Effectively Managing Process Compliance

Systems Engineering in the Face of Multiple Models, Standards and Best Practices.

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Agenda

- Current Challenges
- Goals
- Proposed Solution
- Tool Support and Interfaces
- Benefits

Current Challenges

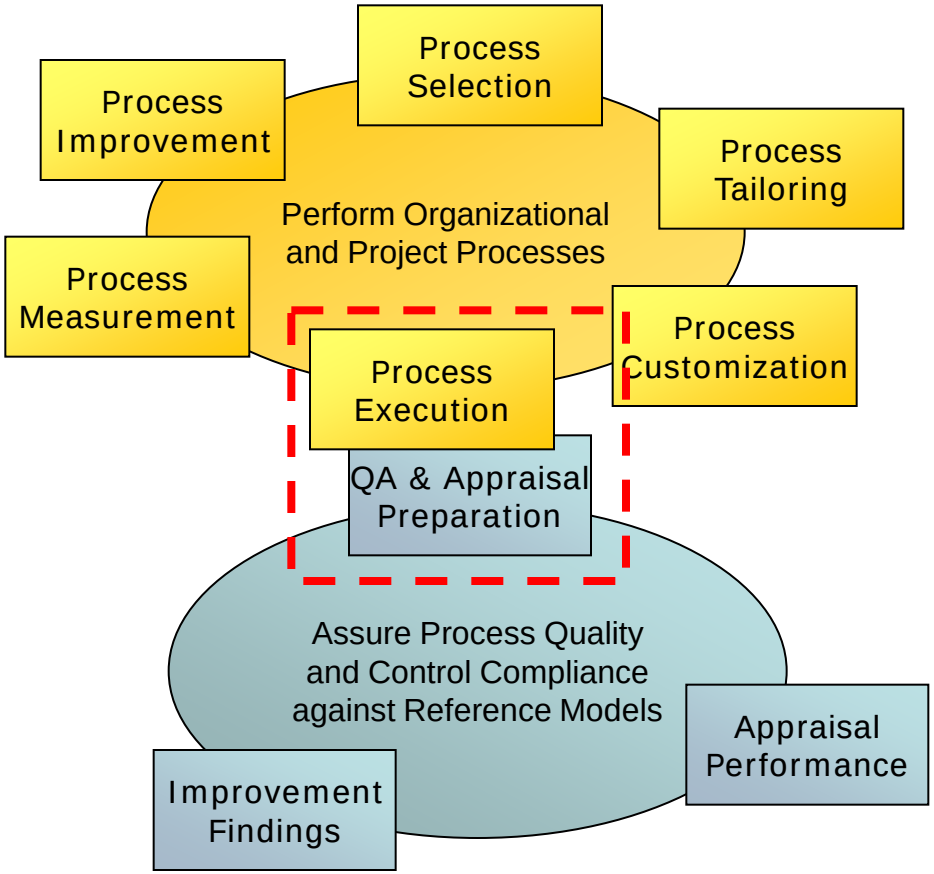
- Heavy time and cost pressure affects product quality
- Frequent audits or appraisals
- Up to 25% of work hours for audit preparation and performance
- Assure compliance with specific models or standards for safety, security, quality, reliability, etc. in parallel

Goals

- Allow organizations to focus on the definition and implementation of processes
- Provide automated support to facilitate enactment of the processes
- Provide support for continuously monitoring adherence to the processes
- Support appraisal preparation and performance by automating evidence collection
- Effectively collect, manage and track non-conformances to closure in order to improve processes and secure future audit success

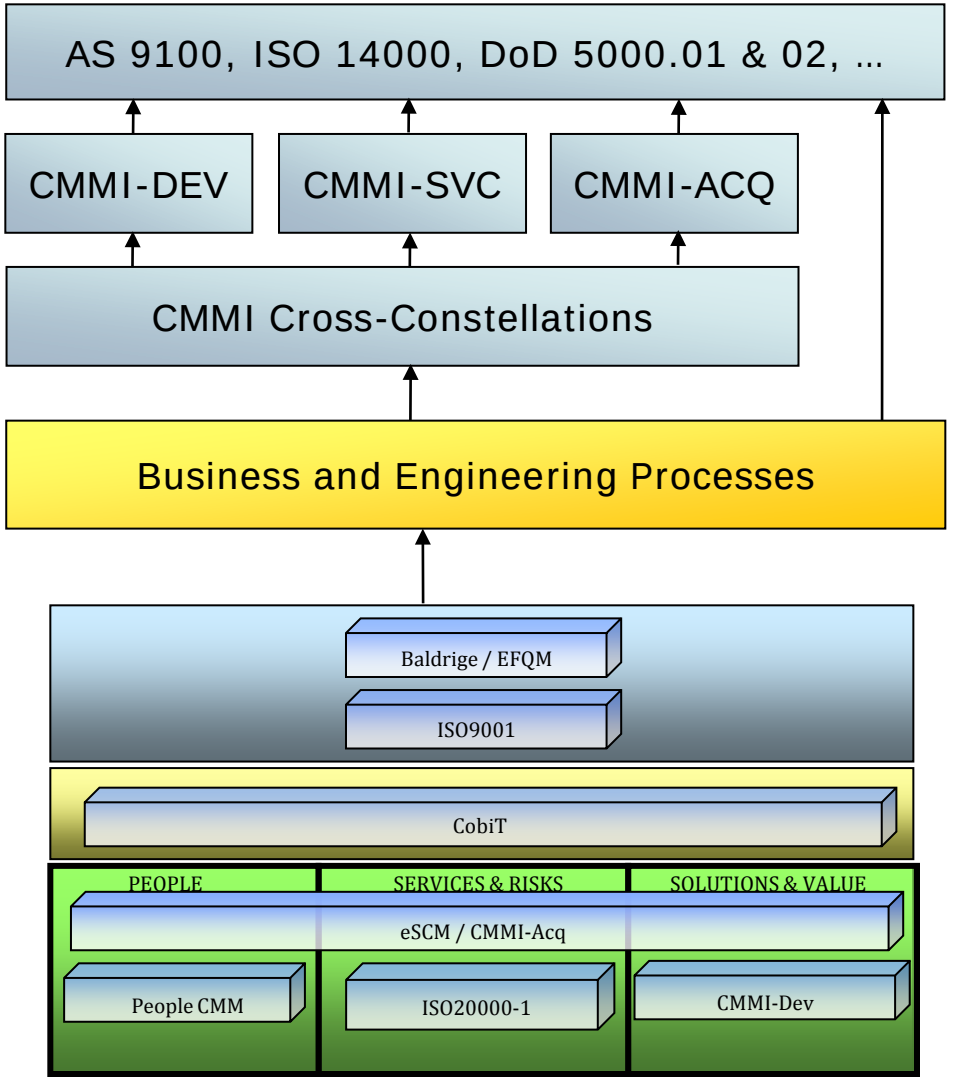
Key Idea

- Actively use the development processes in projects, i.e. by creating work products in projects
- Link the actively used development processes to the models or standards that need to be fulfilled (e.g. CMMI, ISO)
- Continuously perform PPQA activities
- Result: evidence data will automatically be collected in the background



Multi-model Support

- Multiple reference models can be linked into multi-models
- Multimodel links are weighted
- Multimodels are specific to organization (i.e. dependent on type of business)

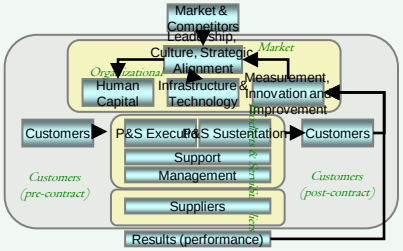


Process Composition and Definition

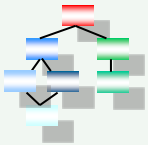
- Establish and maintain Organization Standard Process model(s) in Model Wizard or Stages or tooling with similar capability.
  - Create or import a model of your enterprise processes that incorporates the desired best practices of applicable standards and model(s). Update when needed.
    - *This step is performed once for each level at which the process is tailored within the enterprise.* (e.g. Enterprise, Division, Department, Product Line)
    - *Ultimately it is tailored to a particular project . At that point it becomes a representation of the Project's Defined Process.*
    - *It can then be used as the basis for identifying and analyzing information and evidence supporting:*
      - *Project QA activity and monitoring,*
      - *Internal compliance audits, and*
      - *External benchmarking appraisals or compliance audits.*

