

- 1 Tasks and Requirements**
- 2 Model-based Solutions**
- 3 Applications 1: On-board Diagnosis**
- 4 Applications 2: FMEA**
- 5 Applications 3: Workshop Diagnosis**
- 6 Applications 4: Authoring Systems**
- 7 Research Topics**

# Genesis: Authoring Systems for Diagnosis Manuals

## Diagnosis Manuals

- Information and guidance for diagnosis/testing/repair in the workshop
- Core: test plans, starting from
  - customer complaints
  - trouble codes
- Text-based authoring system
  - DB with 100 000 text building blocks
- Translation: more than 20 languages
- Distributed on CD-ROM
  - Future: Internet
- Variant problem
  - different manufacturers
  - different models/variations

### Coolant temperature sensor

Trouble code: 020A

Sensored value: coolant temperature

\* Ignition off, plug open

\* measure resistance at sensor

Nominal value 15..30°C:

1,5..3,3 kOhm

Nominal value ca. 50°C:

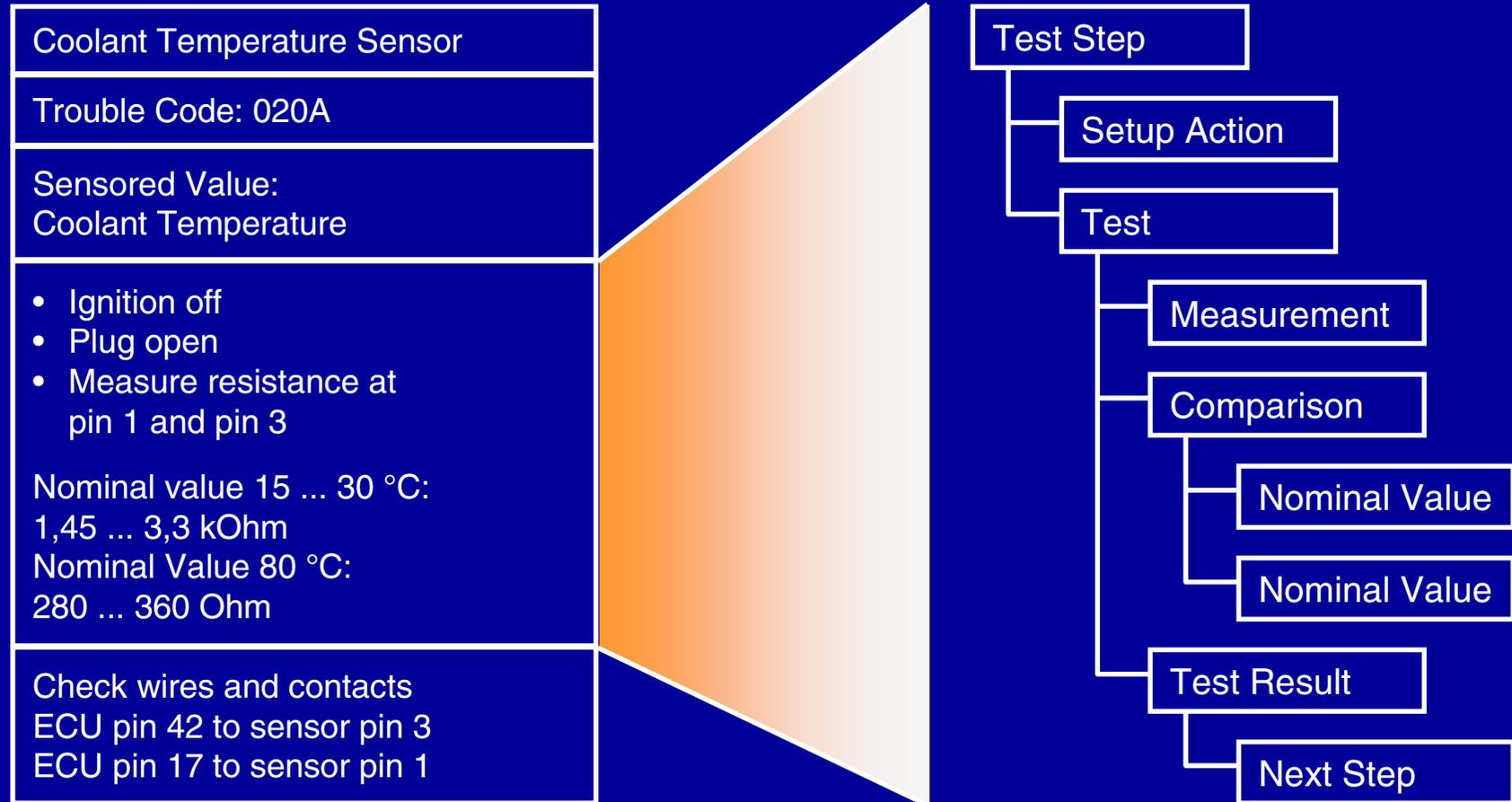
