipedia)

Electric propulsion then and now

Video: Courtesy of NZZ FORMAT

Electric propulsion today

- Internal combustion propulsion is well established, electric propulsion is seen as “complicated”
- Only few EVs are on the street today
- Various technical and commercial questions are open
- Electric propulsion calls for a new integrated mobility concept
- No cooperation but individual solutions are pursued
- US and Europe are not in the lead
- Big investments are necessary, do we need electric propulsion at all?

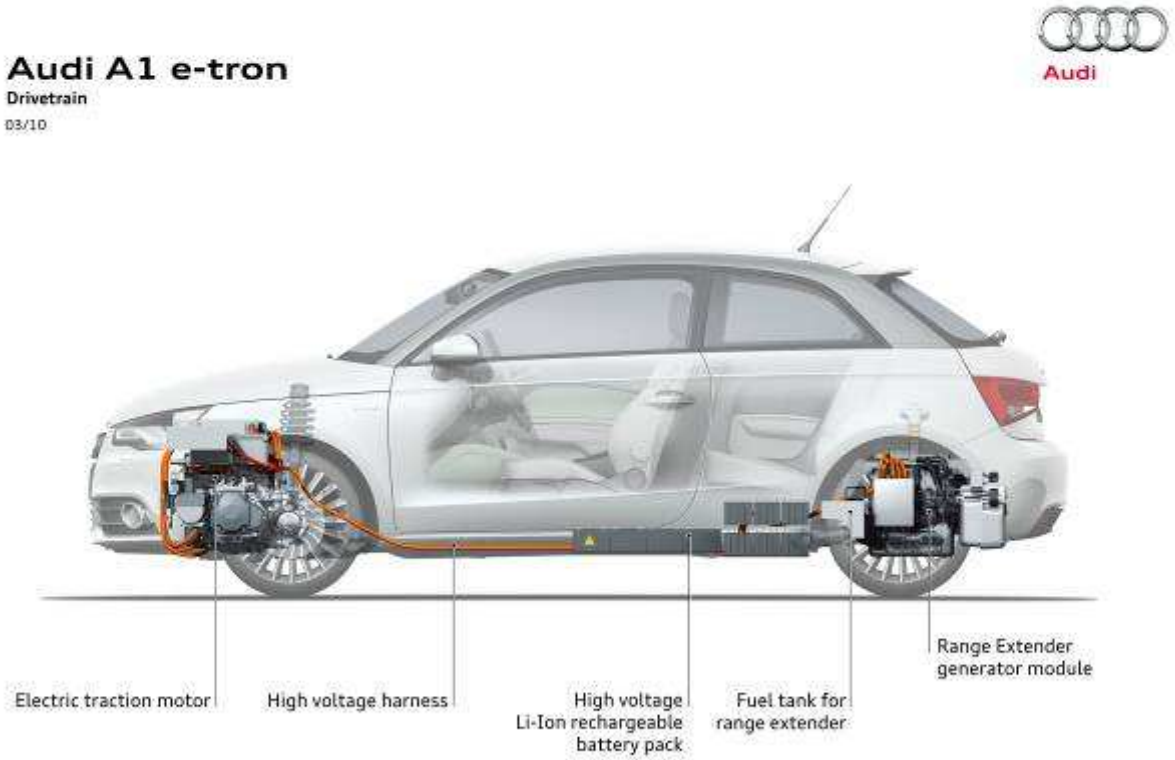
US and Europe are not in the lead

Chart courtesy of www.emerging-markets-trader.de

Do we need electric propulsion at all?

- Mobility is the basis of our style of living
- 97 % of CO2 emissions derive from natural origins, out of the remaining 3% anthropogene emissions derive only 11% from the circulation
  (Prof. Lenz, Technical University of Vienna, 10.03.2010)
- New liquid petrols (e.g. natural gas liquids, non-conventinal oil, …) will fill in for the declining availability of crude oil
  (Prof. Lenz, 10.03.2010)
- Ecological desasters call for replacement of crude oil
- The „race for electric propulsion“ is on!

