

ISO 15504 (SPiCE) Assessment

Employee Motivation and Information using SPiCE

The Road to Software Process Improvement

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❖ Processes and their nature

❖ Process Improvement

- ✧ The formal and technical Aspects
- ✧ Build your Castle with SYNSPiCE
- ✧ Assessment Example
- ✧ People Aspects: How to navigate around Pitfalls.

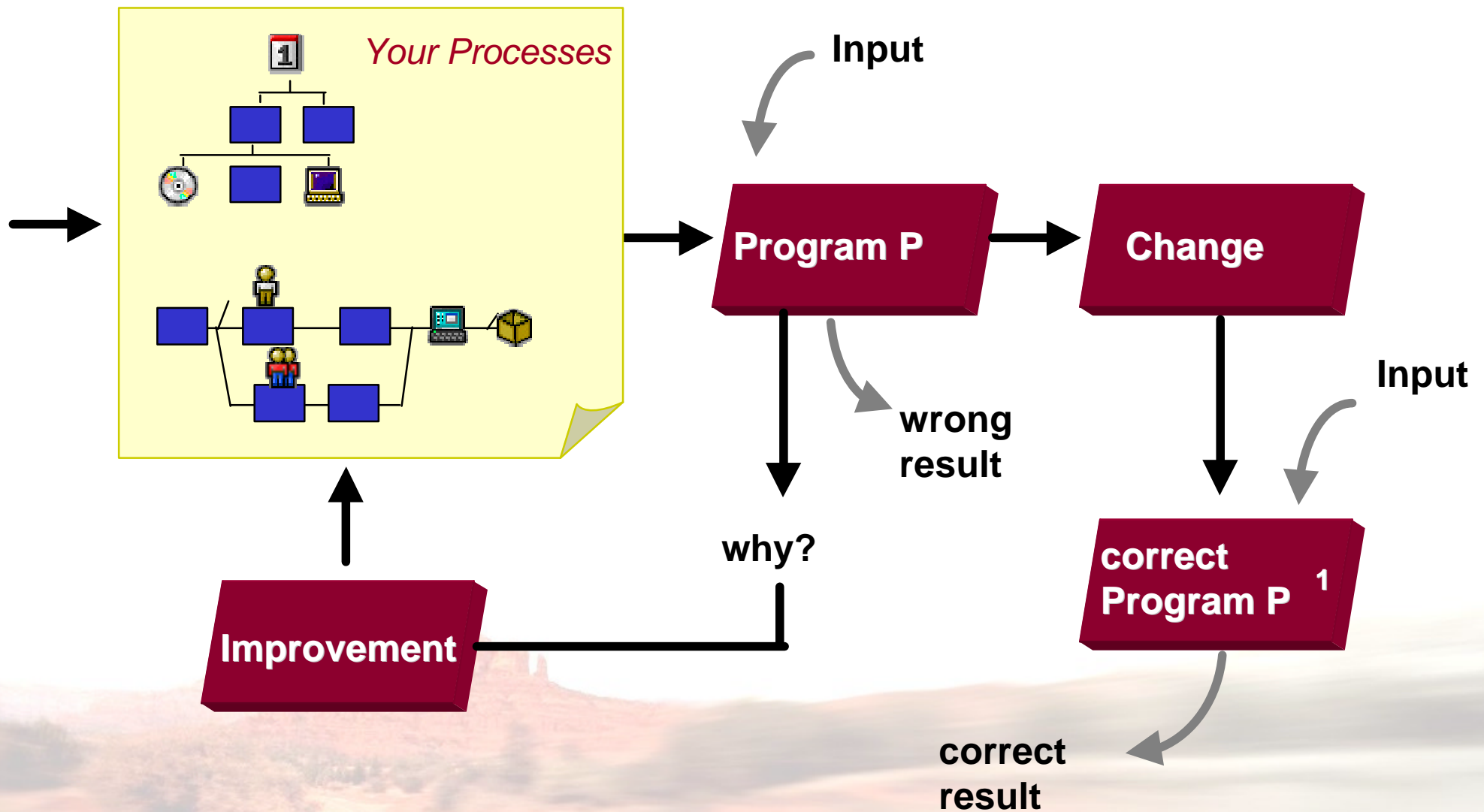
Three Levels of Process Awareness

- ❖ There are organisations, where employees know, that they are following a certain *process*. What they are doing now is just the physical instance of an abstract process (a pattern). They are aware *of processes*.
- ❖ In other organisations employees have lots to do. They have a lot of *tasks* waiting to be done. Maybe, they do it often the same way, but they don't know, that there could be a process behind...
- ❖ The third type of organisation is even not aware of tasks. If you look at them and see, what they are doing, you best can describe it as software producing *behavior*. You don't know how it happened, but at the end, software is there...