Relationship

Enterprise Architecture, Best Practices, Process Improvement



Business Architecture



Activity A – Missing Process

Activity B – Needs Process Improvement

ISF CPP X Objective Z
ISO Clause X
PCCM Practice Y

ISF CPP X Objective Z
ISO Clause B
CMMI Practice SP #.#

Process Improvement Implementation Guidance

Best Practices

Relationships: Process Architecture, Best Practices, Audits

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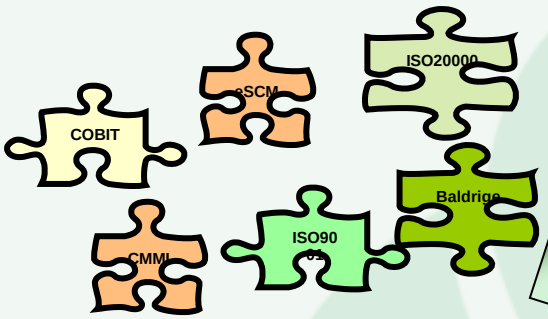
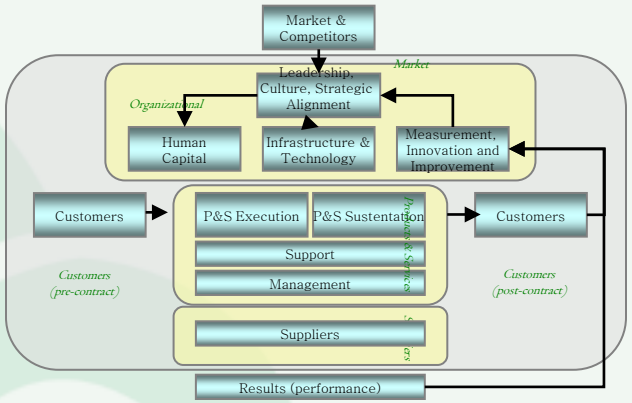
ISF for Excellence