Electric propulsion today



Picture by courtesy of AUDI AG

Electric propulsion today

Dr. Martin Winterkorn, VOLKSWAGEN AG:

More than 8% of the German vehicle owners believe, that the EV is available today!
(TNS/Infratest 07.05.2009)

Dr. Karl-Thomas Neumann, VOLKSWAGEN AG:

We will have an E-module concept that may be integrated in all VOLKSWAGEN makes
(ATZonline, 27.04.2010)

Situation of research and development

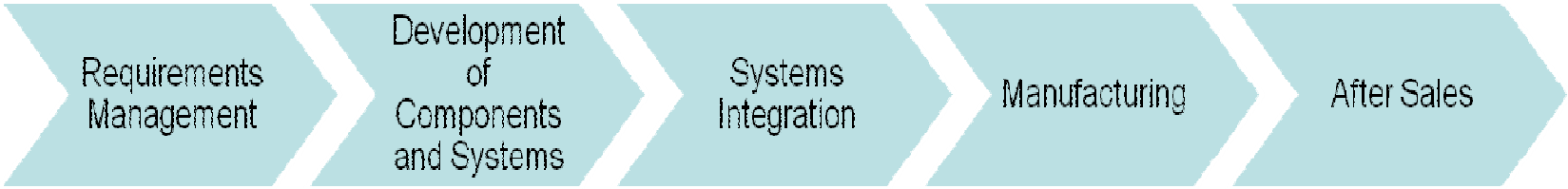
- Limitation of time and resources
- Basic questions have to be solved
- Key component „battery“, batteries and their management are seen as competitive critical and call for manufacturers´ individual solutions
- New unexpected results call for comprehensive data for quick changes and new directions of research

Report from some model regions

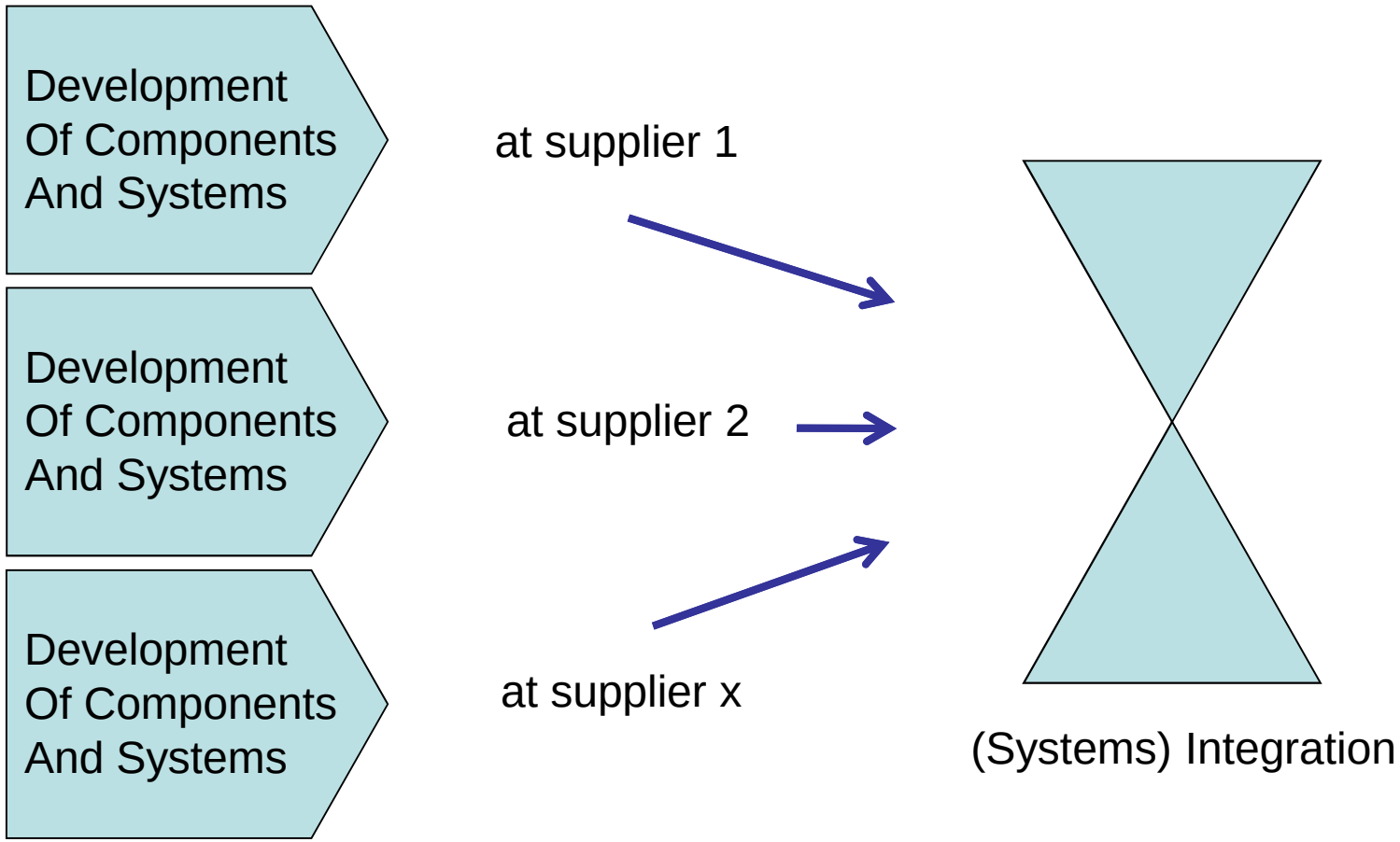
Bundesverband **eMobilität** e.V.

