



FIAT CHRYSLER AUTOMOBILES

Electronics Software CAPability Evaluation

Improve the process to improve the product

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Jeep



- **Software Engineering** is the discipline related to:
 - process,
 - methodology,
 - activityto develop software systems.
- The goals are related to the evolution of software development as far as concern both technology and methodology (e.g. SW lifecycle).

Which are FCA requirements?



- ## Which are FCA requirements?



- The FCA answers to this request is adopting international standards

ASPICE/SPICE and **CMMI**,

defined to :

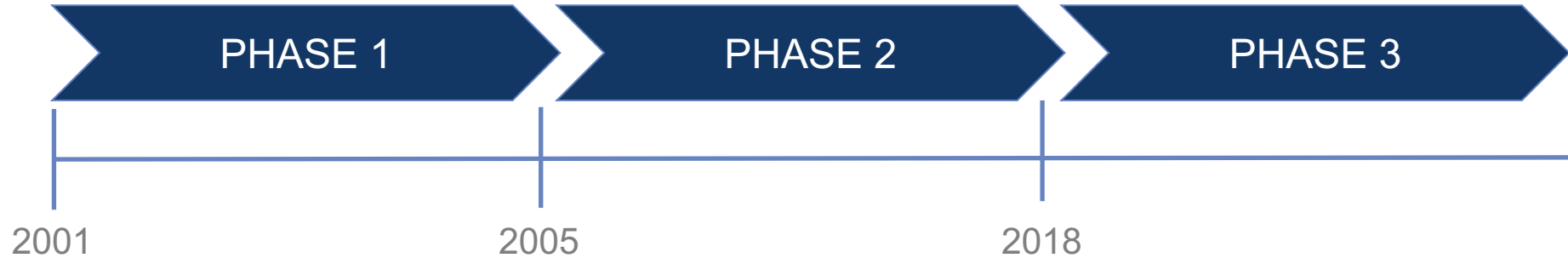
- Guide software developers to define a good development process
- Help in evaluating the software developer capabilities.



- The **Electronic Software CAPability Evaluation** FCA standard governs the evaluation of the process capability and project performance of Suppliers for software-intensive systems.



Electronic SW CAPability Evaluation



- Evaluate the status of the main FCA Suppliers.
- Around 15 assessments were organized and paid by FCA.
- Customize the standard to FCA need.
- The Suppliers had to be compliant to the defined standard (FCA scope, FCA expected level).
- The Supplier had to plan for improvement (target level).
- The certification was a gate to be acceptable as FCA Supplier.



Change driving factors

- **New revision** of the international standards.
- Review the **scope**.
- Harmonize the **certification** request with the activities during projects development.
- Better **monitoring** of the Suppliers.
- Use the **past experience**.



The new strategy



- The SRL is the level of risk associated to a Supplier's business unit.
- The Supplier governance activities are adapted using the SRL



**Supplier Risk Level rating index
(SRL)**



Supplier Action



FCA Monitoring

Supplier Risk Level (SRL)

- The **SRL** is determined combining:
 - the **Process Capability/Maturity Evaluation** of the Supplier (**PCMR**) and
 - the data from the FCA **Supplier's Software Process Assessment (SSPA)**.

$$\text{SRL} = f(\text{PCRM}, \text{SSPA})$$

- SRL index is evaluated according to a 4-values scale.

