AC\textsuperscript{2}DC

Automotive Chassis Development for 5-Days-Car

\textsuperscript{5}DayCar
AC-DC – The Consortium

- France: CEA
- Portugal: INESC Porto
- Spain: CARTIF
- Italy: UNIMORE
- Greece: CERTH
- Hungary: MTA SZTAKI
- Germany:
  - AT Bremen
  - Autoliv
  - BMW
  - Continental
  - ERPC
  - Fraunhofer Institut
  - University of Paderborn
  - VDI/VDE-IT
  - Volkswagen
  - ZF - Friedrichshafen

AT Bremen - Institute for Applied Systems Technology Bremen GmbH
CEA - Commissariat à l’Énergie Atomique
CERTH - Centre for Research and Technology Hellas
ERPC - European Research Programme Consulting
UNIMORE - University of Modena and Reggio Emilia
ACDC – The motivation

• Strengthen the European Car Industry
  – Differentiation → Individuality, Flexibility and Image
  – Reduction of delivery times

• New challenges for the automotive supplier industry
  – Reduced predictability
  – Higher capacity and flexibility demands of the OEM
  – Ability, to operate a supply chain network - a decisive role!
AC→DC – The Vision behind

Development of a vehicle production & supply system to deliver a customized vehicle in 5 days.
AC/DC – The Approach

1. Dynamic Supply Network System for the automotive supplier industry
   \[ \rightarrow \text{3 H’s:} \]
   - Highly reactive
   - Highly reliable
   - Highly flexible

2. Customized-To-Order Principle
AC\^\textcircled{DC} – The Approach

1. Dynamic Supply Network System for the Automotive Supplier industry

- Decentralized supply chain planning & execution
- Efficient planning process based on feedback loops
- Higher responsibility at the 1st tier supplier
- Reduction of costs
- Reduction of supply chain network control complexity → Simplification & Standardization
- Close collaboration
- Supply chain optimum instead of local optimum
ACDC – The Approach

2. Customize-to-order Principle

- Consequent modularization
- Late customization via Software flashing

Customer anonymous production

Customized mechatronic component
ACDC – The Project Structure

Project Co-ordination - Continental

WP 0000
ERPC
Project Governance

WP 1000
ZF
Flexible Chassis Design & Configuration

Task 1100
Advanced Chassis Mechatronics
ZF

Task 1200
Advanced Software Concepts
Conti

Task 1300
5-Days Technology Validation
ZF

WP 2000
Conti
Dynamic Supply Network Management

Task 2100
Dynamic Supply Loops
Conti

Prediction & Planning

Task 2200
Collaborative Demand Prediction
Mandator

Task 2300
Planning Consistency
UPB

Process Execution

Task 2400
Real-Time Event Handling
Conti

Production & Testing

Task 2500
Modular Production Technology Processes
Conti

Task 2600
Distributed Develop. & Testing
ATB

Task 0100
Technical Concept & Specifications
ERPC

Task 0200
Operational Co-ordination
ERPC

Task 0300
Financial Management
VDIVDE-IT

Task 0400
Public Interface
FhG

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WP1000 – The USE CASE

Mechatronic rear axle module

Signal provision

Vehicle electric system
WP2000 – The USE CASE
AC\textsuperscript{A}DC – Expected Final Results

1. Code of practice
   - Documentation for implementation of AC\textsuperscript{A}DC methodologies in European Automotive Supply Networks
   - Structure based on a Tool-box principle
     \(\Rightarrow\) Selection and implementation of those methods which are needed at an individual company

2. Integrated validation
   - Proof-of-concept of Dynamic Supply Loops processes with validated rear axle module
... Questions?
BACK UP
ACDC - Implementation Initiative

Rear axle as a module

MECUs Measures Vehicle electric system
Sensor TV-Gear
Active stabilizer MR-dampers

Needs: Task 2200
Planning, General: Task 2100
Consistency: Task 2300
Crisis Management: Task 2400
Modularity: Task 2500
Development, Testing: Task 2600

OEM
WP 2000 – The USE CASE

1. Electronic Control Unit (ECU)
2. Hydraulic valve unit & valves
3. Pump motor
4. Active wheel speed sensors