



Automobiles and  
Light Commercial Vehicles



## Software Process Improvement

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# Agenda



- **Software Factory: goals**
- **Software Factory: main concepts**
- **Software Factory: main process**
- **Software Factory: applications**
- **Software Factory: tools**
- **Process Improvement: scope**
- **Process Improvement: SPICE process mapping**
- **Process Improvement: plan**



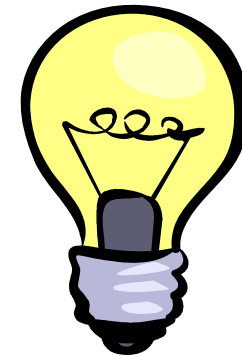
# Software Factory: GOALS



- Develop Application Software Modules
- IP / Strategies protection
- SW module reuse (in all vehicle project)



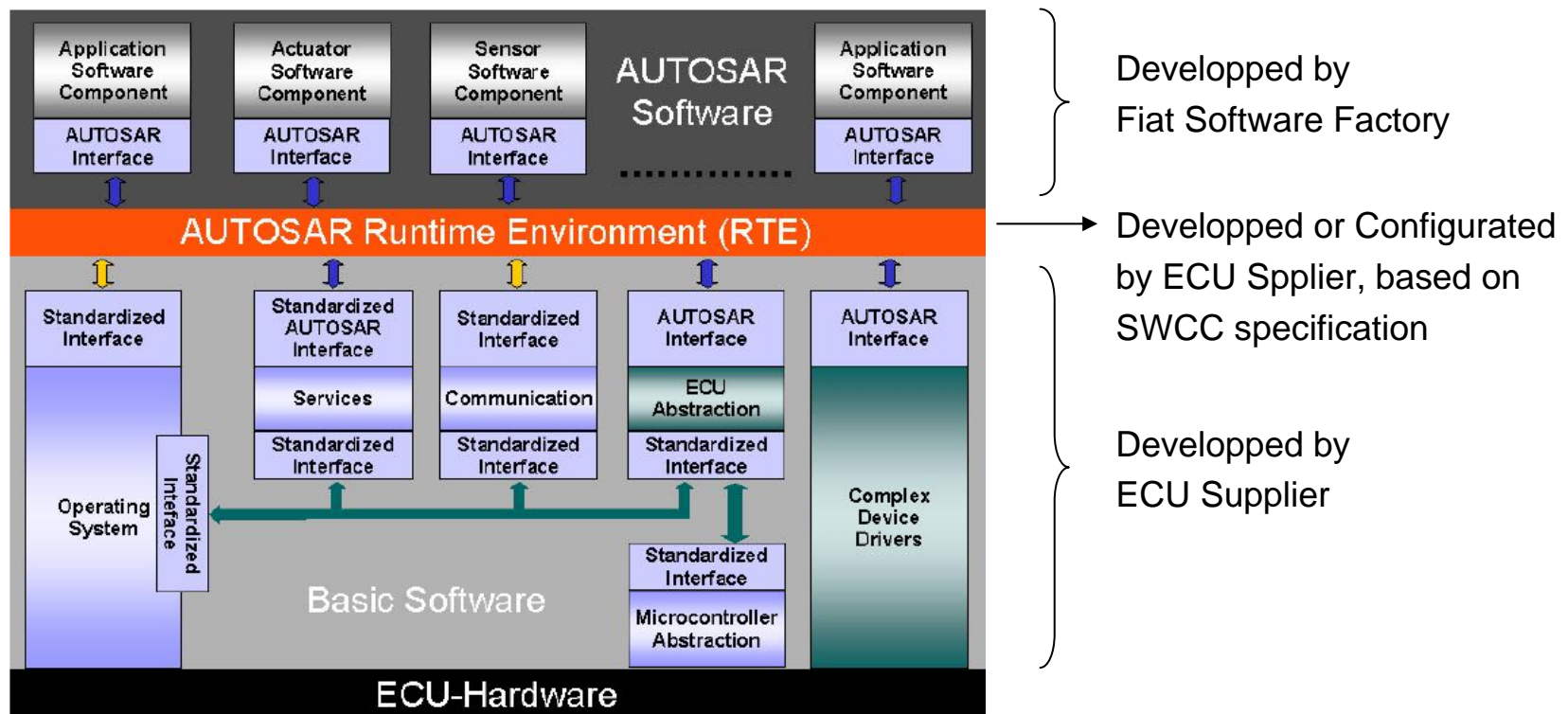
- Software Factory foundation
- Domain:
  - ▶ Body Electronics
  - ▶ Infotainment
  - ▶ Climate Control
  - ▶ Specific algorithms (Chassy, Powertrain, etc)