180..360 Ohm

Check wires and contacts

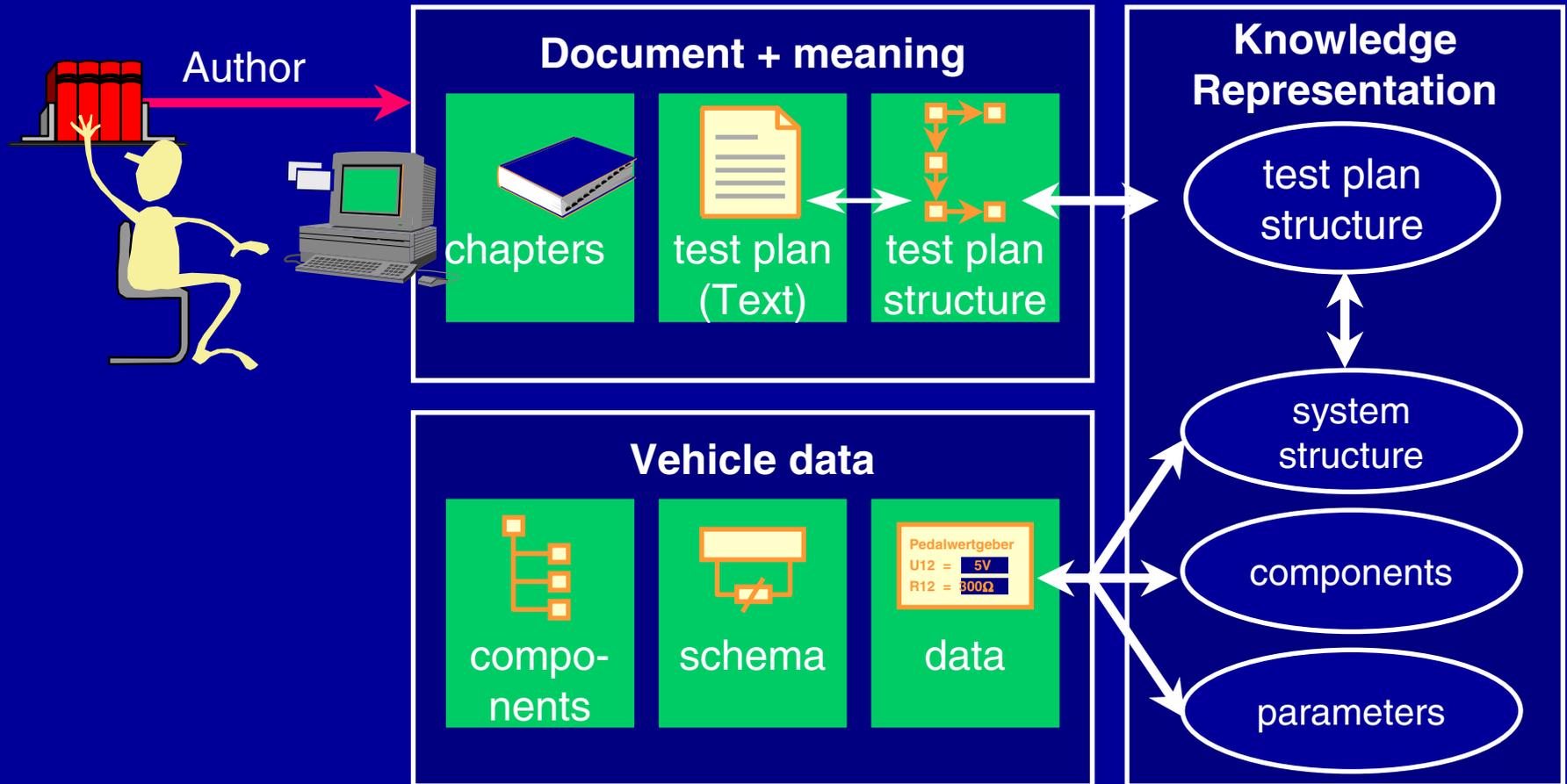
ECU pin 42 to sensor pin 3

ECU pin 17 to sensor pin 1

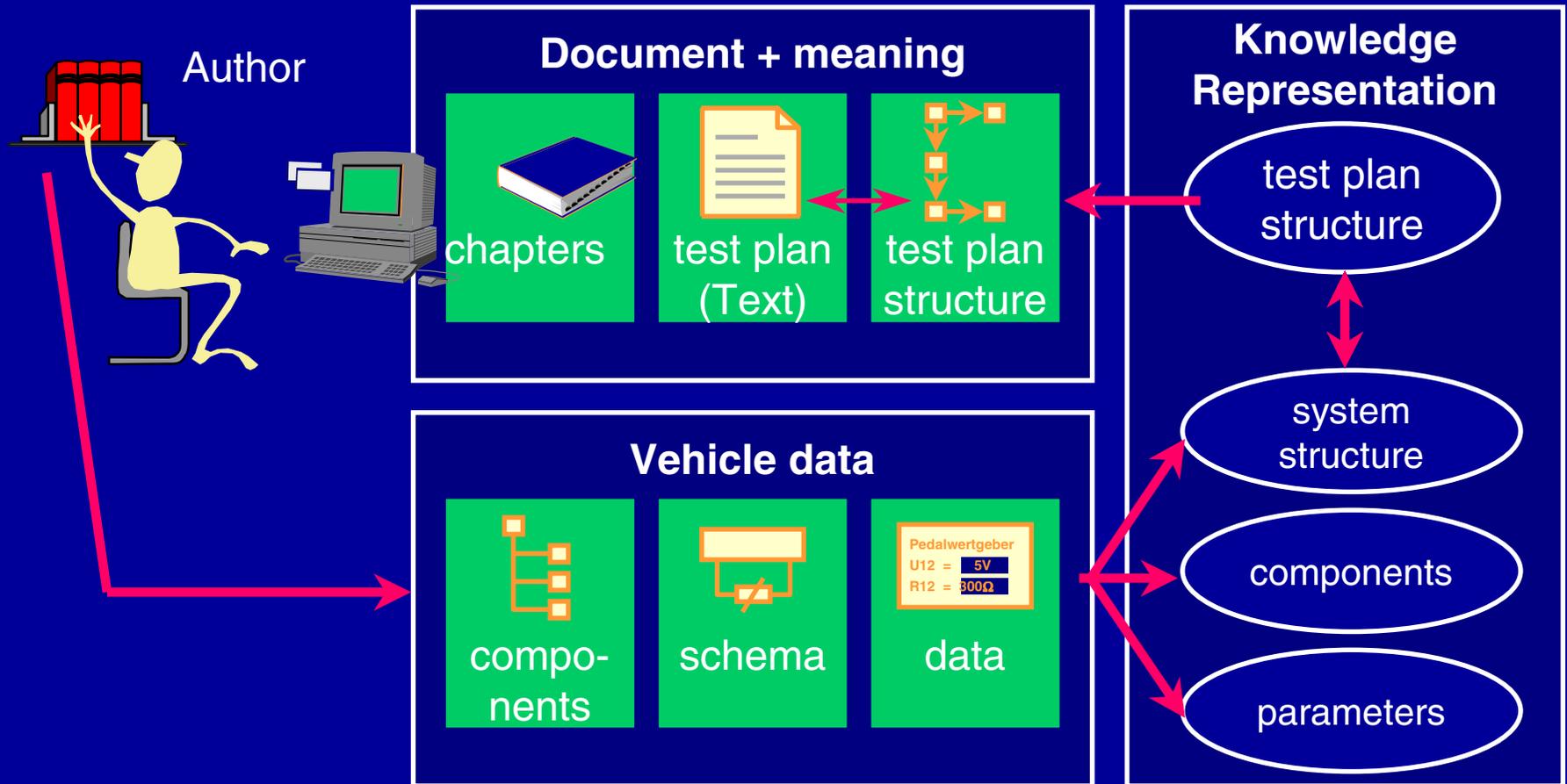
# Representation of Diagnostic Manuals



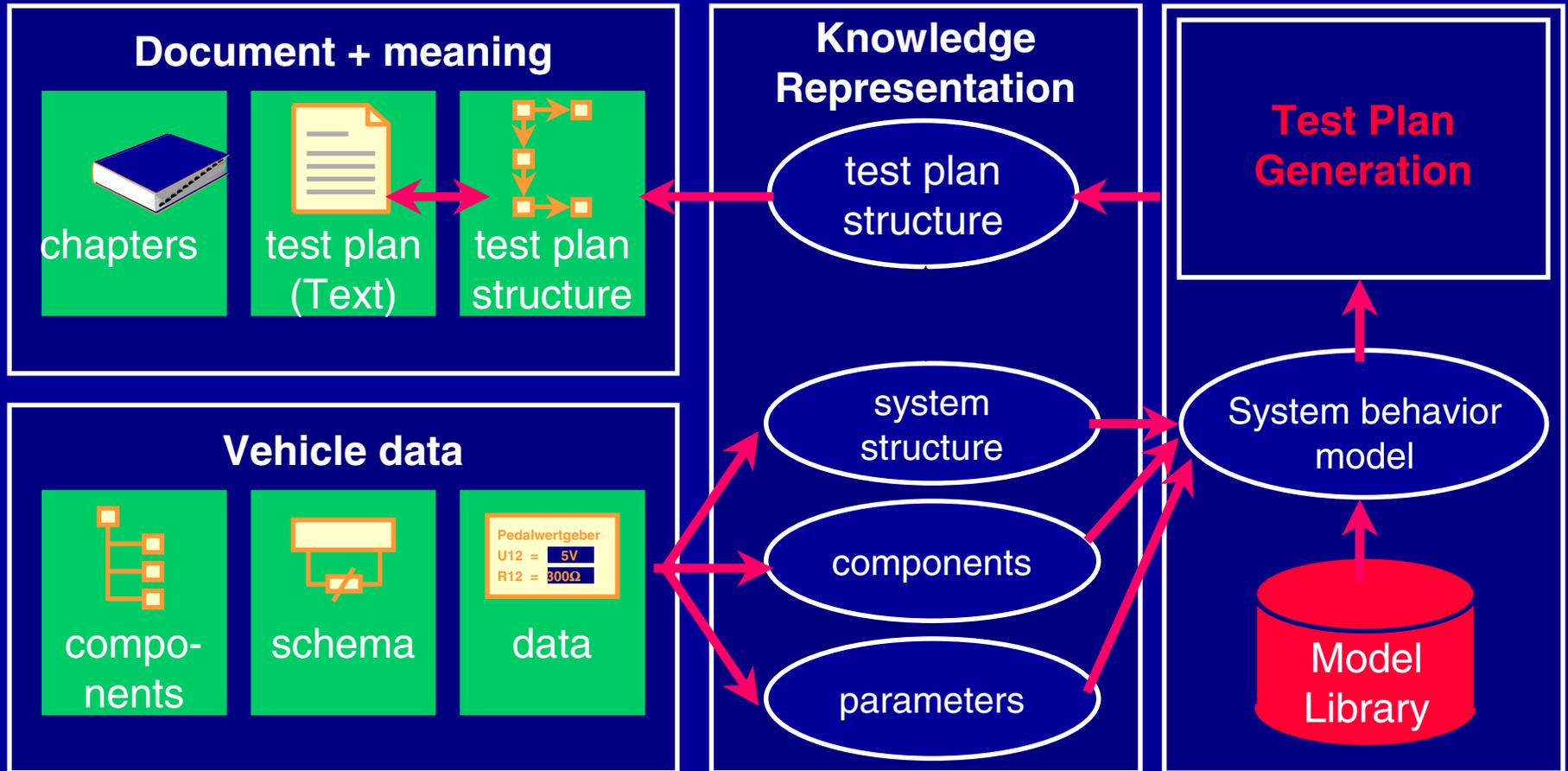
# Documents and Knowledge Representation