A

Low Risk

B

Medium Risk

C

High Risk

D

Not eligible

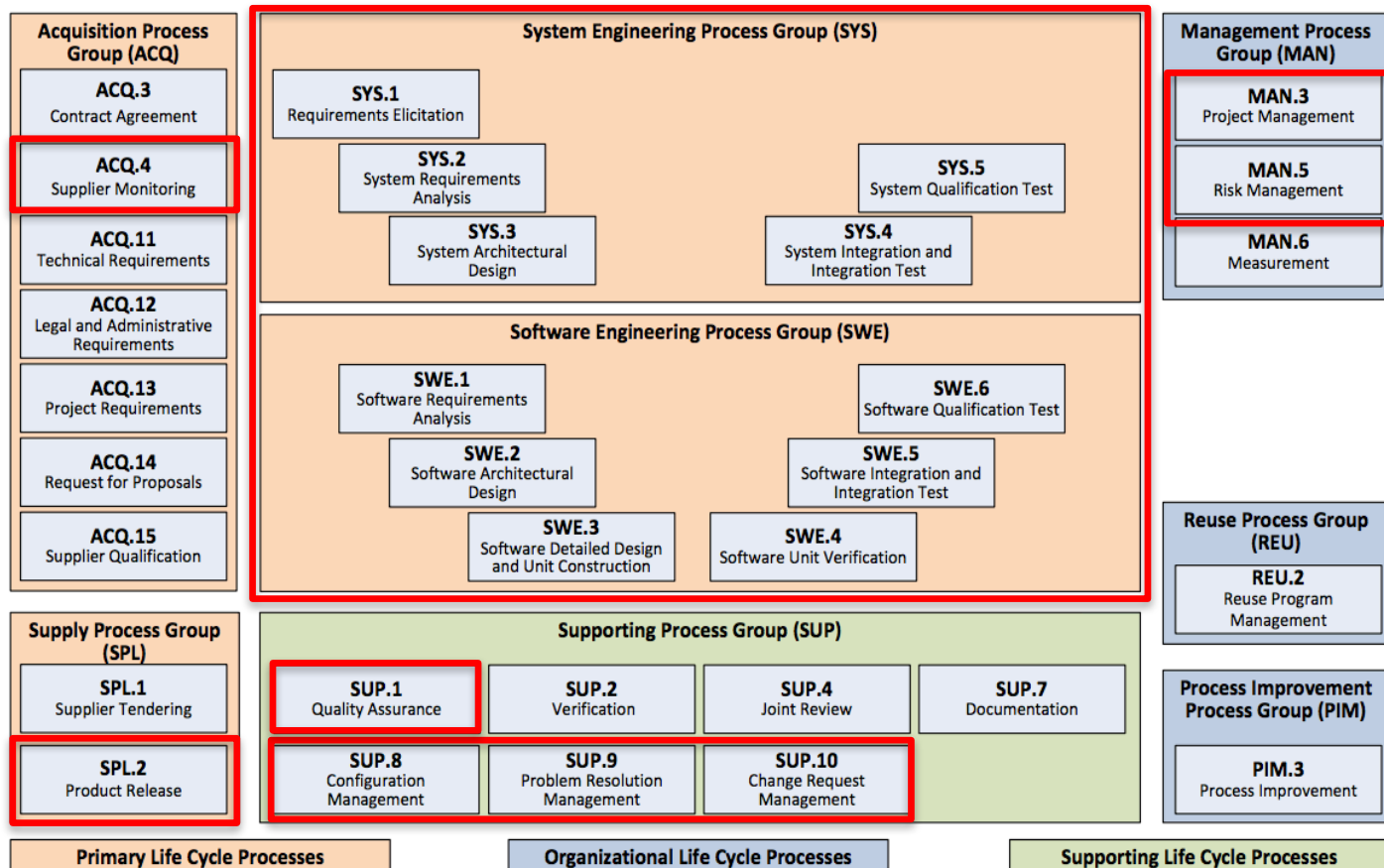
Process Capability/Maturity Evaluation (PCMR)

- The **PCMR** is based on ASPICE 3.1
 - FCA specific **scope**
 - FCA **expected capability level** for every process
- The E.S.CAP.E. standard includes CMMI (CMMI-DEV - ver. 2.0) and SPICE (ISO 15504) in case a Supplier is already certified according to those standards.
- The expected capability level for every process is 2 (managed process).



FCA scope
SYS.1: Requirements Elicitation
SYS.2: System Requirements Analysis
SYS.3: System Architectural Design
SYS.4: System integration and integration test
SYS.5: System Qualification Test
SWE.1: Software requirements analysis
SWE.2: Software Architectural Design
SWE.3: Software Detailed Design and Unit Construction
SWE.4: Software Unit Verification
SWE.5: Software integration and integration test
SWE.6: Software Qualification Test
MAN.3: Project Management
MAN.5: Risk Management
SUP.1 : Quality assurance
SUP.8: Configuration Management
SUP.9: Problem resolution management
SUP.10: Change request management
ACQ.4: Supplier Monitoring
SPL.2: Product Release