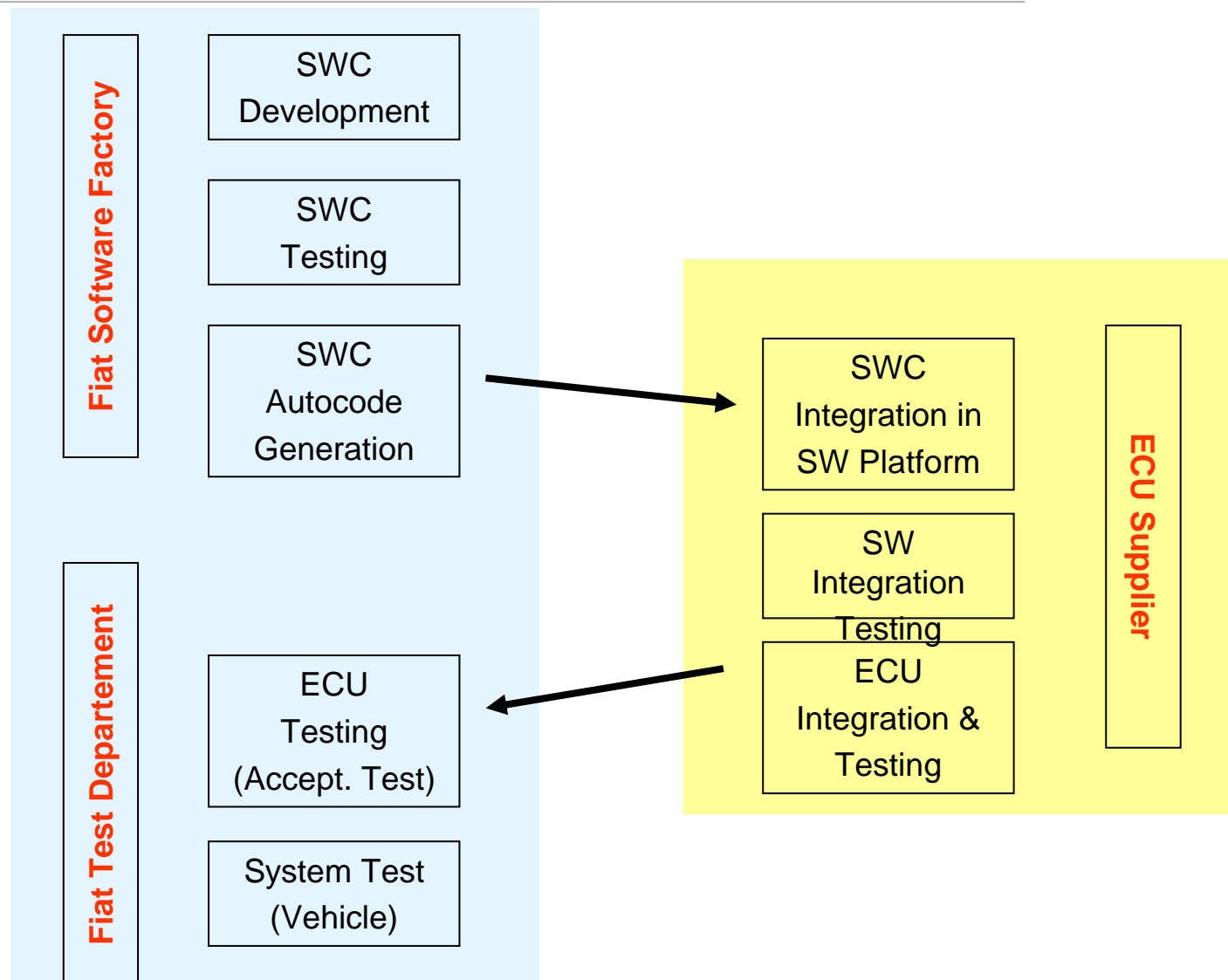
# Software Factory: MAIN CONCEPTS



- Autosar: Software Architecture & Process Development
- Model Based Design approach
- Application Software Component development