Are you ready for processes?

- ❖ Software development is complex
- ❖ There are lots of possibilities that you do something wrong and only a small chance to do it right
- ❖ If you are following certain procedures, rules, guidelines, **processes**, then...
 - ✧ You can do similar things in a similar way
 - ✧ You already know what you will be doing
 - ✧ You can learn from the past
 - ✧ Software development will become **deterministic**
 - ✧ Software development can be **controlled**

If a Process delivers wrong results ...



The Process should be corrected, not only the product.

The First Step

Determine your current position:

**Before you start,
you need to know, where you are.**

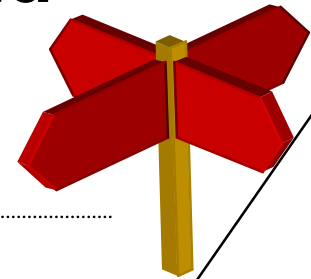


***If you don't know, where you are,
a map won't help.***

Determine your path:

Once you know, where you are, you
also need to know where to go to and
how to get there.

*If you don't know where you are going,
any road will do.*



Assessment Benefits

The first steps:

- **Determine your current position**
- ➡ **Define the goals**
- ➡ **Derive actions to achieve the goals**

An appropriate assessment method can help you to perform all those steps.

A SYNSPiCE Assessment is oriented towards the organisation's business goals.

What is ISO/IEC TR 15504?

- ❖ **International standard for assessing software processes**
 - ✧ Developed in parallel with other software engineering standards (ex. ISO 12207)
- ❖ **Purpose:**
 - ✧ Continuous process improvement
 - ✧ Capability determination
- ❖ **Scope:**
 - ✧ Comprehensive
 - Processes include acquisition, supply, development, operation, maintenance and support
 - ✧ Modular
 - Can select which processes to assess
 - Each process is assessed on a scale of capability

ISO/IEC TR 15504 is the Result of the SPiCE-Project

SPiCE : The Assessment Model

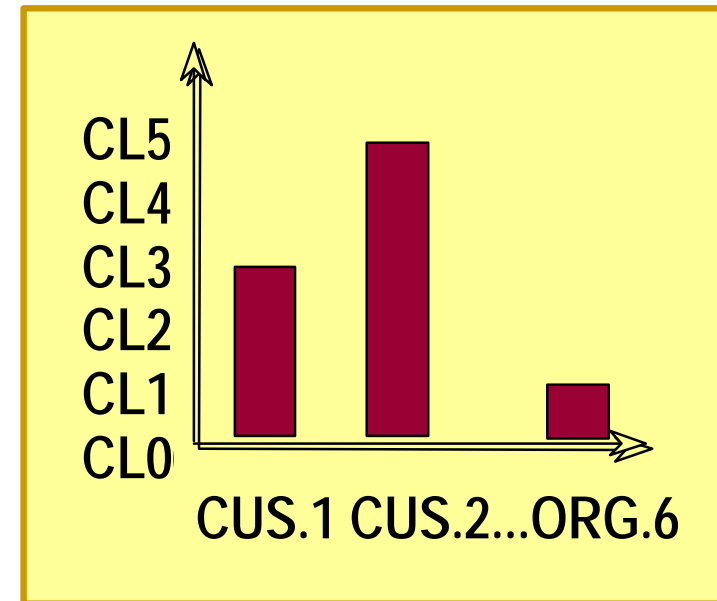
❖ Two-dimensional model for processes and process capability

❖ Process Dimension

- Process Categories
- Processes (P1, ..., Pn)

❖ Capability Dimension

- Capability Levels (CL1, ..., CL5)
- Process Capability Attributes



❖ Each process receives a capability level rating

SPICE: Processes

Customer-Supplier		
CUS.1	Acquisition	(3)
CUS.1.1	Acquisition Preparation	(4)
CUS.1.2	Supplier Selection	(3)
CUS.1.3	Supplier Monitoring	(4)
CUS.1.4	Customer Acceptance	(2)
CUS.2	Supply	(5)
CUS.3	Requirements Elicitation	(6)
CUS.4	Operation	(3)
CUS.4.1	Operational Use	(8)
CUS.4.2	Customer Support	(5)