Best Practices



Integration / System



Process Definition

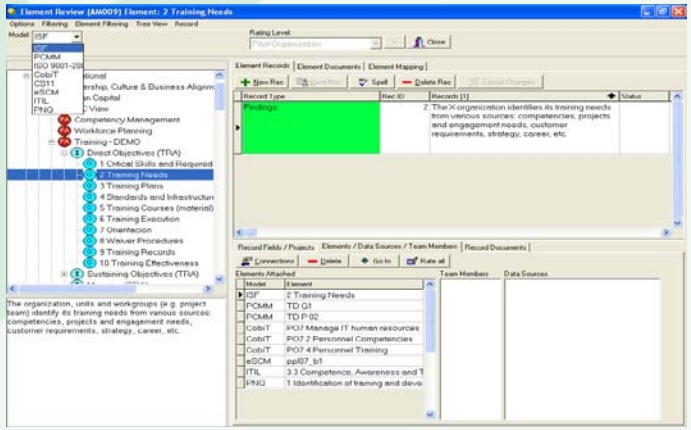
Process Compliance

Diagnostic Tools

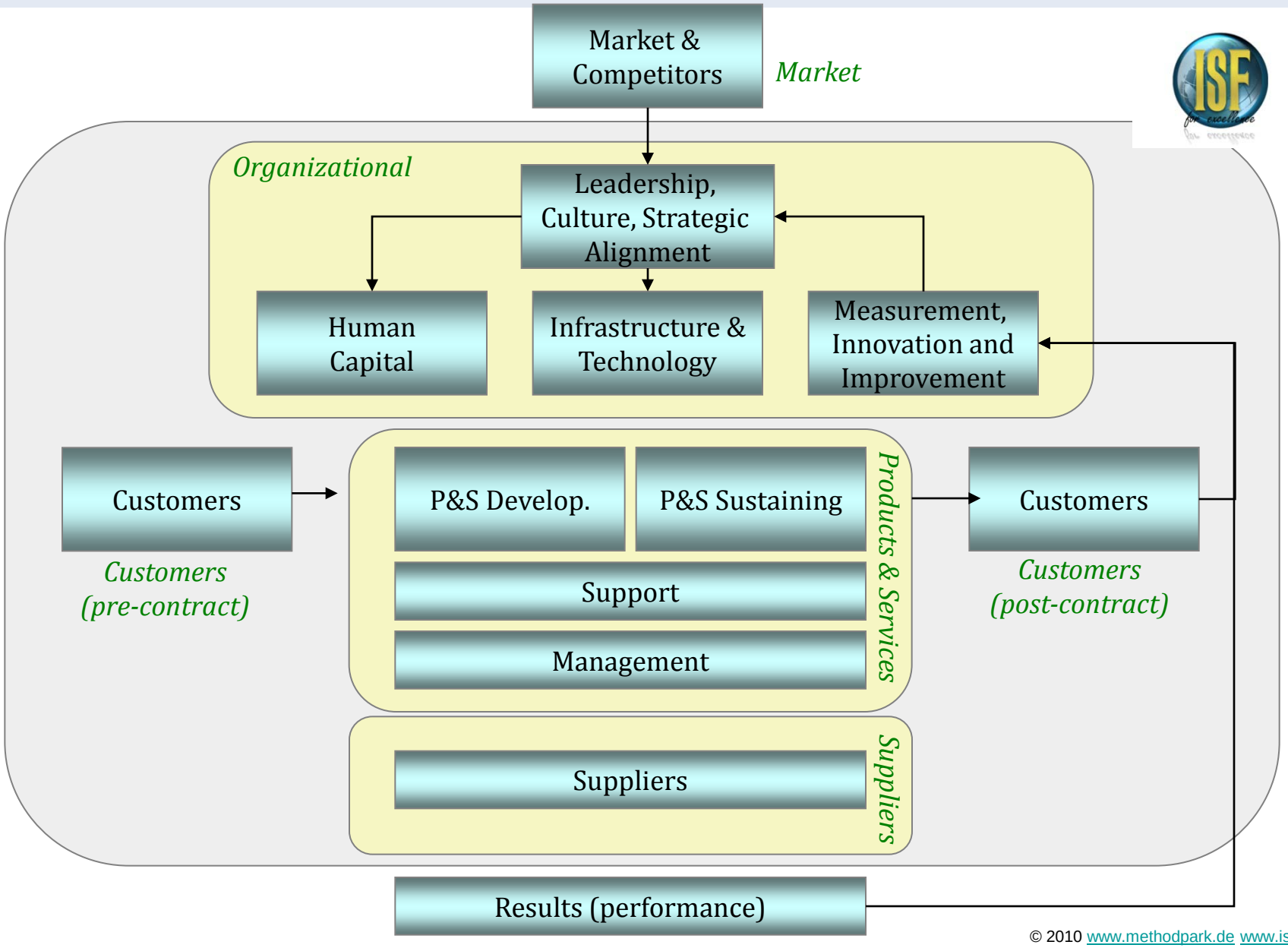
Customer Process Architecture

PPQA / Audit / Appraisal Findings

Enterprise Appraisal

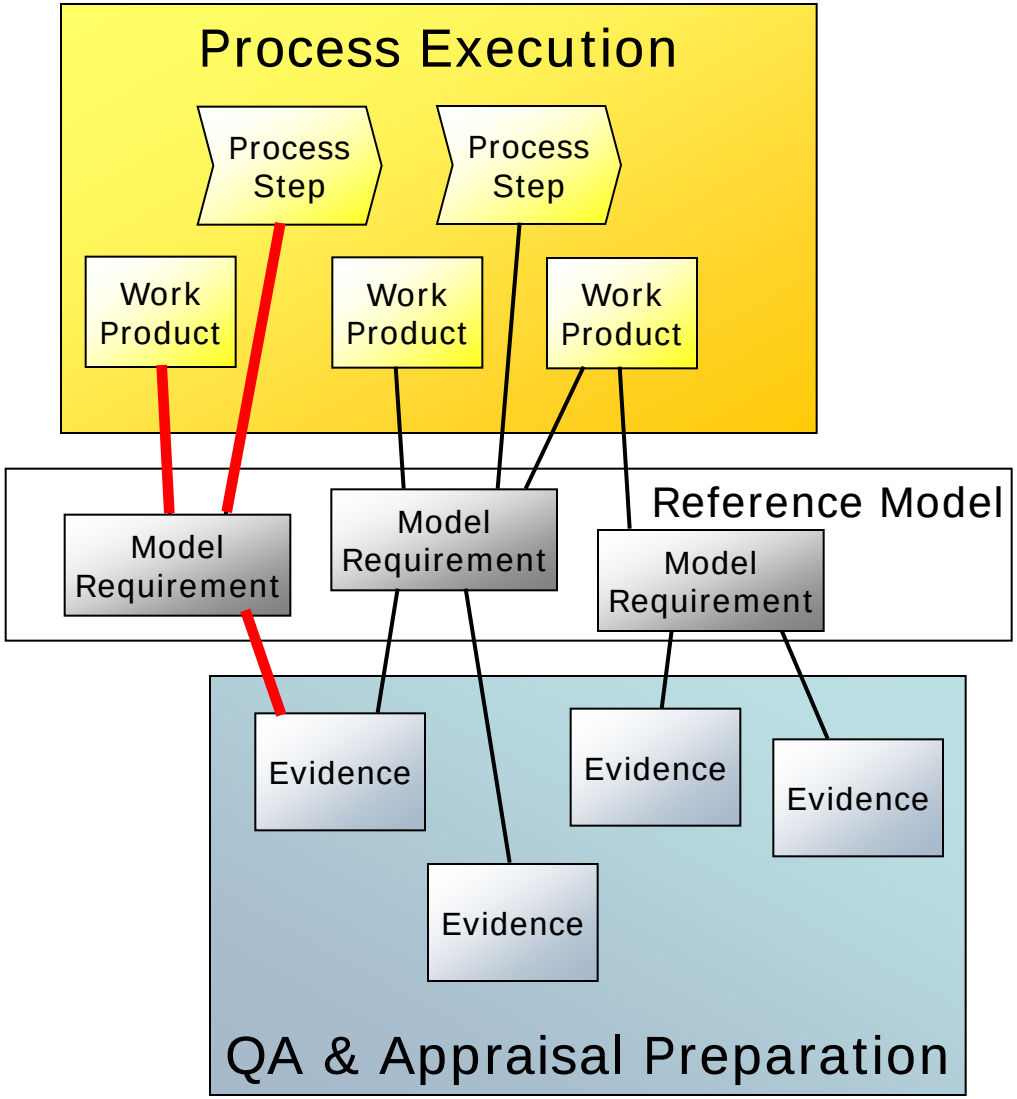