- **Berlin – Potsdam**
- **Bremen – Oldenburg**
- **eE-Tour Allgäu**

Process Flow in projects



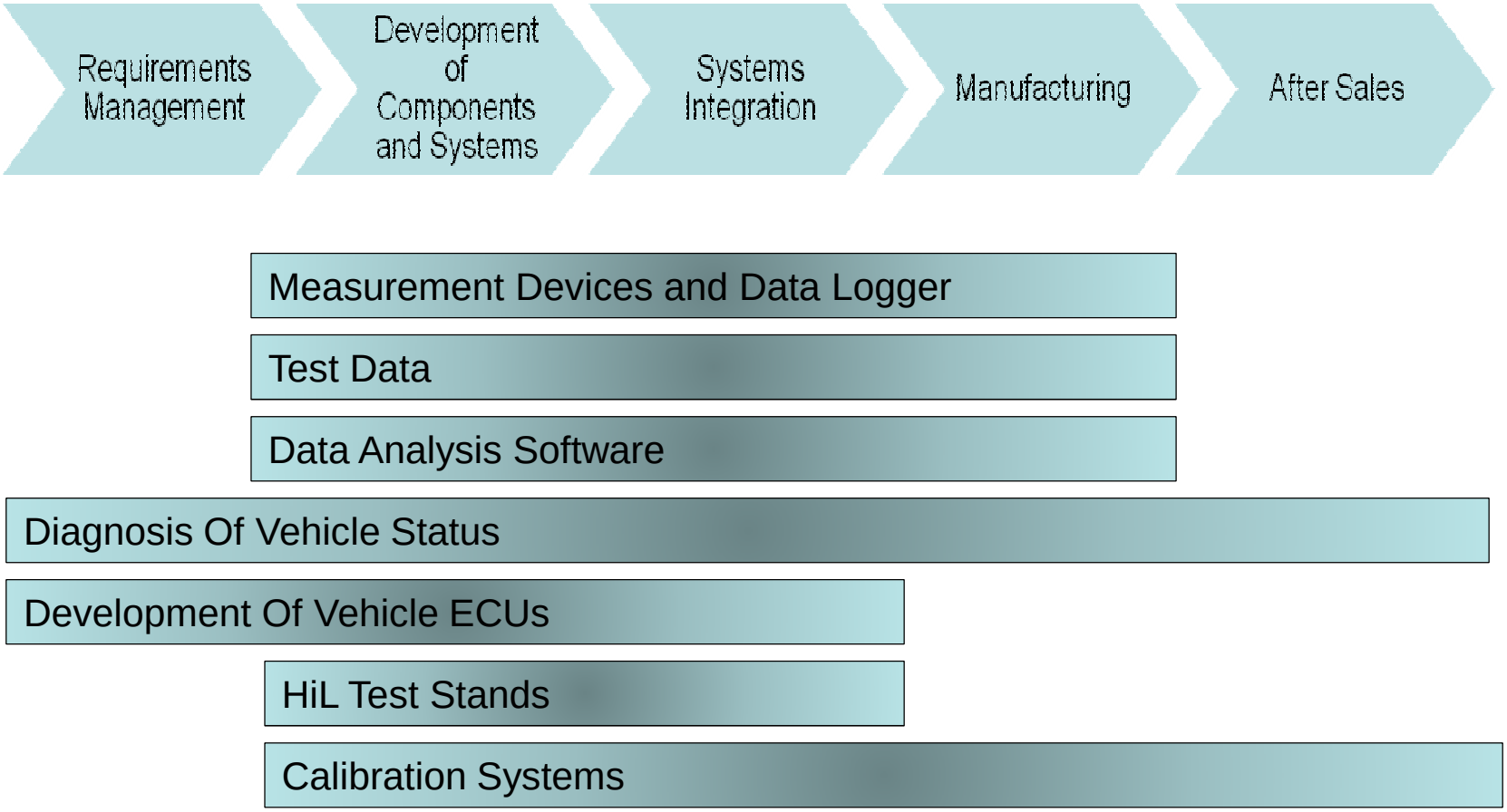
Manufacturer / Supplier Relationship



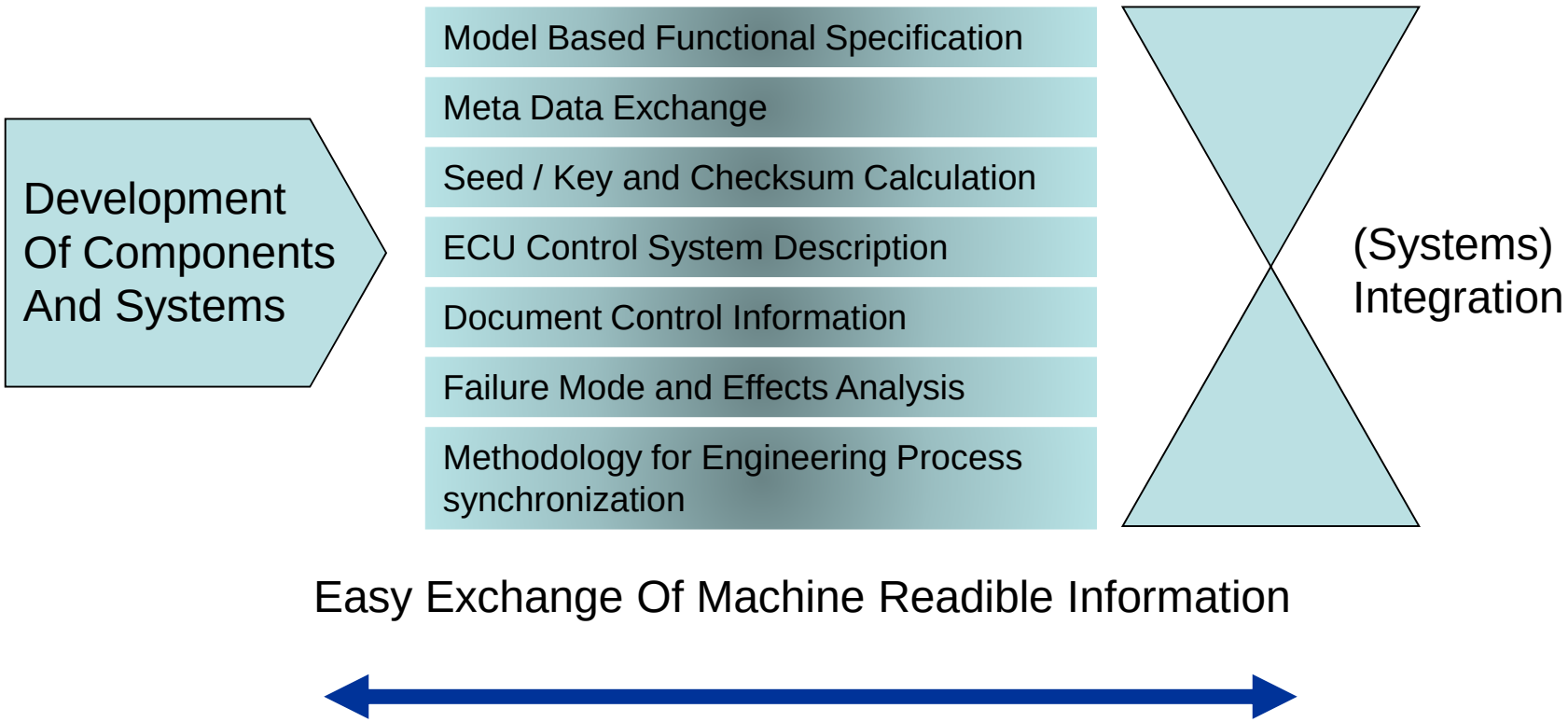
Advantages of Standards

- ASAM standards are already established in many solutions
- Solutions that support ASAM standards may be reused
- Standard interfaces ease integration of existing solutions for research and development
- Standard data formats ease evaluation and lead to earlier results, reference data from internal combustion engines is available for comparison