Engineering		
ENG.1	Development	(4)
ENG.1.1	System Requirements Analysis & Design	(7)
ENG.1.2	Software Requirements Analysis	(6)
ENG.1.3	Software Design	(5)
ENG.1.4	Software Construction	(4)
ENG.1.5	Software Integration	(6)
ENG.1.6	Software Testing	(4)
ENG.1.7	System Integration & Testing	(8)
ENG.2	System & Software Maintenance	(7)

Support

SUP.1	Documentation	(7)
SUP.2	Configuration Management	(9)
SUP.3	Quality Assurance	(7)
SUP.4	Verification	(4)
SUP.5	Validation	(4)
SUP.6	Joint Reviews	(8)
SUP.7	Audit	(8)
SUP.8	Problem Resolution	(6)

Management

MAN.1	Management	(8)
MAN.2	Project Management	(12)
MAN.3	Quality Management	(6)
MAN.4	Risk Management	(8)

Organisation

ORG.1	Organisational Alignment	(5)
ORG.2	Improvement	(4)
ORG.2.1	Process Establishment	(9)
ORG.2.2	Process Assessment	(10)
ORG.2.3	Process Improvement	(9)
ORG.3	Human Resource Management	(10)
ORG.4	Infrastructure	(7)
ORG.5	Measurement	(7)
ORG.6	Reuse	(7)

Total Number of Base Practices (249)



ENG.1.4

Software Construction

Purpose

Produce executable software units and verify that they properly reflect the software design

purpose

Outcomes

- verification criteria will be defined for all software units against their requirements;
- software units defined by the design will be produced;
- consistency will be established between software requirements and design and software components;
- verification of the software units against the design will be accomplished.

outcomes

note

NOTE Part of this process is similar to the process *Verification process* (SUP.4).

Capability Levels, Process Attributes

Optimising

Quantitative measures used for continuous improvement process

Level 5 Optimising

PA.5.1 Process Change
PA.5.2 Continuous Improvement

Predictable

Metrics make process performance and results controllable

Level 4 Predictable

PA.4.1 Measurement
PA.4.2 Process Control

Established

Predefined processes are tailored for specific use, resources are managed.

Level 3 Established

PA.3.1 Process Definition
PA.3.2 Process Ressource

Level 2 Managed

PA.2.1 Performance Management
PA.2.2 Work Product Management

Managed

Process and work products are managed, responsibilities identified.

Level 1 Performed

PA.1.1 Process Performance

Performed

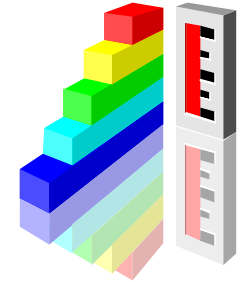
processes are intuitively performed, input and output work products are available

Level 0 Incomplete

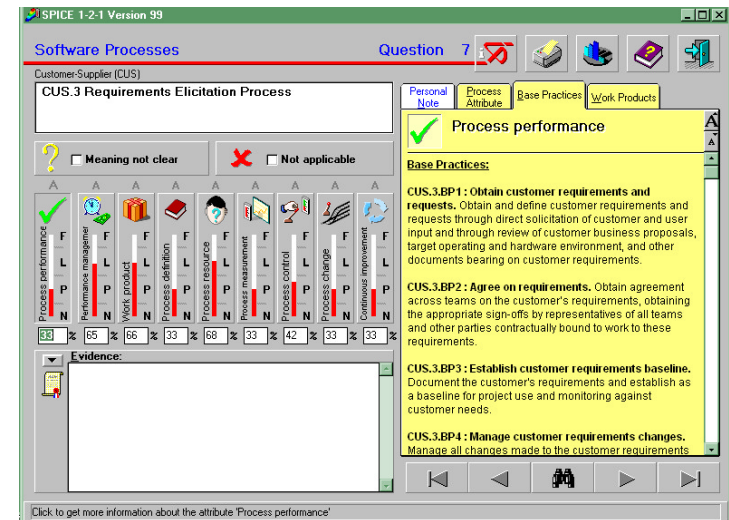
Incomplete

Performance and results are incomplete, chaotic processes

Assessment Tool SPiCE 1-2-1



- ❖ Includes the complete definition of ISO 15504 Part 5
- ❖ Captures ratings & observations
- ❖ Produces reports & charts