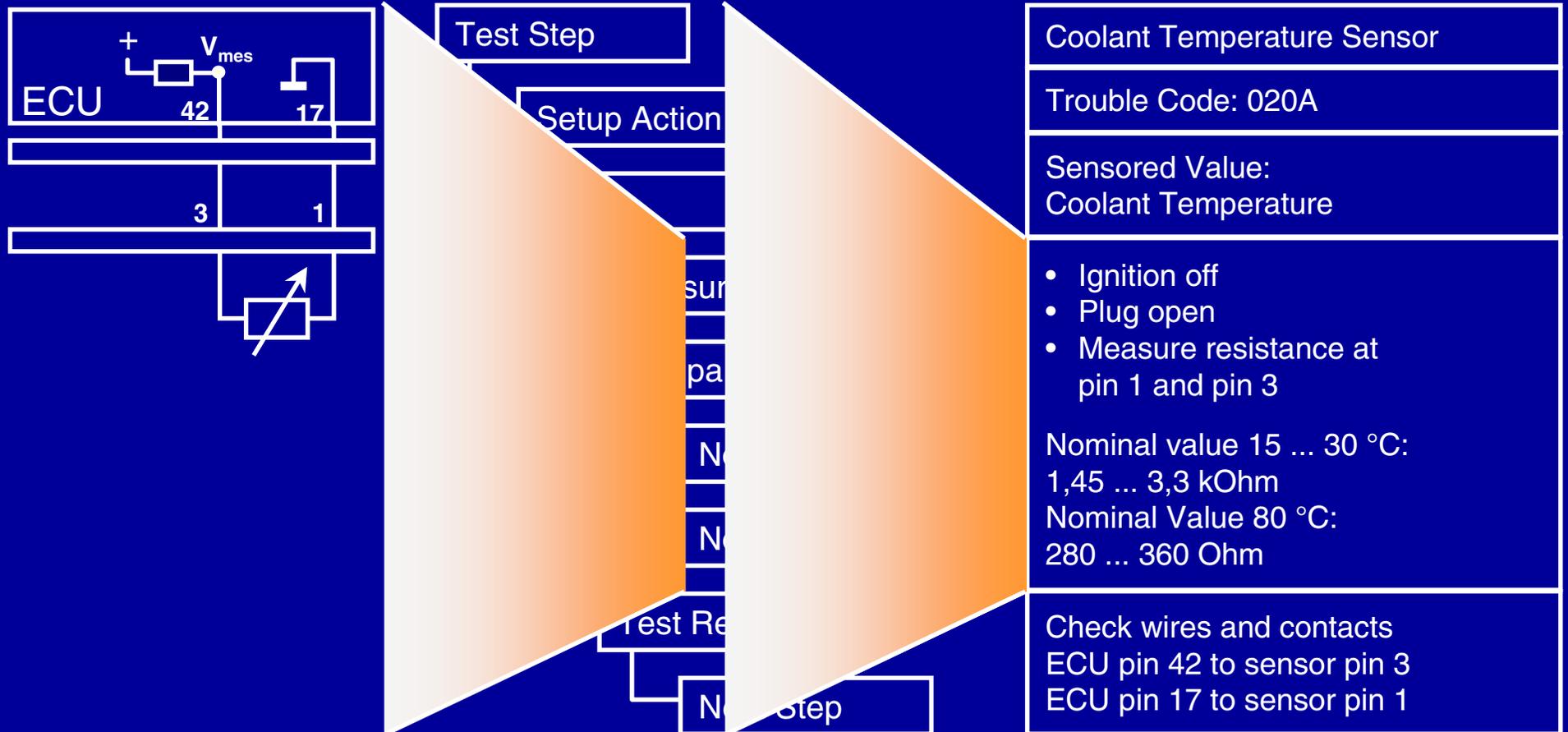
# A Change in the Authoring Process



# Automatic Generation of Test Plans



# Generation of Diagnostic Manuals



# Benefits

## Knowledge Representation:

- Decreased number of textblocks
- Increased reuse of textblocks
- Increased uniformity
- Faster and coherent adaptation
- Decreased translation costs
- J2008 support
- Retrieval support
- Import of design data

## Model-based Generation:

- Solution to variant problem
- Faster production
- Complete and correct test plans