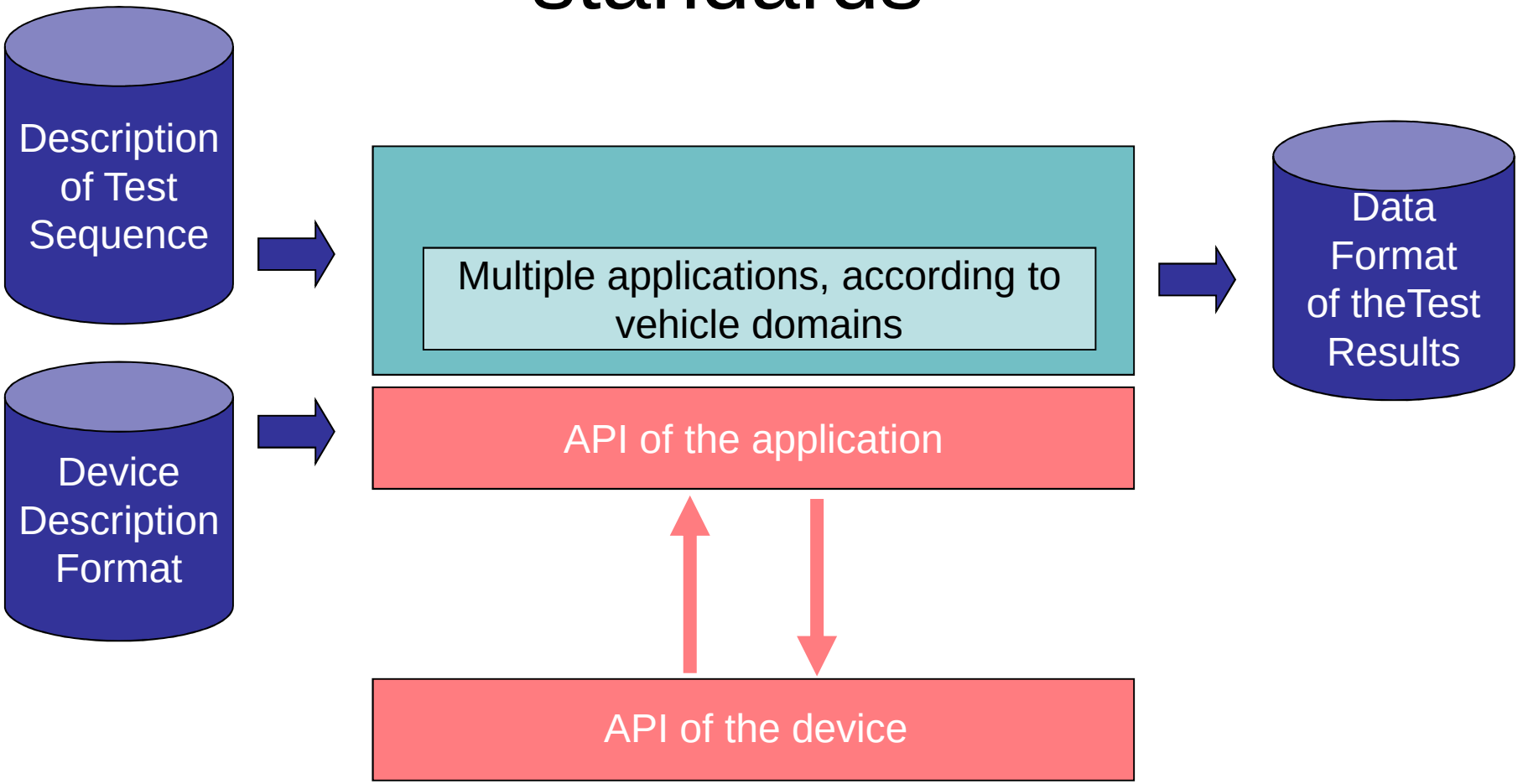
Process Flow and use cases for ASAM Standards



Manufacturer / Supplier Relationship and use cases for ASAM Standards



General structure of ASAM standards



Automotive Electronics (AE)