	PA 1.1 perform	PA 2.1 managework	PA 2.2 prod. defined	PA 3.1 resource	PA 3.2 measure	PA 4.1 control	PA 4.2 change	PA 5.1 improve	PA 5.2
ENG.1 Development Process									
ENG.1.1 System Requirements Analysis and Design Process									
ENG.1.2 Software Requirements Analysis Process									
ENG.1.3 Software Design Process									

SPiCE: Assessment Results

For each process: ratings of process capability attributes

	PA11 perform	PA21 managework	PA22 prod.defined	PA31 resource	PA32 measure	PA41 control	PA42 change	PA51 improve
ENG.1 Development process	P	P	P	P	P		P	P
ENG.1.1 System requirements analysis and design process	F	P	P		P		P	P
ENG.1.2 Software requirements analysis process	P	P	P		P	P		P
ENG.1.3 Software design process	P	P	P	P	P		P	
ENG.1.4 Software construction process	F	F	F	P	F	P	P	P
ENG.1.5 Software integration process	F	F	F	P	P		P	P
ENG.1.6 Software testing process	P							
ENG.1.7 System integration and testing process								

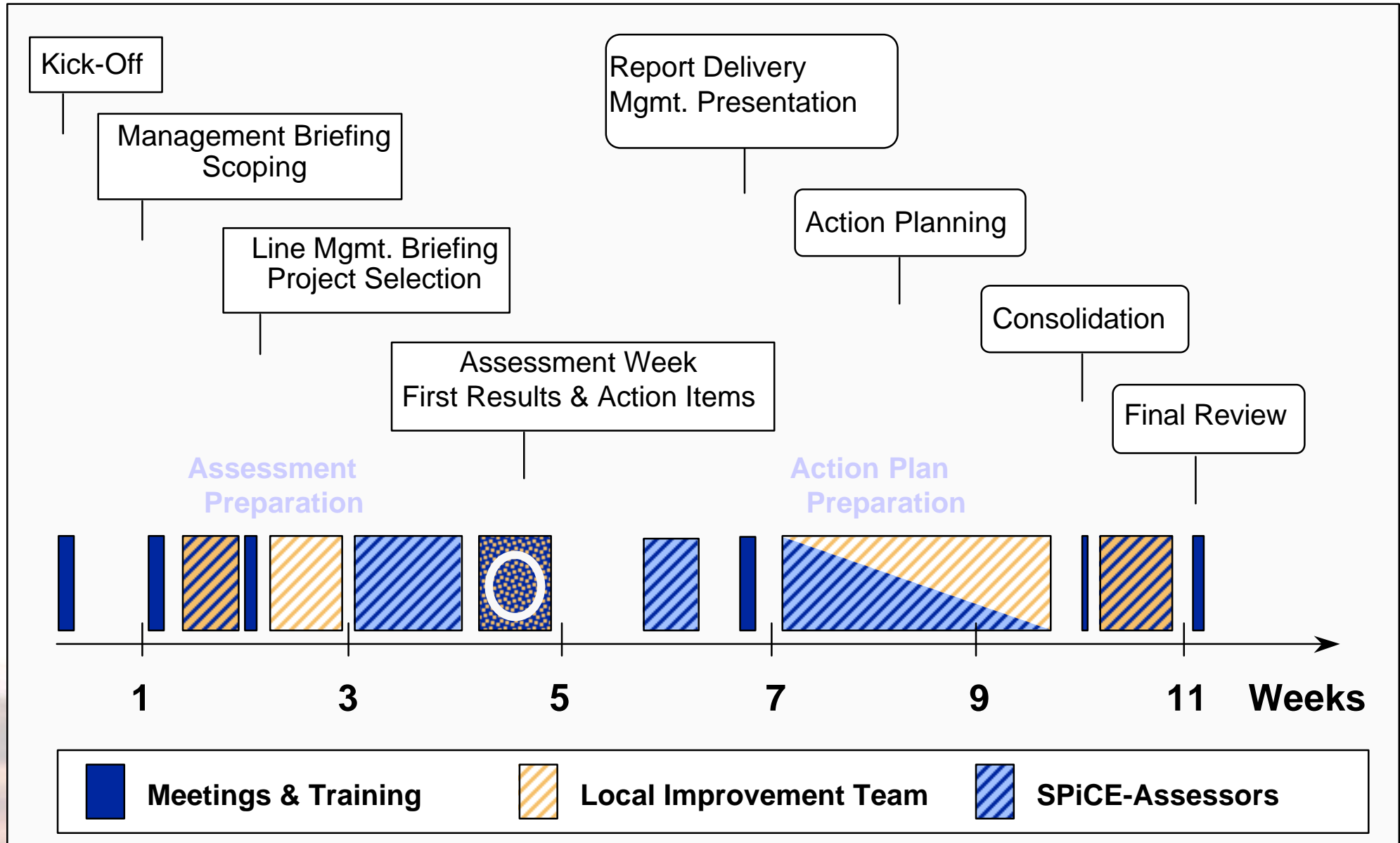
N ...Not achieved
P ...Partially achieved
L ...Largely achieved
F ...Fully achieved