# Software Factory: MAIN PROCESS



# Software Factory: APPLICATIONS



- Software Factory activities started in March 2006
- First SW components released: in June 2006
- First SW integration: July 2006
- First application: Fiat 500
  
- At the moment (October 2007):
  - ▶ 8 SW Components
  - ▶ 4 Vehicle applications
  - ▶ 3 Brands
  - ▶ Domain: Body Computer
  
- Planned (within 2008):
  - ▶ 10 other SWCs
  - ▶ All Vehicles
  - ▶ All Brands
  - ▶ Domain: Body Computer





# Software Factory: TOOLS



- Requirement management:
  - ▶ DOORS
- Model Based Development:
  - ▶ Matlab
  - ▶ Simulink
  - ▶ Stateflow
  - ▶ Verification & Validation Toolbox
- Autocode generation
  - ▶ dSPACE TargetLink
  - ▶ dSPACE Autosar Blockset
- Testing
  - ▶ Custom Tools
- Configuration Management
  - ▶ Under investigation



# Process Improvement: SCOPE



Process	Title
ENG.1	Requirements elicitation
ENG.4	Software requirements analysis
ENG.5	Software design
ENG.6	Software construction
ENG.8	Software testing
SUP.1	Quality assurance
SUP.4	Joint Review
SUP.8	Configuration management
SUP.9	Problem Resolution management
SUP.10	Change Request Management
MAN.3	Project Management
MAN.5	Risk Management
REU.2	Reuse Program Management
SPL.2	Product Release

## Reasons:

- These processes are directly related to activities managed by Fiat Software Factory
- These processes are on the basis of key-activities
- These processes are aligned to AutomotiveSPICE and Fiat Scope requirements
- The processes related to “system” are not present because it is not defined / managed by Fiat Software Factory