ISF *for Excellence* – Systemic View Integration Framework

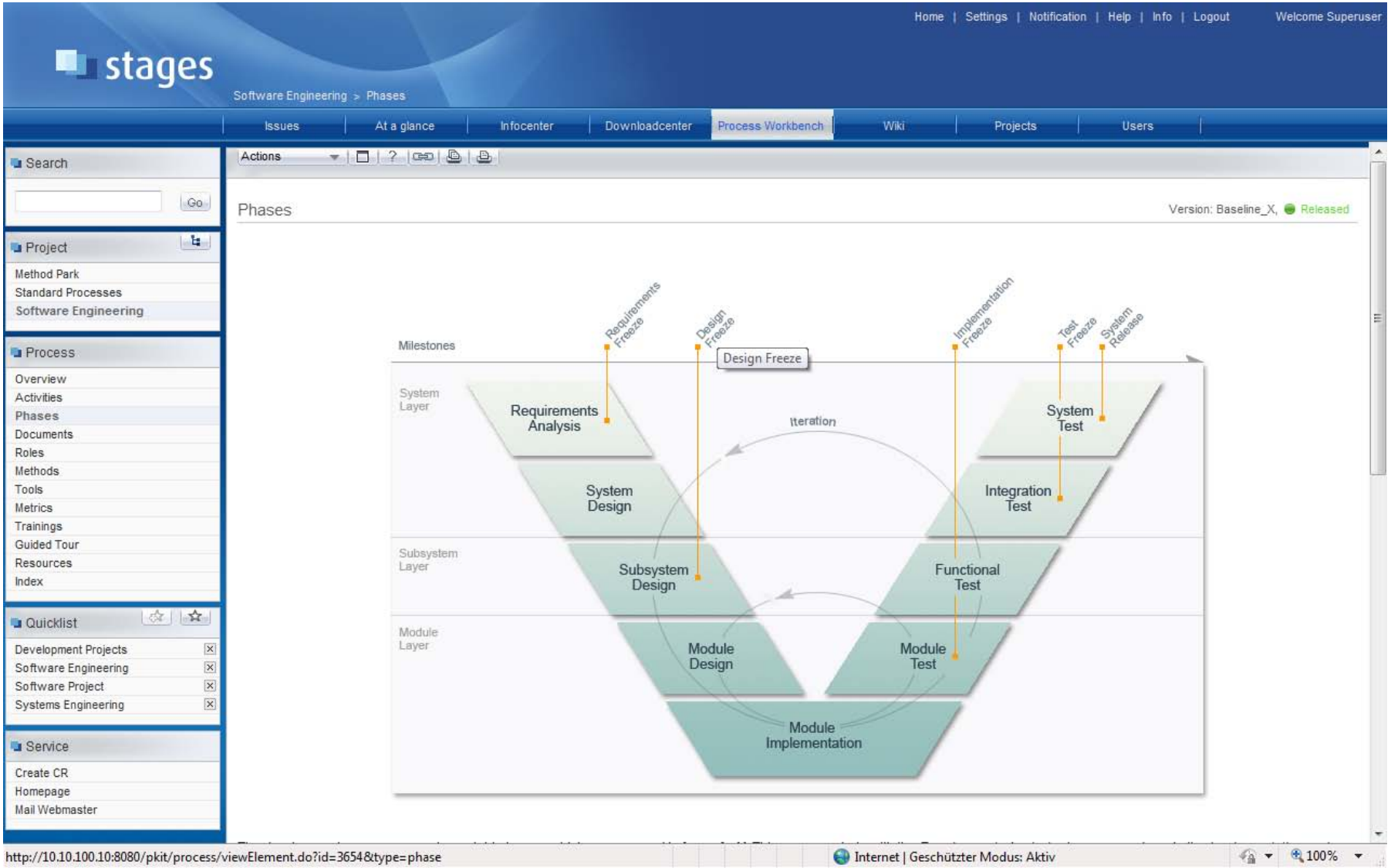


Solution Details

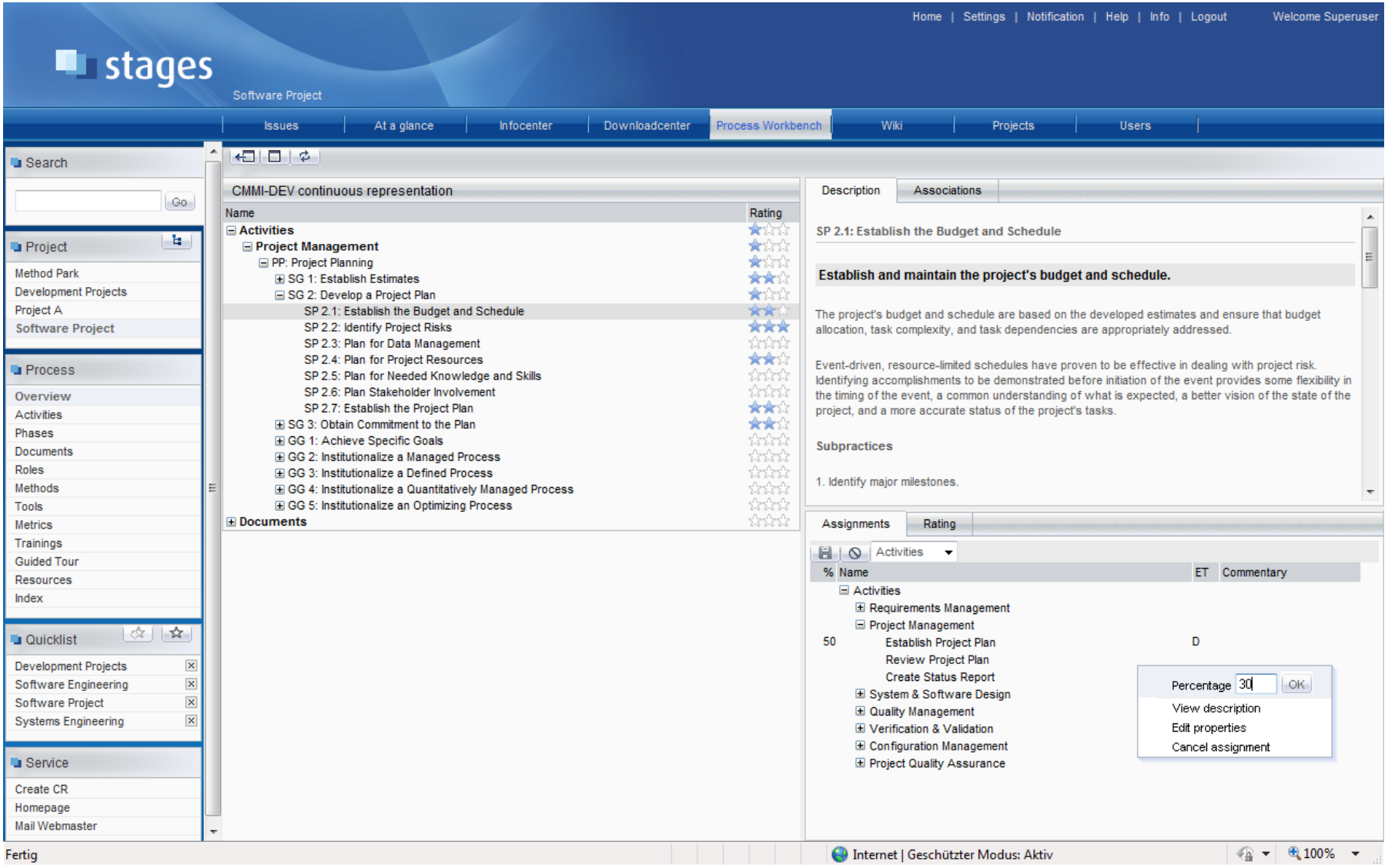
- Reference models are broken into different model requirements
- Process elements are linked with model requirements
- Model requirements are mapped to evidences
- **Evidence data maps can be generated**