# Model-based Systems

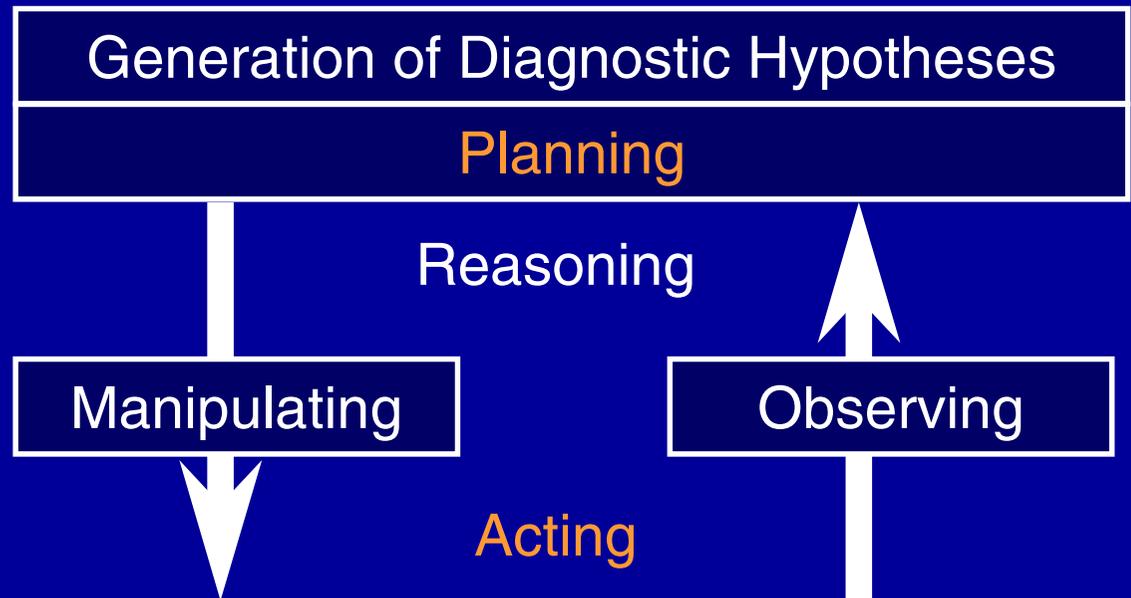
- An alternative, **efficient** way to create diagnoses

- Efficiency: **work process**
  - Tools for the developer of on-board diagnostics, diagnosis manuals, FME-Analyses, ...
  - Re-use of models and software components

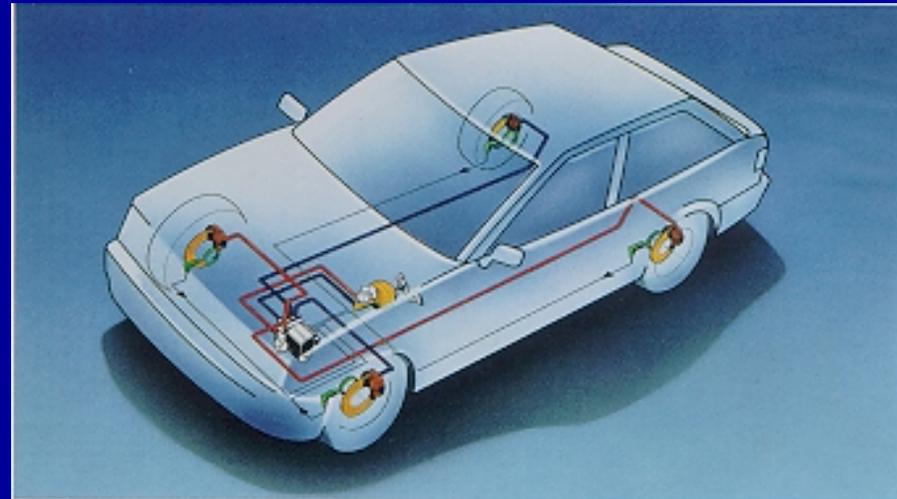
- Efficiency: **application systems**
  - High-performance diagnosis algorithms
  - qualitative, compiled models

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# Diagnosis as a Work Process



- Actions
- People
- Equipment
- Costs



# Automated Modeling

- Generate a (qualitative) model that is appropriate for a particular device and task