## Goals:

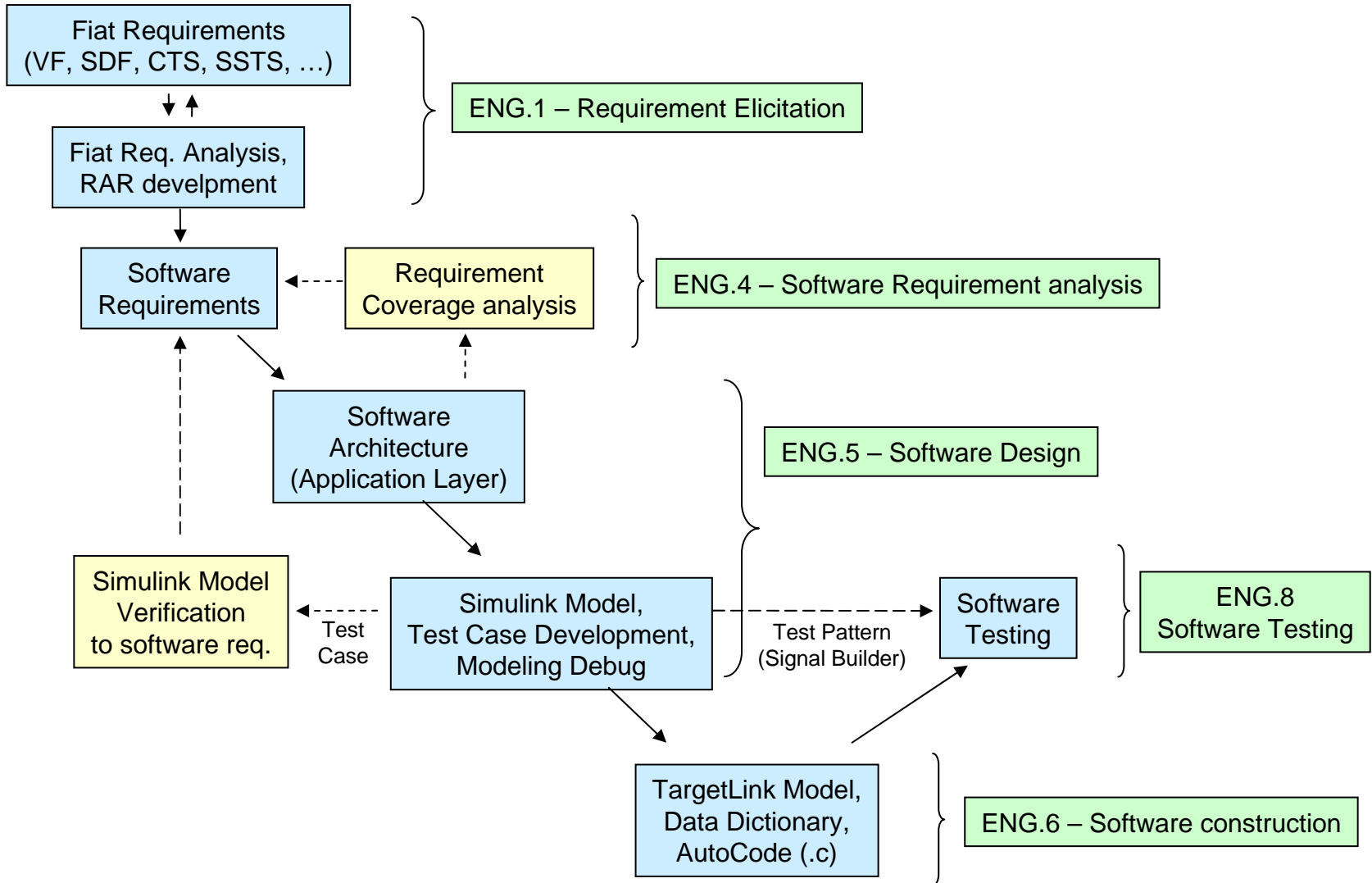
- Level Expected (for all processes) within 2008: Fiat Scope Requirements (the other processes at level 2)
- Level Expected (for all processes) within 2009: 3



# Process Improvement: SPICE process mapping



(ENG Processes only)



- February 2007:
  - ▶ Start Improvement plan
- February – March 2007:
  - ▶ Process Scope definition
- March – June 2007:
  - ▶ Gap analysis
  - ▶ Improvement area determination
  - ▶ Action plan definition
- July – October 2007:
  - ▶ Document Types definition
  - ▶ Document Templates definition
  - ▶ Traceability methods implementation
  - ▶ Processes and roles description



## Process Improvement: Plan /02



- October 2007 – April 2008:
  - ▶ Processes Implementation (real application on software module development) – Step 1.
  - ▶ Tuning of processes, roles, documents, etc.
- May 2008:
  - ▶ Internal Assessment
- April – December 2008:
  - ▶ Processes Implementation (real application on software module development) – Step 2.
  - ▶ Tuning of processes, roles, documents, etc.
- November / December 2008:
  - ▶ Third Party Assessment
  - ▶ Goal: Fiat Scope Requirements (the other processes at level 2)
- November / December 2009:
  - ▶ Third Party Assessment
  - ▶ Goal: Level 3 of all processes in the scope



- **SW Requirement Specification (SRS) definition**

- ▶ Contents
- ▶ Relationship with other work products / documents

- **Traceability:**

- ▶ Methods and tools
- ▶ Analysis Criteria

- **Document Template to manage:**

- ▶ SW Development Plan
- ▶ Quality Plan
- ▶ Joint Review
- ▶ SW-VDD, SW-ISSUE, ...

- **Change Management:**

- ▶ Integration with Fiat process
- ▶ Tools & Methods

- **Configuration Management:**

- ▶ Methods, Strategy and Tools
- ▶ Plan



**FIAT**  
**GROUP**

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# Thank you !

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11 October 2007