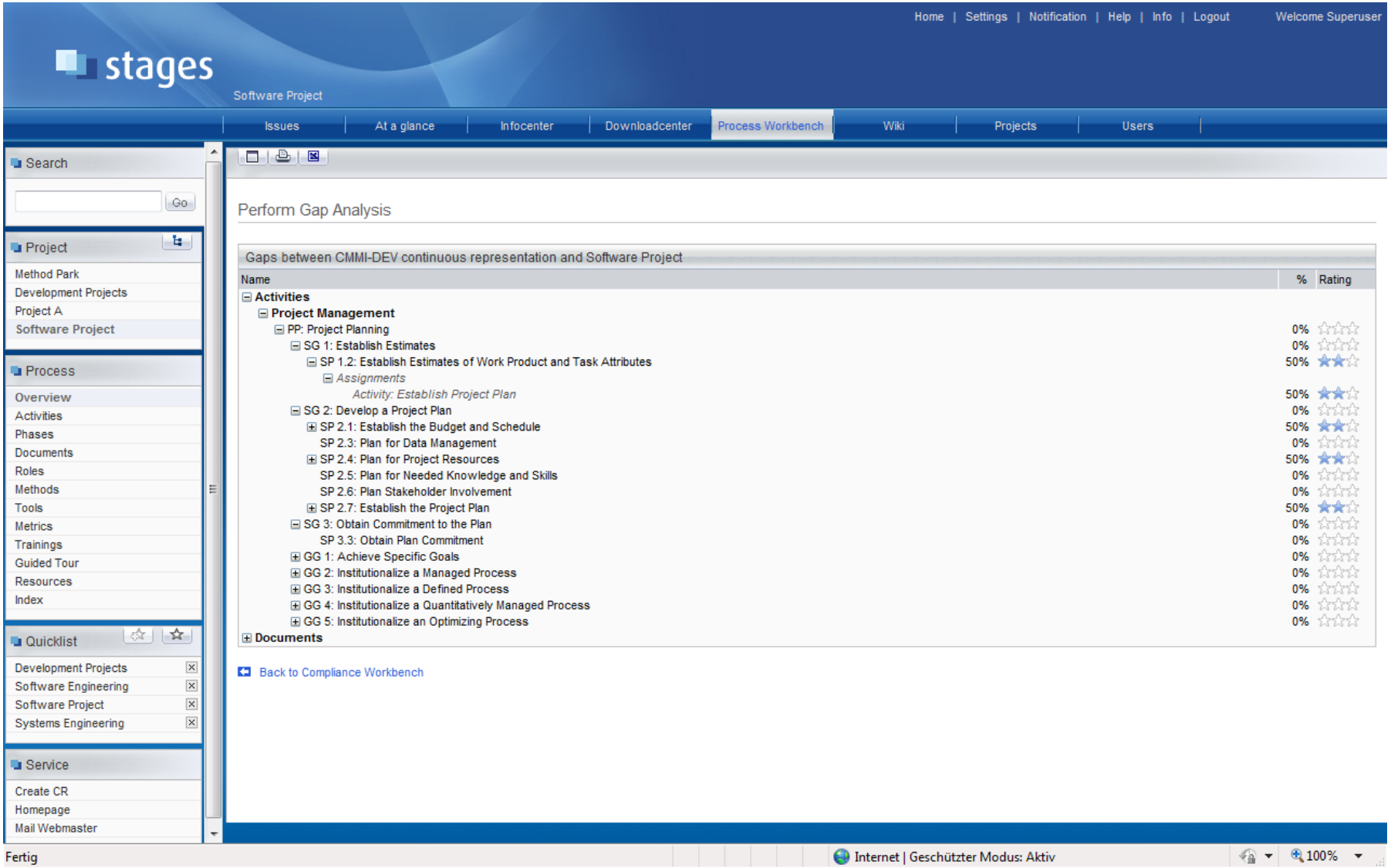
Example: Process Lifecycle



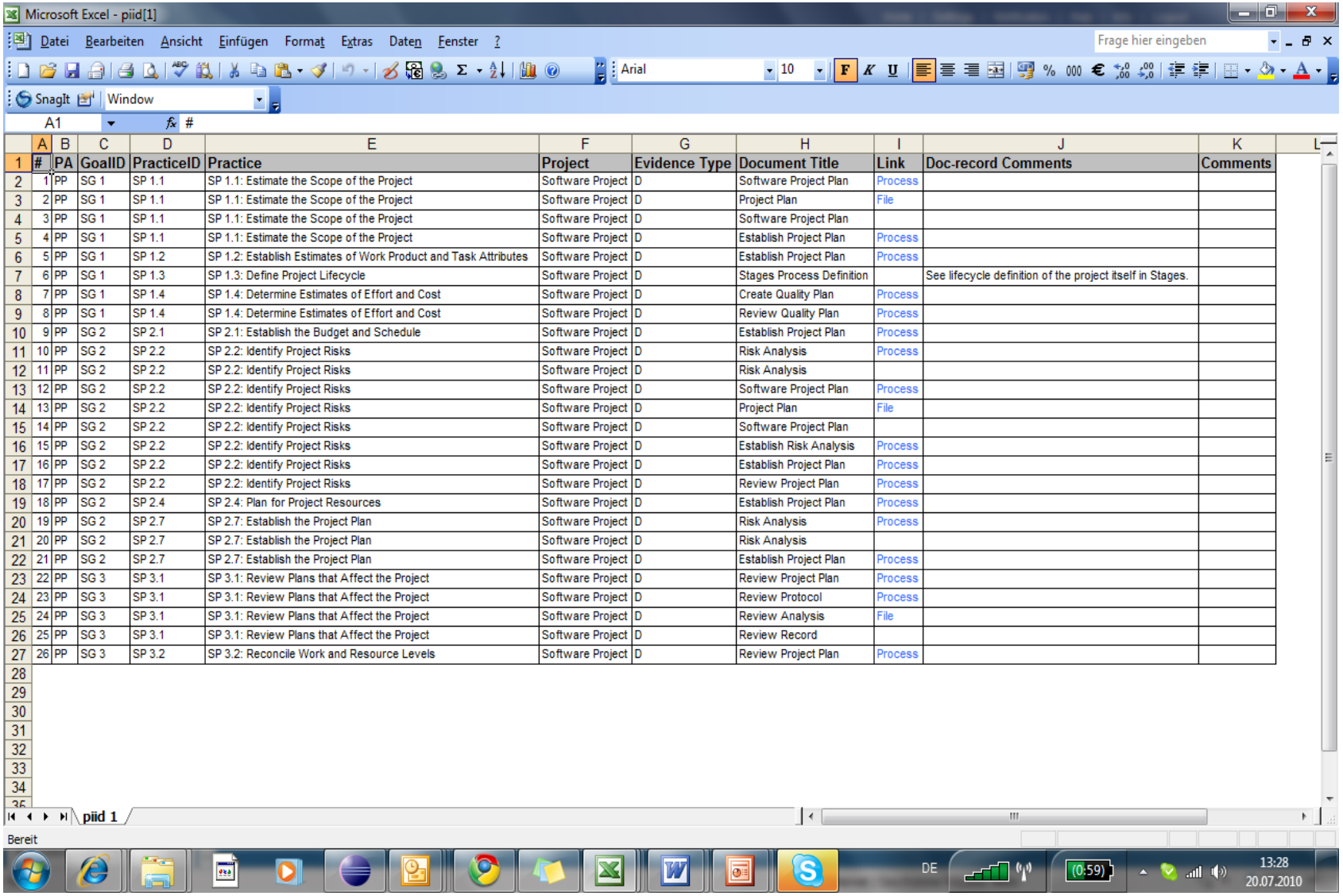
Example: Process Compliance Mapping



Example: Compliance Gap Analysis



Example: Evidence Data Generation



Microsoft Excel - piid[1]

#	PA	GoalID	PracticeID	Practice	Project	Evidence Type	Document Title	Link	Doc-record Comments	Comments
1	PP	SG 1	SP 1.1	SP 1.1: Estimate the Scope of the Project	Software Project	D	Software Project Plan	Process		
2	PP	SG 1	SP 1.1	SP 1.1: Estimate the Scope of the Project	Software Project	D	Project Plan	File		
3	PP	SG 1	SP 1.1	SP 1.1: Estimate the Scope of the Project	Software Project	D	Software Project Plan			
4	PP	SG 1	SP 1.1	SP 1.1: Estimate the Scope of the Project	Software Project	D	Establish Project Plan	Process		
5	PP	SG 1	SP 1.2	SP 1.2: Establish Estimates of Work Product and Task Attributes	Software Project	D	Establish Project Plan	Process		
6	PP	SG 1	SP 1.3	SP 1.3: Define Project Lifecycle	Software Project	D	Stages Process Definition		See lifecycle definition of the project itself in Stages.	
7	PP	SG 1	SP 1.4	SP 1.4: Determine Estimates of Effort and Cost	Software Project	D	Create Quality Plan	Process		
8	PP	SG 1	SP 1.4	SP 1.4: Determine Estimates of Effort and Cost	Software Project	D	Review Quality Plan	Process		
9	PP	SG 2	SP 2.1	SP 2.1: Establish the Budget and Schedule	Software Project	D	Establish Project Plan	Process		
10	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Risk Analysis	Process		
11	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Risk Analysis			
12	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Software Project Plan	Process		
13	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Project Plan	File		
14	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Software Project Plan			
15	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Establish Risk Analysis	Process		
16	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Establish Project Plan	Process		
17	PP	SG 2	SP 2.2	SP 2.2: Identify Project Risks	Software Project	D	Review Project Plan	Process		
18	PP	SG 2	SP 2.4	SP 2.4: Plan for Project Resources	Software Project	D	Establish Project Plan	Process		
19	PP	SG 2	SP 2.7	SP 2.7: Establish the Project Plan	Software Project	D	Risk Analysis	Process		
20	PP	SG 2	SP 2.7	SP 2.7: Establish the Project Plan	Software Project	D	Risk Analysis			
21	PP	SG 2	SP 2.7	SP 2.7: Establish the Project Plan	Software Project	D	Establish Project Plan	Process		
22	PP	SG 3	SP 3.1	SP 3.1: Review Plans that Affect the Project	Software Project	D	Review Project Plan	Process		
23	PP	SG 3	SP 3.1	SP 3.1: Review Plans that Affect the Project	Software Project	D	Review Protocol	Process		
24	PP	SG 3	SP 3.1	SP 3.1: Review Plans that Affect the Project	Software Project	D	Review Analysis	File		
25	PP	SG 3	SP 3.1	SP 3.1: Review Plans that Affect the Project	Software Project	D	Review Record			
26	PP	SG 3	SP 3.2	SP 3.2: Reconcile Work and Resource Levels	Software Project	D	Review Project Plan	Process		

Audits and Appraisal Process

1

Use **Model Wizard** to create or import a model that represents your Organizational Standard Model and/or the desired QA Reference Model.

