

ISO 15504 (SPiCE)

Supplier Capability Assessments [Assessments bei Lieferanten]

DI Christian Steinmann

HM&S GmbH
Pfeifferhofweg 12
A - 8045 Graz

Vox (43) 316 696 100

Fax (43) 316 696 110

www.hms.org

Auftraggeber vs. Lieferant

- ❖ Der Erfolg für alle Beteiligten ergibt sich aus einer **reifen** Partnerschaft:
 - ❖ Termintreue als Resultat von **Prozessorientierung**
 - ❖ Produktqualität als Resultat von **Prozessqualität**
 - ❖ Produktreife als Resultat von kontinuierlicher **Prozessverbesserung**

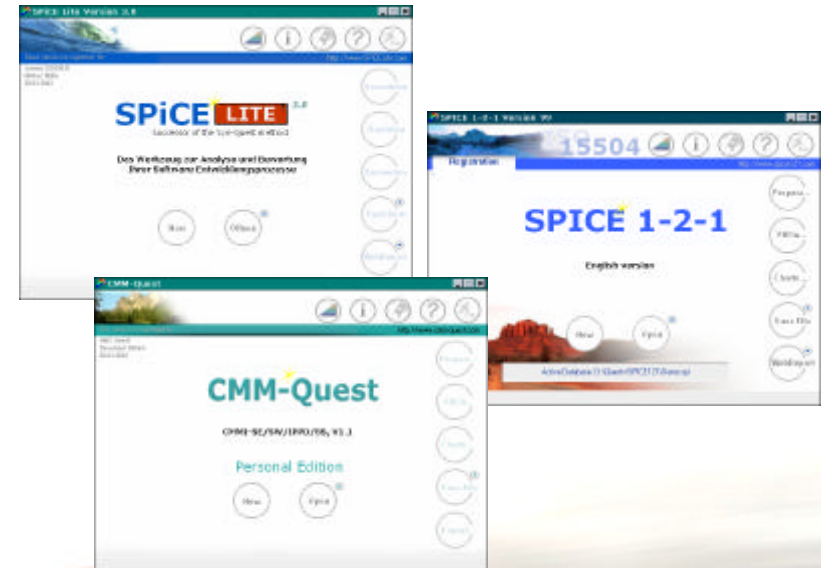
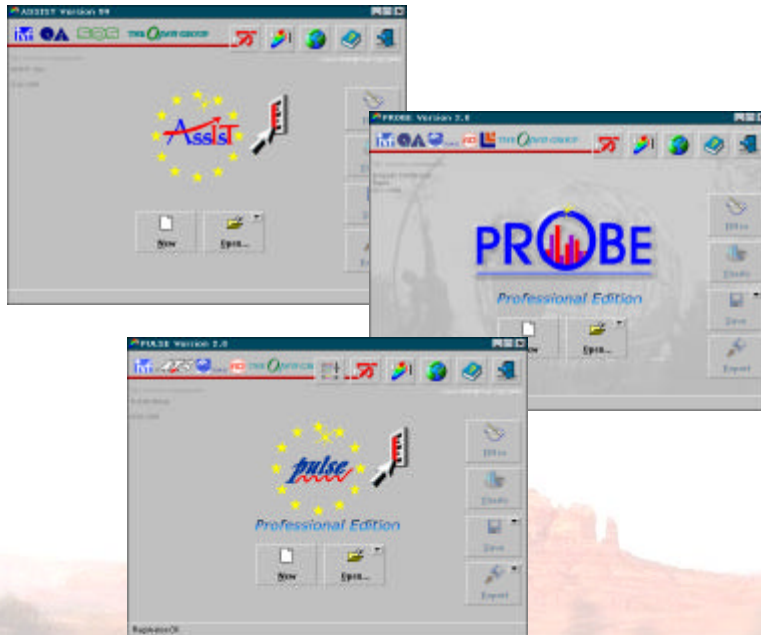


Auftraggeber vs. Lieferant

Assessment Tools

Für Auftraggeber

Für Lieferanten



Wo braucht man Prozesse?