SPiCE: Assessment Results

Processes versus Capability Levels

	Capability Level 1	Capability Level 2	Capability Level 3
CUS.1 Acquisition Process			
CUS.1.1 Acquisition Preparation Process			
CUS.1.2 Supplier Selection Process			
CUS.1.3 Supplier Monitoring Process			
CUS.1.4 Customer Acceptance Process			
CUS.2 Supply Process			
CUS.3 Requirements Elicitation Process			
CUS.4 Operation Process			
CUS.4.1 Operational Use Process			
CUS.4.2 Customer Support Process			
ENG.1 Development Process			
ENG.1.1 System Requirements Analysis and Design Process			
ENG.1.2 Software Requirements Analysis Process			
ENG.1.3 Software Design Process			
ENG.1.4 Software Construction Process			
ENG.1.5 Software Integration Process			
ENG.1.6 Software Testing Process			
ENG.1.7 System Integration and Testing Process			
ENG.2 System and Software Maintenance Process			
SUP.1 Documentation Process			
SUP.2 Configuration Management Process			
SUP.3 Quality Assurance Process			
SUP.4 Verification Process			

SYNSPiCE Assessment Performance



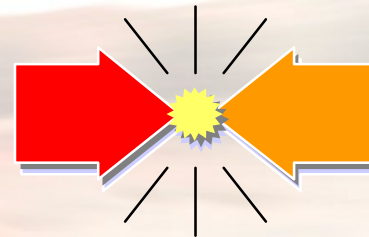
Do People want Processes?

- ❖ **Yes and No** (like always there are pros and cons)
- ❖ **Processes** (and their instances) are harder to understand than *simple tasks*...
- ❖ Managers like processes – *if they are successful*
- ❖ Managers dislike processes – *if they fail*
- ❖ *Processes will only function, if people do not hate them.*
- ❖ ⇒ *Make people love processes.*



How to motivate Engineers?

- ❖ It does not make sense if only the quality staff or the CEO wants to have process improvement
- ❖ It would be perfect, if all teams, groups, persons believe that they need process improvement!
- ❖ It is not easy, to establish the desire for better processes – cause most of the time, everyone will resist against any changes....



Lao Tse already said:

**Assessment for employee
participation and development**

Tell me and I will

- forget

Show me and I will

- remember

Involve me and I will

- understand

Create a culture ready for changes

- ❖ Prepare your staff:
 - ❖ Perform **briefings** explaining the assessment and improvement approach
 - ❖ Perform **trainings** to inform your project managers and quality staff about SPICE
- ❖ If you do it the first time, then **involve** as many persons as possible in the assessments
- ❖ Perform at least one assessment per project or better per group
- ❖ There should be **three persons** participating at each assessment
- ❖ At some assessments mix the hierarchy: let CEO, project manager and engineer perform the assessment together.

What will Happen

- ❖ During the assessment, your employees will start to develop an **understanding** for processes
- ❖ They will **accept** the need for processes in some areas
- ❖ Of course they will **identify** lots of weaknesses
- or better said: a potential for improvement
- ❖ At the end of an assessment, they will have a look at the charts and they will be totally surprised:

These charts represent their own company!

- ❖ Now this assessment has got it's **legitimation**.
The engineers **believe** improvements will have a real chance.