2

Use **Appraisal Wizard (AW)** to setup Appraisal Wizard Audit Template(s) for each type of Audit you want to perform (e.g. setup unique record types, status values, and document types, etc.)

- Create Audit Question records to build audit checklist for set of audit checkpoints.
- Use the Record Documents tab and the document list to identify the expected objective evidence for each audit question.

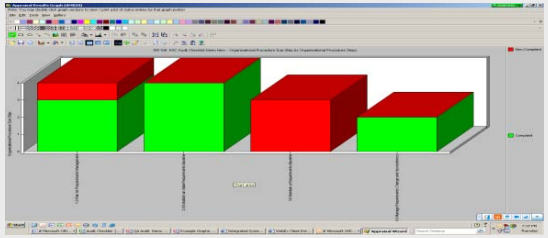
3

Use the AW tool during the audit to document the audit finding(s) (e.g. “Compliance, “Non-Compliance (N/C)”, “Information Needed” record types).

- Write up N/C Action Item records
- Determine compliance ratings

4

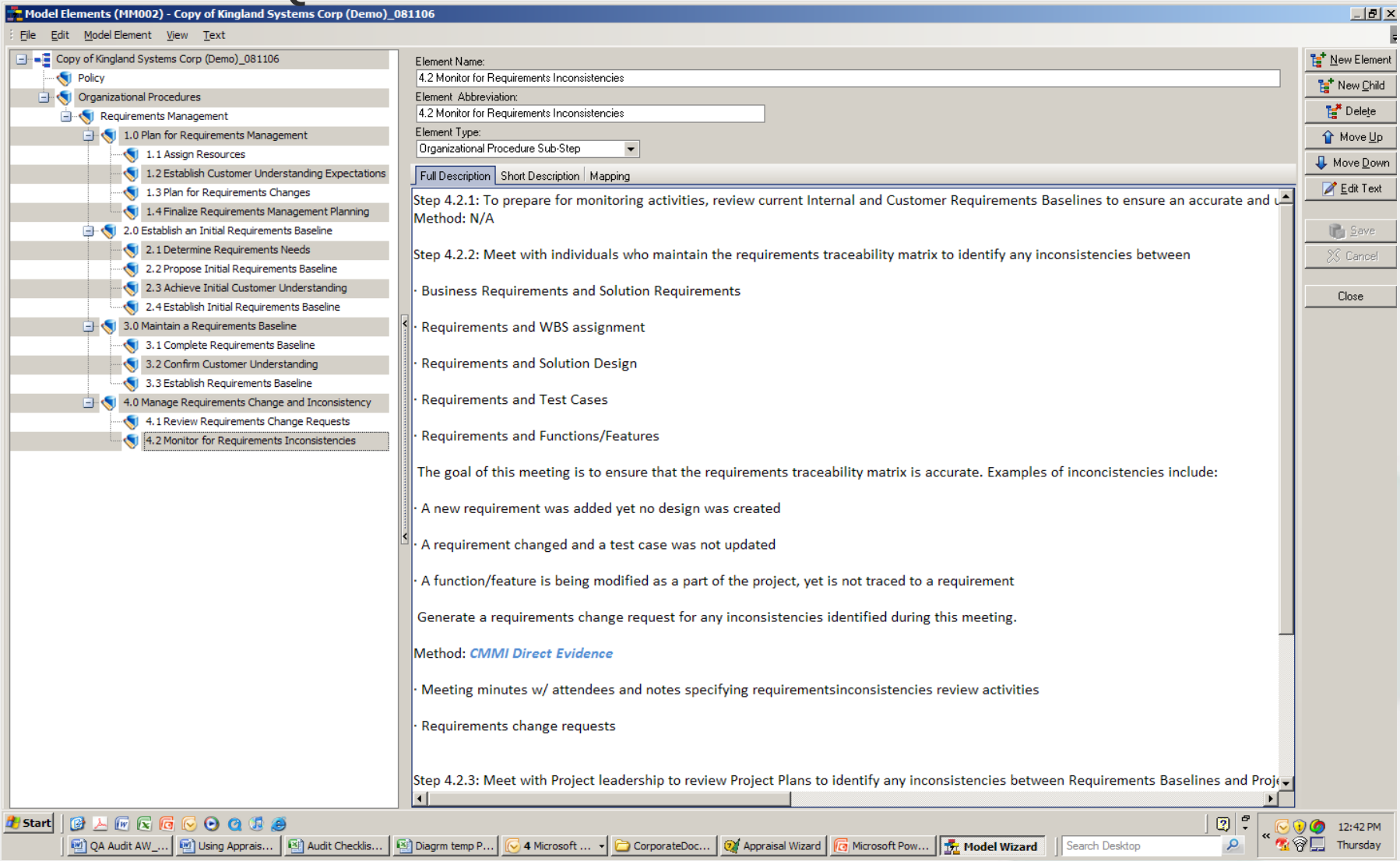
Use the AW tool to build various reports of the audit finding(s) (e.g. Reports of % compliant/% non-compliant findings; List N/C Action Items; etc.) to prepare for follow-on audits.



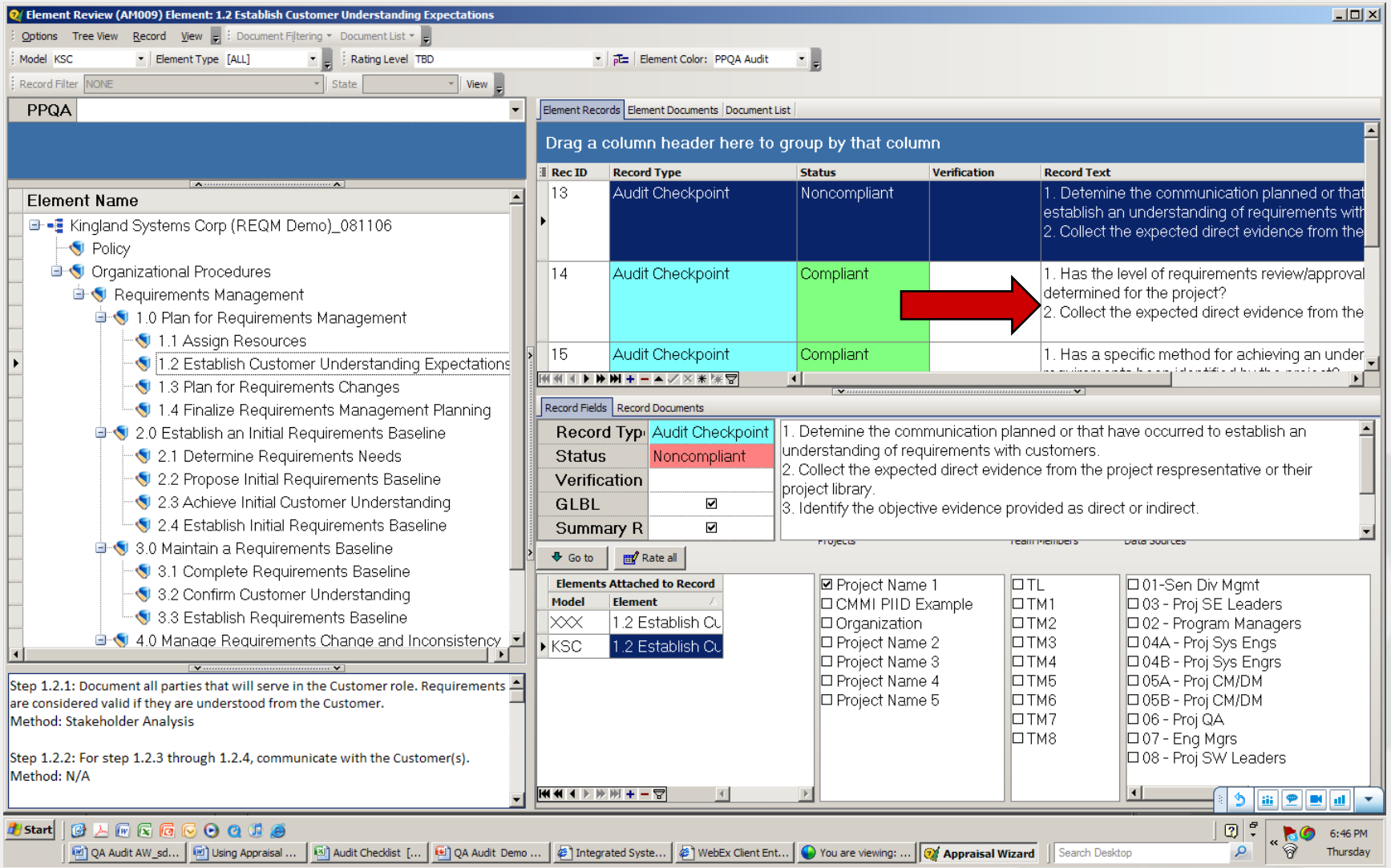
5

- Use **Model Mapper** to map QA Reference model to a standard or model (e.g. CMMI) for use in appraisals.
- Import new *“Mapped Model”* into AW to use audit results and organization's existing data to support Readiness Reviews and Appraisals.