- ❖ Software Entwicklung ist komplex
- ❖ Es gibt unendlich viele Möglichkeiten „es“ falsch zu machen
- ❖ Wenn man gewisse Regelungen, Verfahren **Prozesse** hat, dann...
 - ✧ Ähnliche Dinge können ähnlich durchgeführt werden
 - ✧ Man weiss im voraus, was man tun wird
 - ✧ Man kann aus der Vergangenheit lernen
 - ✧ Software Entwicklung wird **deterministisch**
 - ✧ Software Entwicklung kann **gemanaged** werden

The Process View on Quality

There is wide consensus

The better is the process

- ❖ the better is the product quality
- ❖ the more accurate are the plans
- ❖ the earlier are the deliveries
- ❖ the cheaper is the cost

(the manager's dream)

Reduce cost and improve quality by avoiding problems.

The First Step

Determine your current position:

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



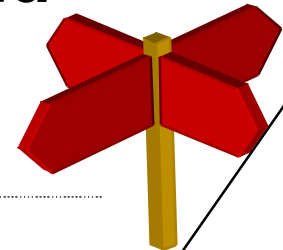
***If you don't know, where you are,
a map won't help.***

... the Next Step...

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.*



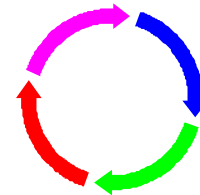
Determine the improvement goals:

***Establish* the improvement goal.**

Implement the improvement

Measure the improvement gains.

Improvement is a continuous process.



What is ISO/IEC TR 15504?

- ❖ **International standard for assessing software processes**
 - ✧ Developed in parallel with other software engineering standards
- ❖ **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

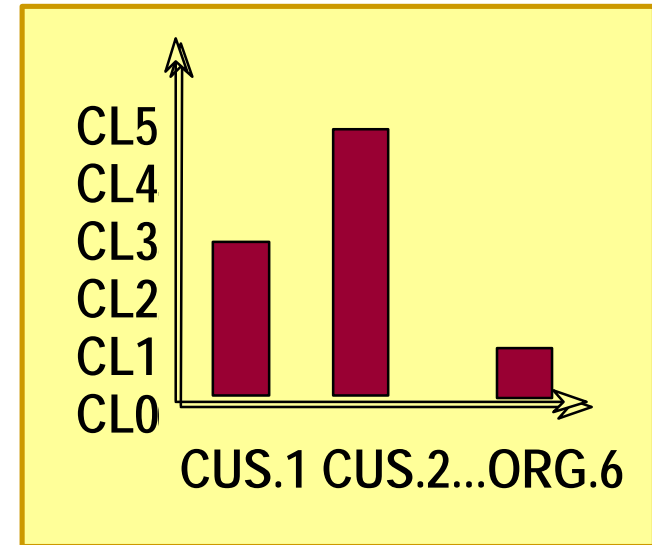
❖ Two-dimensional model for processes and process capability

❖ 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

Process Category

Process

Basic

Component

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)

Total Number of Base Practices (249)

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)



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

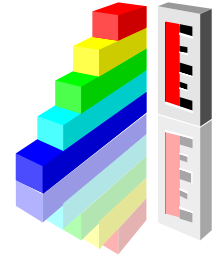
processes are intuitively performed, input and output work products are available

Level 0 Incomplete

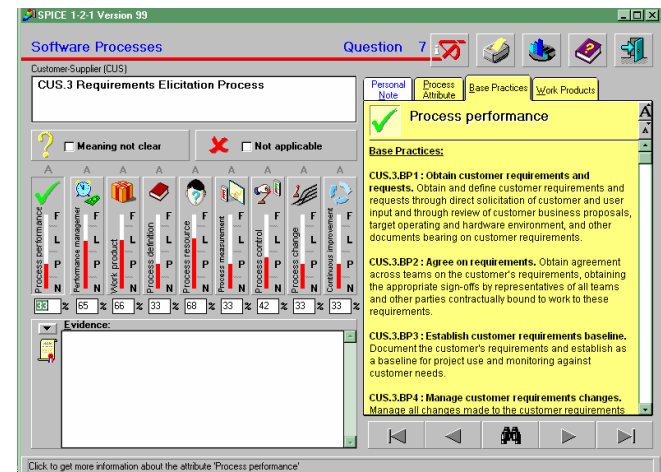
Incomplete

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	PA61 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	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