- MCD1 (Measurement and Calibration **Protocol Family**), e.g. CAN
- MCD2 (**Data Models / Formats** for Measurement, Calibration and Diagnostics), e.g. ODX
- MCD3 and ASAP3 (APIs for diagnostics, measurement and calibration)
- AE HIL (Hardware-In-the-Loop API)
- AE ISSUE (exchange format for change requests and problem reports / issues)
- AE CC (Container Catalog meta data format)
- AE CDF (Calibration Data Format)
- AE FSX (Functional Specification eXchange format)
- AE MBFS (Model Based Function Specification format)
- AE MDX (Meta Data eXchange format)
- AE COMMON CRC (Seed&Key and Checksum Calculation API)
- AAS MSRSYS (ECU Control System Description format)
- AAS MSRDCI (Document Control Information format)
- AAS MSRFMEA (Failure Mode and Effects Analysis)
- AAS MSRMEPRO (Methodology for Engineering PROcess synchronization)

Computer Aided Testing (CAT)

- ACI (Automatic Calibration Interface) **API** for the connection of calibration systems with automation systems
- CEA (Components for Evaluation and Analysis) **API** and data format for evaluation components
- ODS (Open Data Services) **API** for the management of models and formats for data storage and retrieval, description of formats for the data exchange
- GDI (Generic Device Interface) with its device description format, its companion standards for chassis dyno tests, crash tests, diagnostics information, and standards for multi data acquisition systems, as well as its **API** Technology References for Communication Types

General ASAM Standards

– LXF (Layout eXchange Format)
– MDF (binary Measurement Data Format)

ASAM goes ISO

AE MCD-2 D	ISO 22900-1	TC 22 / SC 3 / WG 1
AE MCD-3 D	ISO 22900-3	TC 22 / SC 3 / WG 1
CAT GDI	ISO 20242	TC 184 / SC 5 / WG 6
CAT ODS	ISO PAS 22720	TC 184 / SC 4
CAT ODS VSIM	ISO TS 22240	TC 22 / SC 12 / WG 3
CAT CEA	ISO 16100-3	TC 184 / SC 5 / WG 4
D-PDU API	ISO 22900-2	TC 22 / SC 3 / WG 1
OTX	ISO 13209	TC 22 / SC 3 / WG 1

Open Tasks

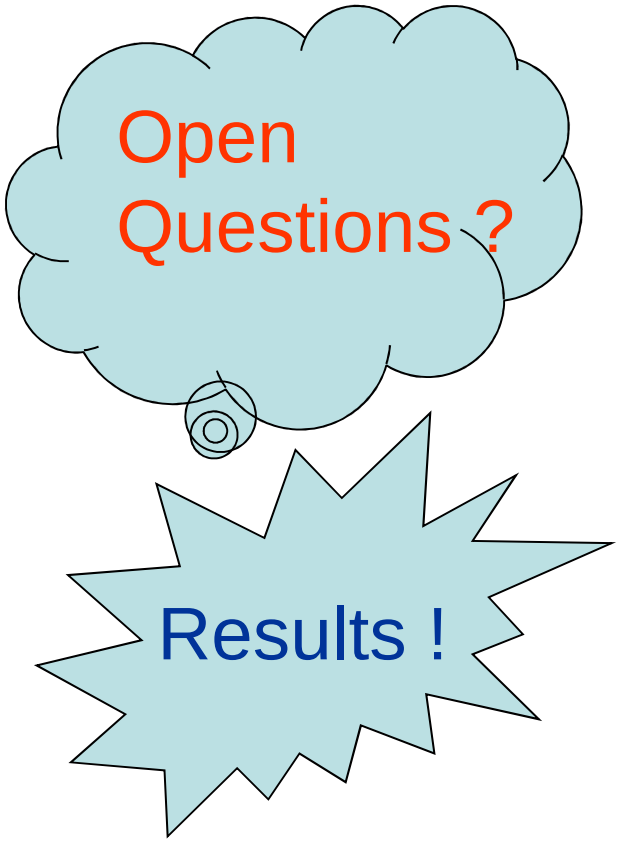
- The battery technology has to be improved
- Suitable power electronics have to be developed
- The electrical propulsion has to be enhanced
- Higher energy efficiency has to be achieved
- Optimized lightweight bodies have to be developed
- Innovative systems for communication and driver assistance have to be invented
- New concepts for energy storage and distribution (battery leasing, infrastructure, smart grid …) have to be installed
- …

The end user has to be won!

ASAM Standards and Electromobility

There is a lot to develop now

Let us start with ASAM standards and reduce the efforts



Thank you very much for your attention, your questions please