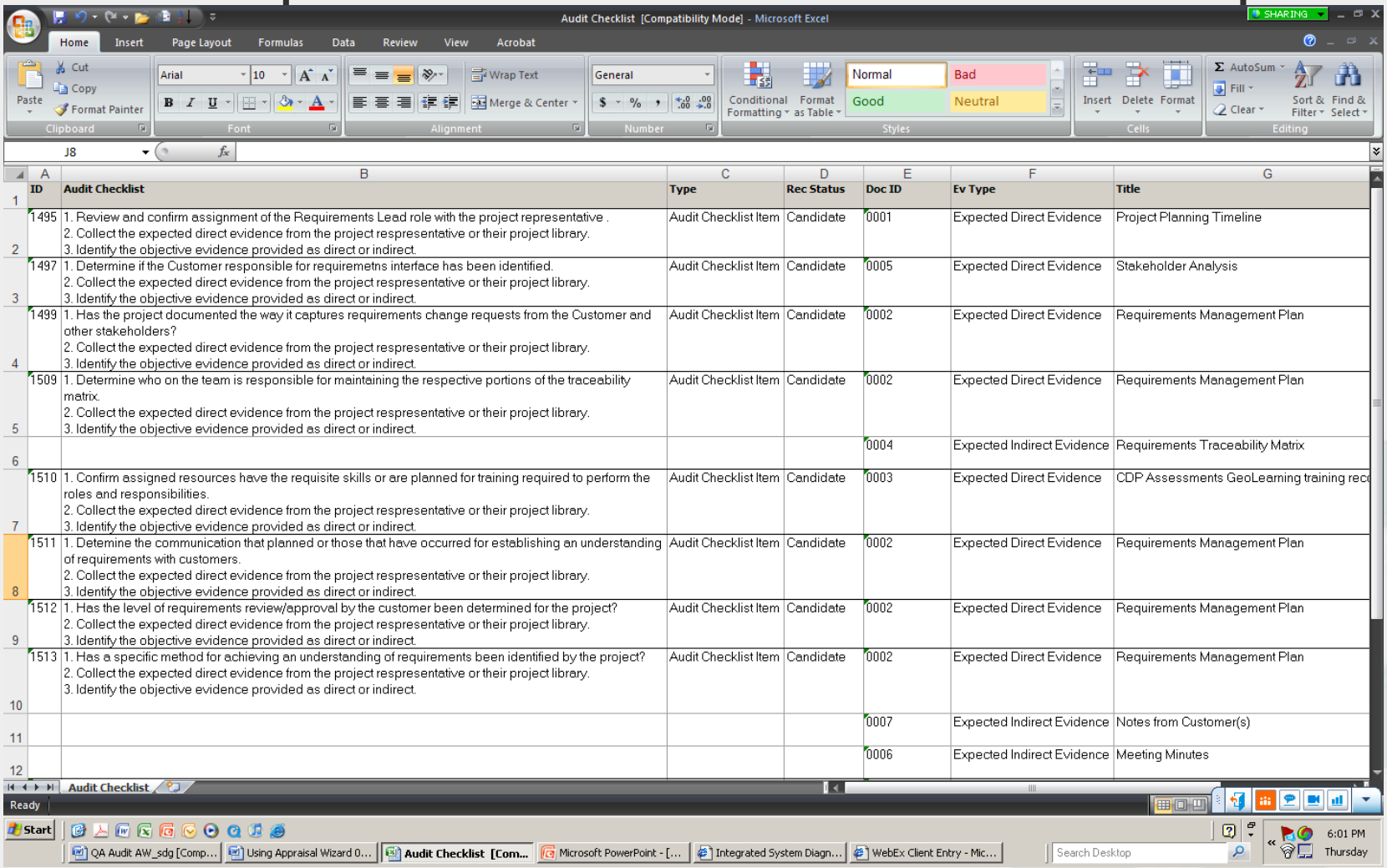
QA Reference Model in Model Wizard



Setup Audit Templates Using QA Reference Model

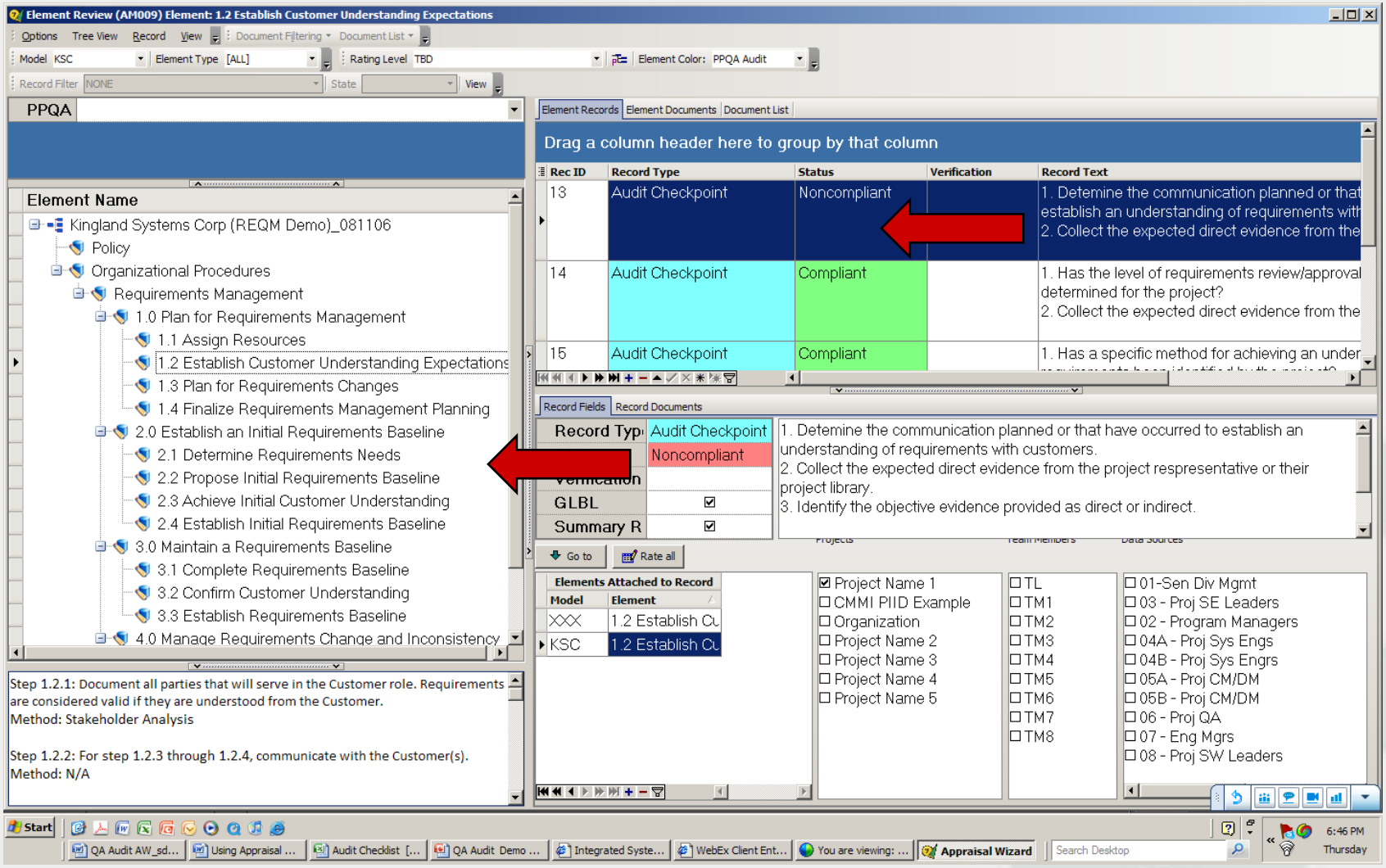


Audit Spreadsheet Generate and Re-import

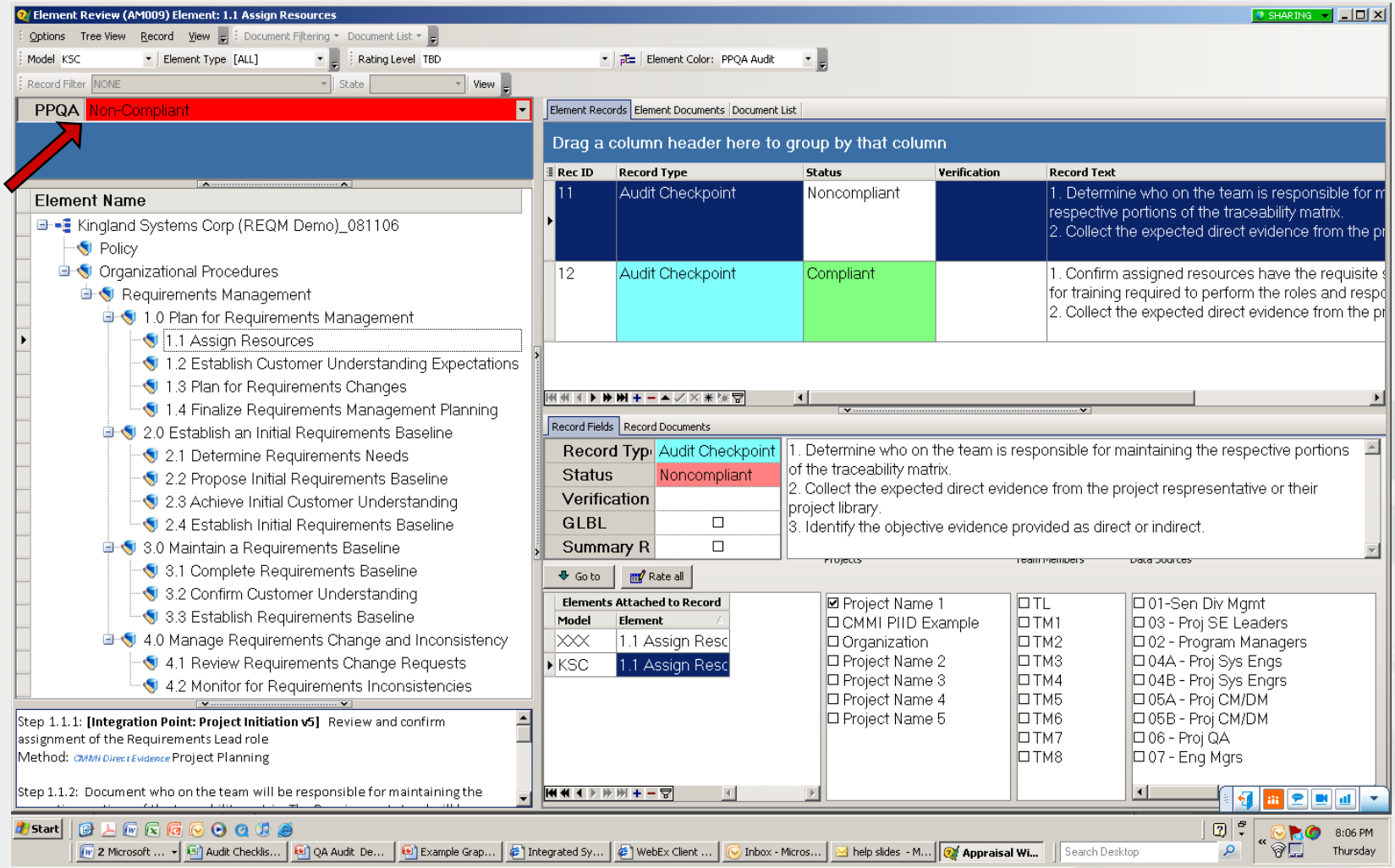


	A	B	C	D	E	F	G
1	ID	Audit Checklist	Type	Rec Status	Doc ID	Ev Type	Title
2	1495	1. Review and confirm assignment of the Requirements Lead role with the project representative . 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0001	Expected Direct Evidence	Project Planning Timeline
3	1497	1. Determine if the Customer responsible for requiremetns interface has been identified. 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0005	Expected Direct Evidence	Stakeholder Analysis
4	1499	1. Has the project documented the way it captures requirements change requests from the Customer and other stakeholders? 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0002	Expected Direct Evidence	Requirements Management Plan
5	1509	1. Determine who on the team is responsible for maintaining the respective portions of the traceability matrix. 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0002	Expected Direct Evidence	Requirements Management Plan
6					0004	Expected Indirect Evidence	Requirements Traceability Matrix
7	1510	1. Confirm assigned resources have the requisite skills or are planned for training required to perform the roles and responsibilities. 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0003	Expected Direct Evidence	CDP Assessments GeoLearning training rec
8	1511	1. Determine the communication that planned or those that have occurred for establishing an understanding of requirements with customers. 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0002	Expected Direct Evidence	Requirements Management Plan
9	1512	1. Has the level of requirements review/approval by the customer been determined for the project? 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0002	Expected Direct Evidence	Requirements Management Plan
10	1513	1. Has a specific method for achieving an understanding of requirements been identified by the project? 2. Collect the expected direct evidence from the project respresentative or their project library. 3. Identify the objective evidence provided as direct or indirect.	Audit Checklist Item	Candidate	0002	Expected Direct Evidence	Requirements Management Plan
11					0007	Expected Indirect Evidence	Notes from Customer(s)
12					0006	Expected Indirect Evidence	Meeting Minutes