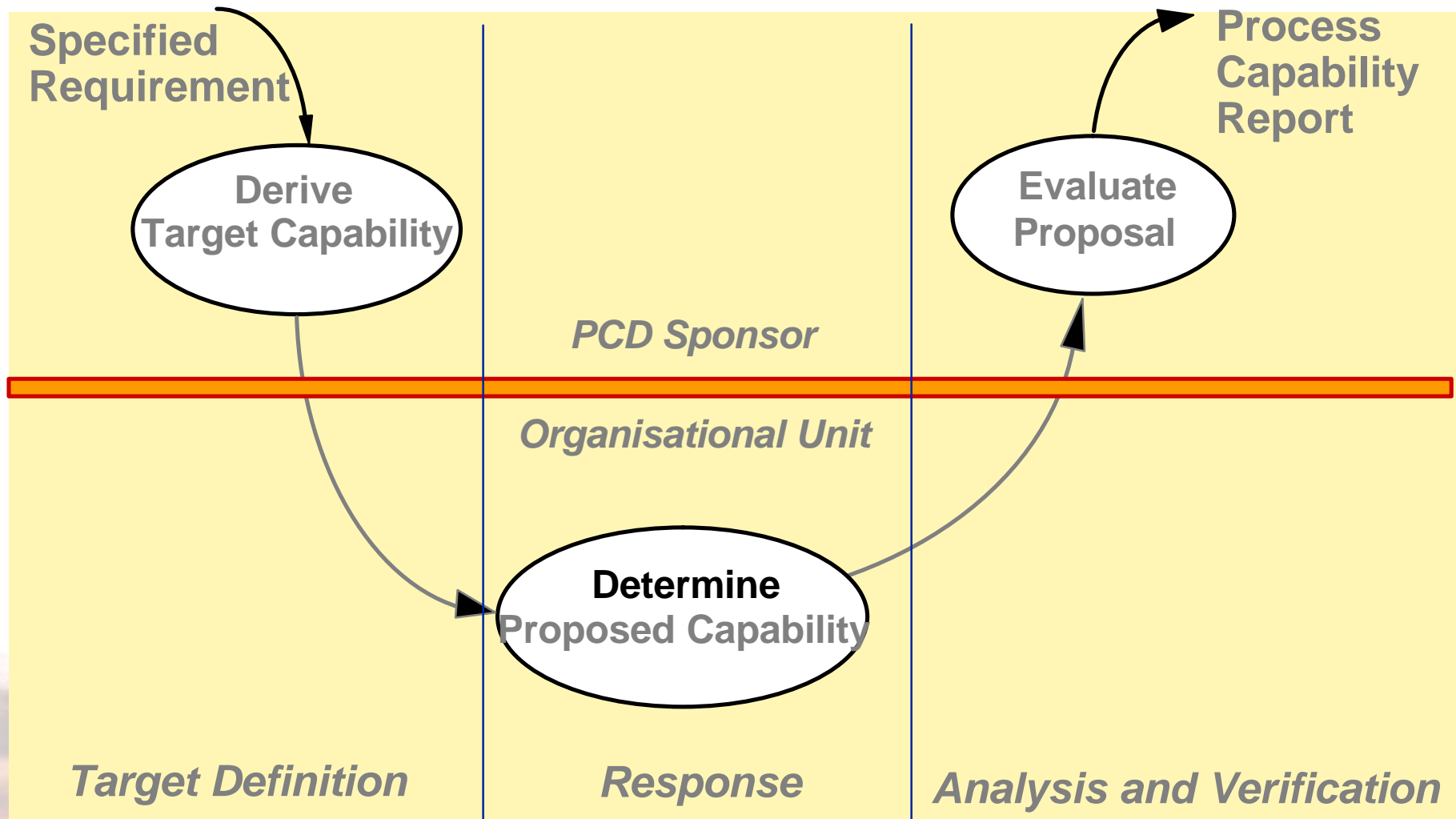
Processes versus Capability Levels

	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			

Support Customer Objectives and Requests

- **Are your software processes suitable to meet the requirements?**
- **Do you have the capability to carry out the requirements?**
- **Do you have adequate process in place to manage subcontracts?**
- **Do you plan and design for re-use?**