Process Capability/Maturity Evaluation



Supplier's Software Process Assessment - SSPA

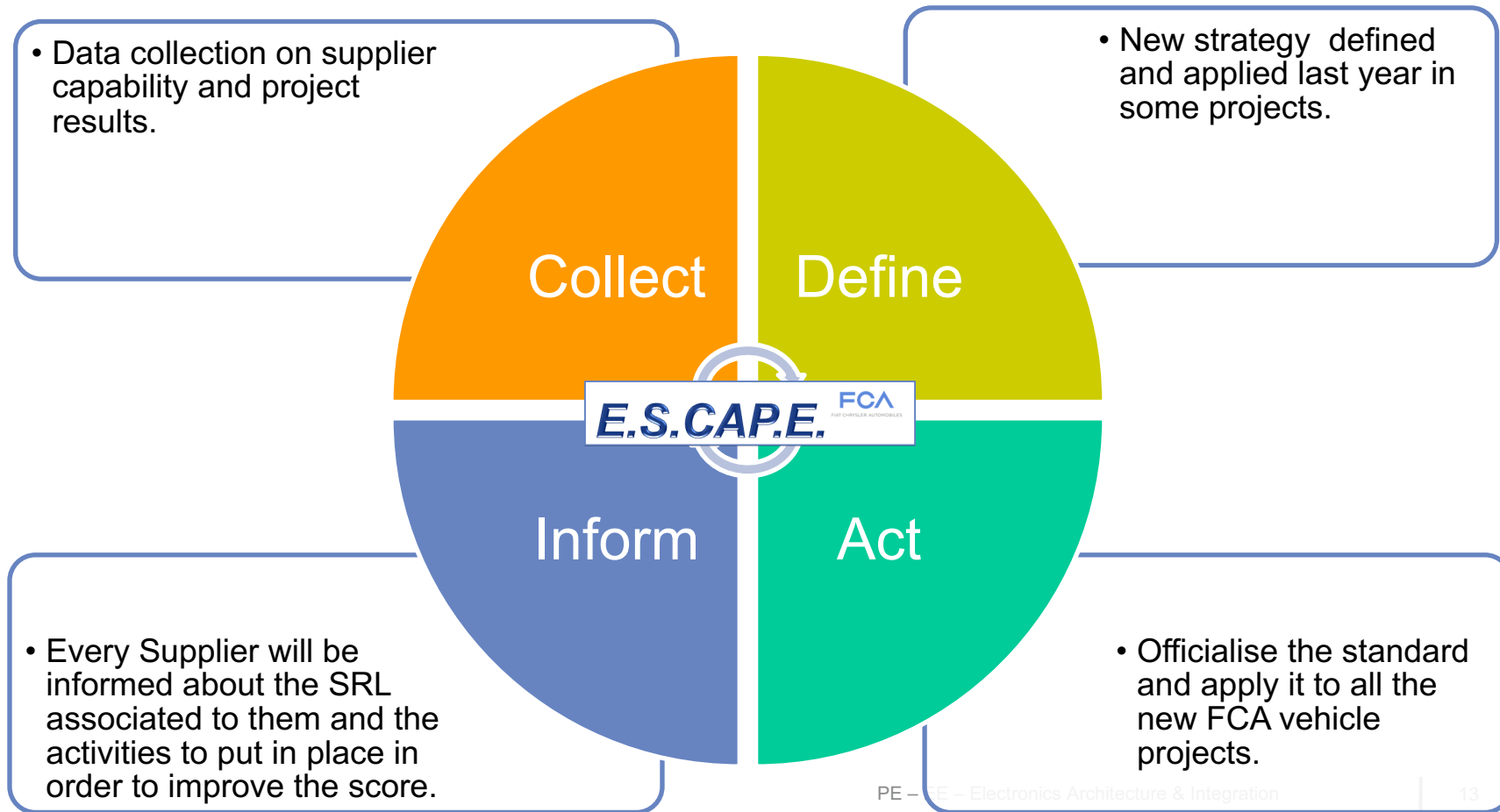
- The **SSPA** is based on **technical and managerial capability** of the Supplier on the basis of data from past projects for FCA
- Data are acquired during tendering phase and project development phase using check list, design reviews or on-site lightweight assessments.
- The data are:
 - Management capability (project management and quality assurance)
 - Technical capability (development and testing capability)
 - Reuse capability



$$\text{SRL} = f(\text{PCRM}, \text{SSPA})$$

		SRL			
PCMR	A	D	B	A	A
	B	D	C	B	A
	C	D	C	B	B
	D	D	D	C	C
		D	C	B	A
		SSPA			

- The SRL is used during tendering phase to select a Supplier (better compromise between quality and costs) .
- The evaluation is exposed to the project team that can evaluate if risk associated to a Supplier is acceptable or not.
- The “D” level is equivalent to a technical roadblock.



Questions & Answers



Backup