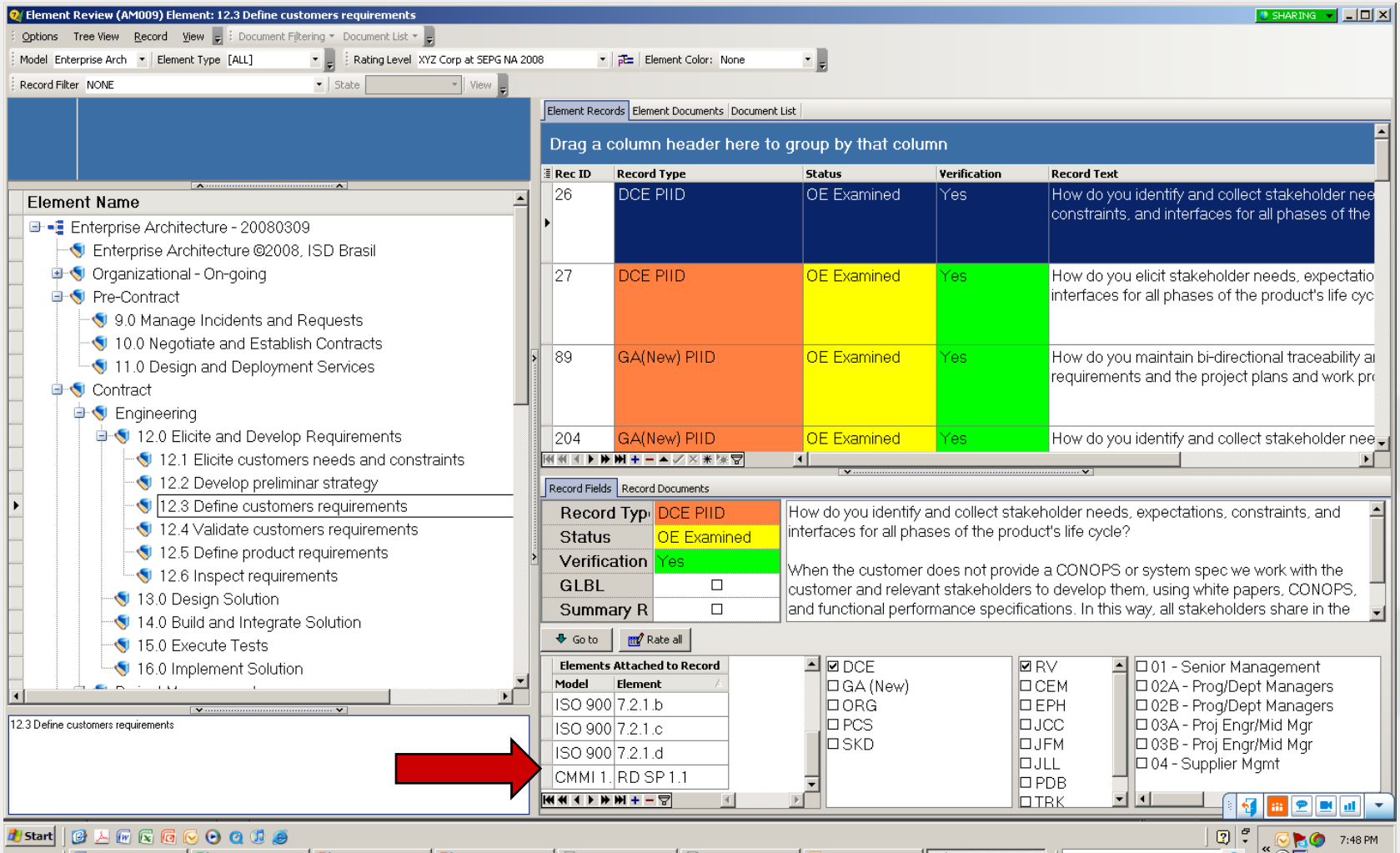
Determine Status of Records/Documents



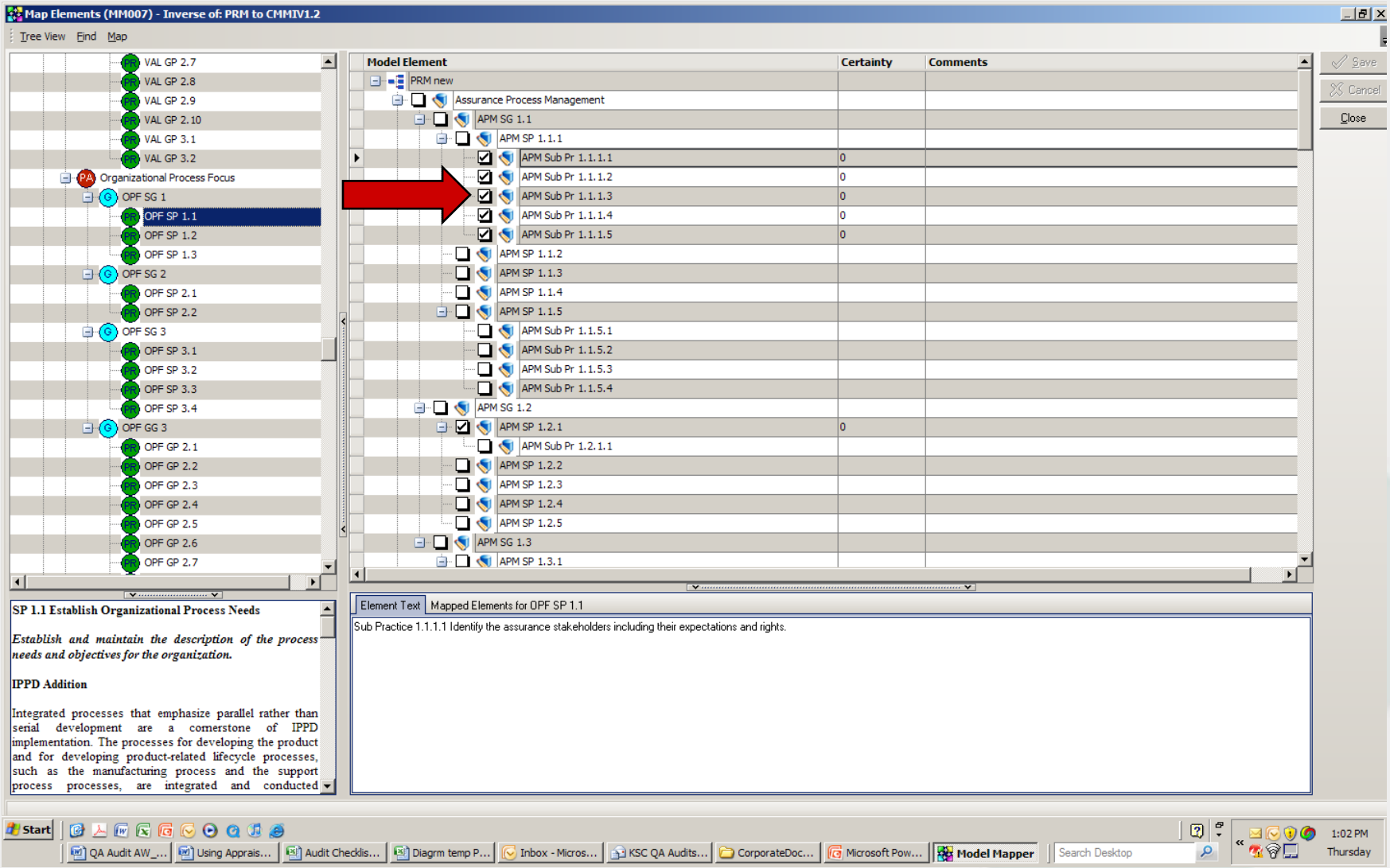
Determine Element Compliance Ratings



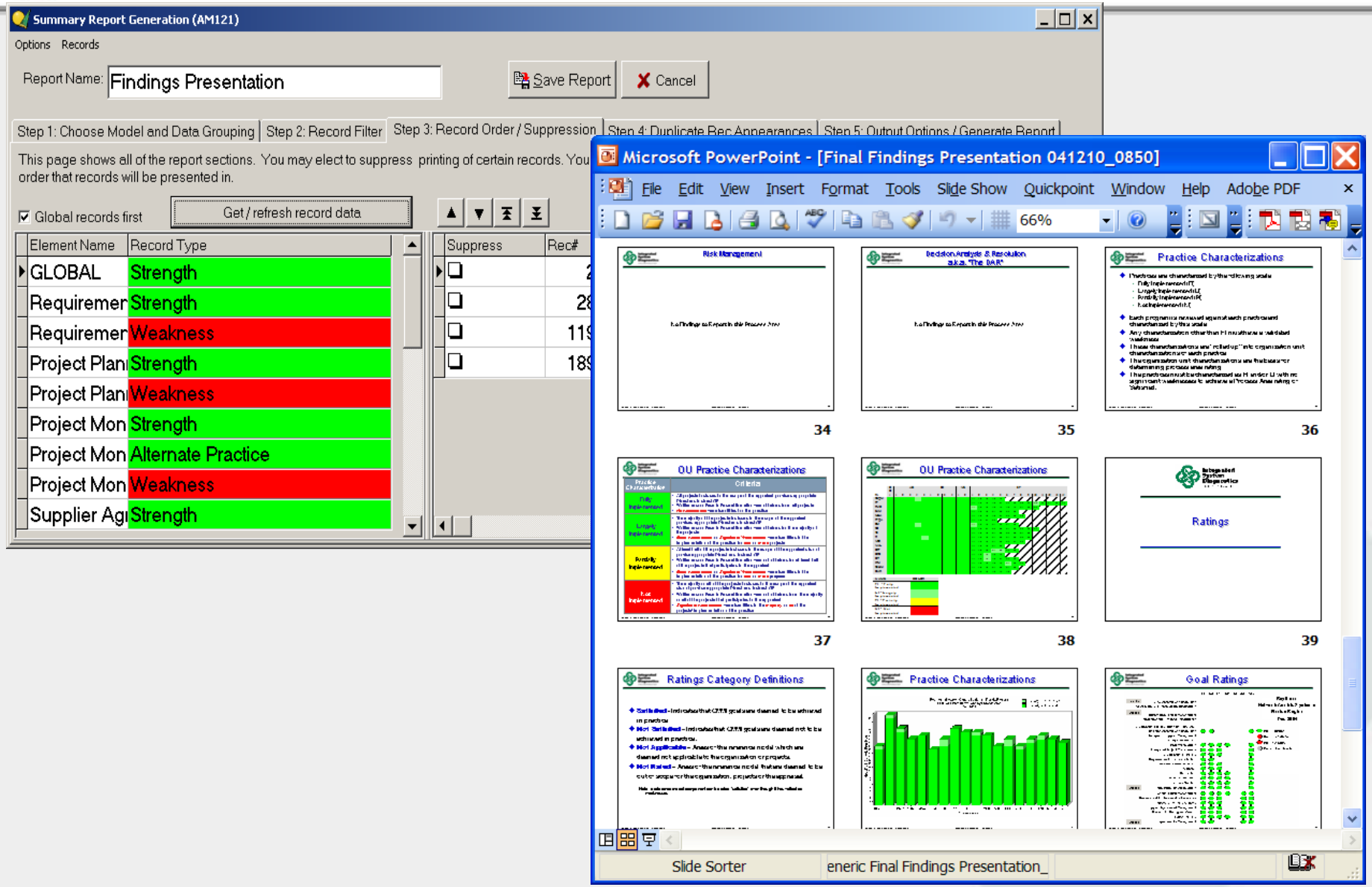
Audit Results and organization's existing data supports appraisals and ties to other standards/ models



CMMI-DEV 1.2 Mapped to QA Reference Model



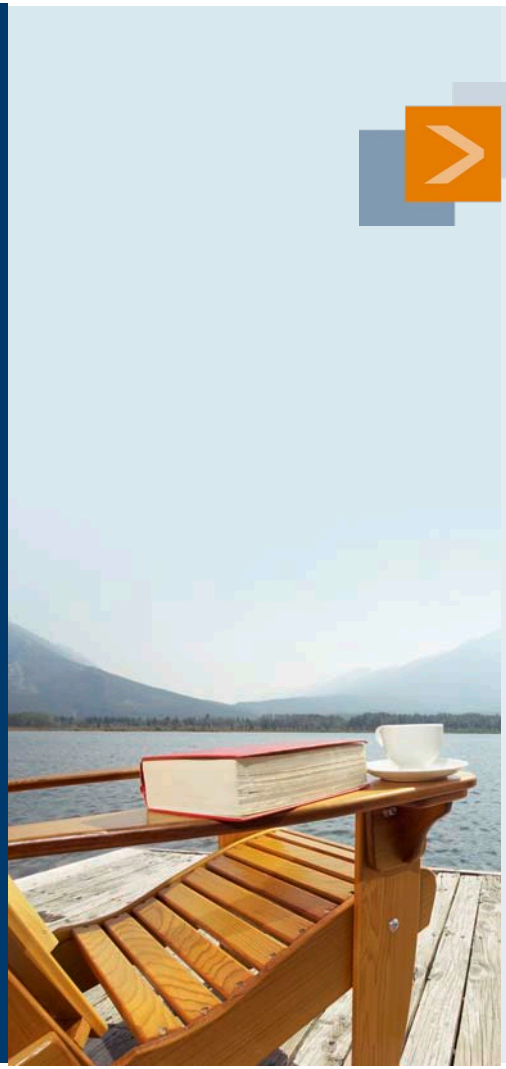
Generate Reports



Benefits

- Reduce complexity
  - Process descriptions become consistent and lean
  - No „CMMI or ISO speak“
  - Fulfill multiple standards in parallel
- Reduce efforts and costs
  - Companies reported up to 60% less efforts for audit preparations
  - No interruption of operational work because of audit preparations
- **Concentrate on process improvement, not process administration**

stages



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