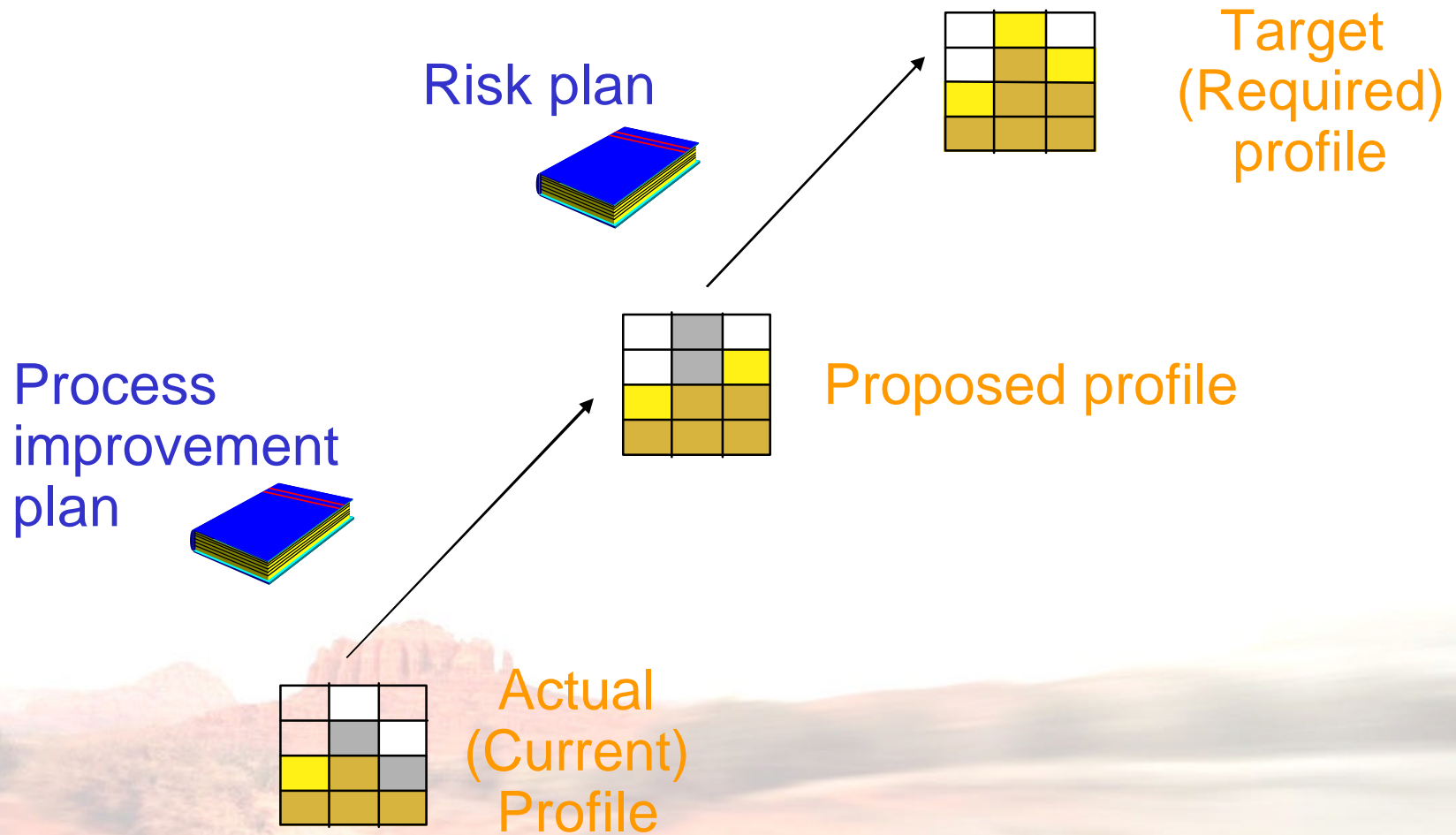
The Process Capability Determination (PCD) Process



Target Profile

PA 3.1		Largely	
PA 2.2		Fully	Largely
PA 2.1	Largely	Fully	Fully
PA 1.1	Fully	Fully	Fully
	Process A	Process B	Process C

Capability Determination



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.