



**EGEE'06
Industry Quality Standard**

CMMi lev.3 certification process within Engineering

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Engineering Ingegneria Informatica
Geneva, September 27th 2006**



Engineering Group

Territorial coverage

37 offices
3.700 staff
more than 800 clients
more than 400 business specialists

Business lines

System & Business Integration
Outsourcing

Services and Software Development
Technologies and Products
Consuntalcy
Logistics and Security
Training

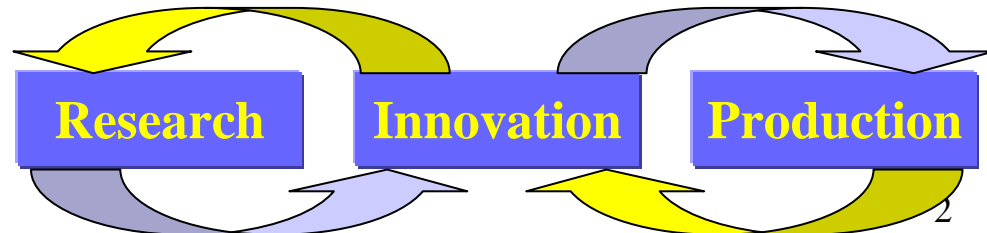
Engineering Ingegneria Informatica

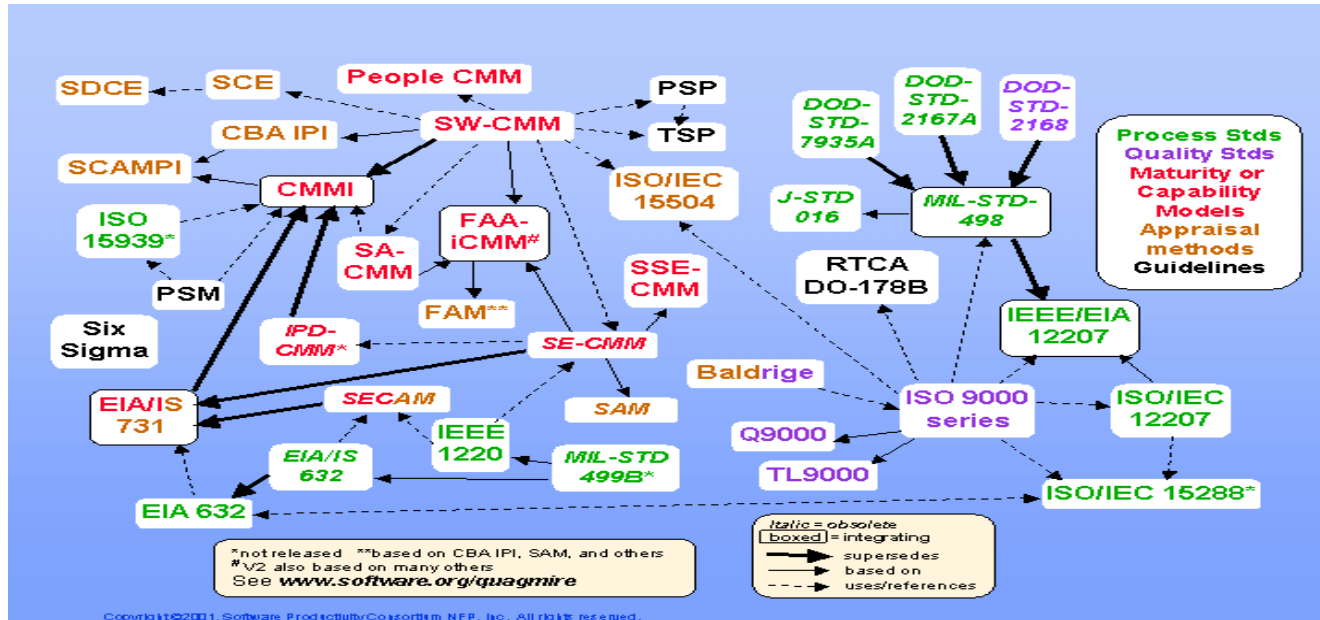
Market and process competences

Central and Local Public Administration
Finance
Defence
Healthcare
Industry Telecommunications & Services
Utilities
Security



Research & Innovation Division





The Frameworks Quagmire (www.software.org/quagmire)

QA certifications

- ISO 9001:2000 (from January 1994)
- NATO AQAP-2110/160 (from December 1996)
- Sw-CMM lev.2 - February 2005
- assessment CMMi lev.3 – (work in progress)

TO IMPROVE COMPANY PROFITS

▶ Market reputation

- CMMi certification is a distinctive factor in the whole IT market**
- CMMi certification is applicable to all Engineering divisions**
- In Italy CMMi certification is restricted to few first-class companies**
- Italian Public Administration value CMMi certification**

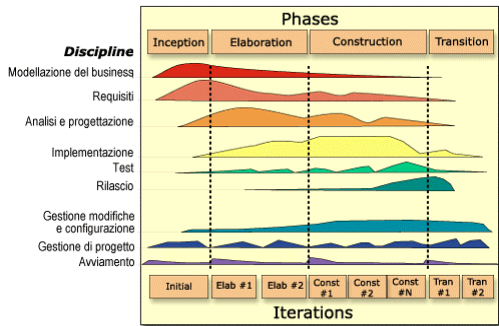
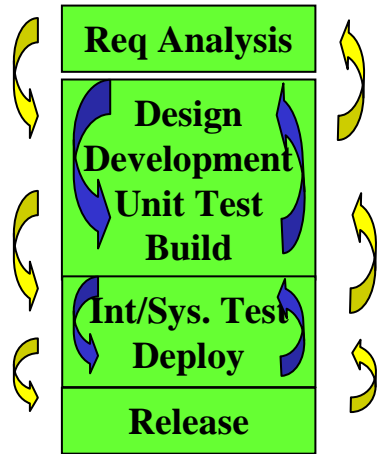
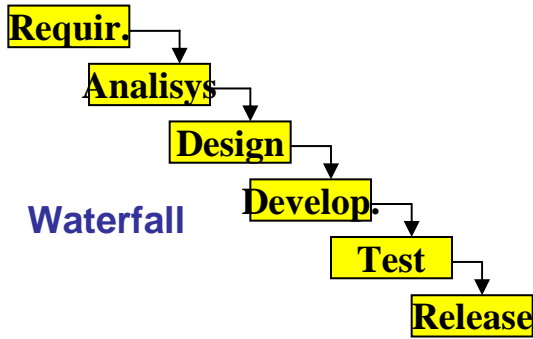
▶ Company effectiveness

- Software projects teams can systematically achieve their own goals using software development processes that are:**
 - well known inside the company and repeatable**
 - controlled and optimized**

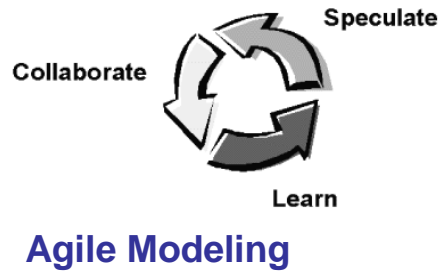
CMMi within Engineering

Complexity to solve

Several software development processes



Unified Process



Several languages



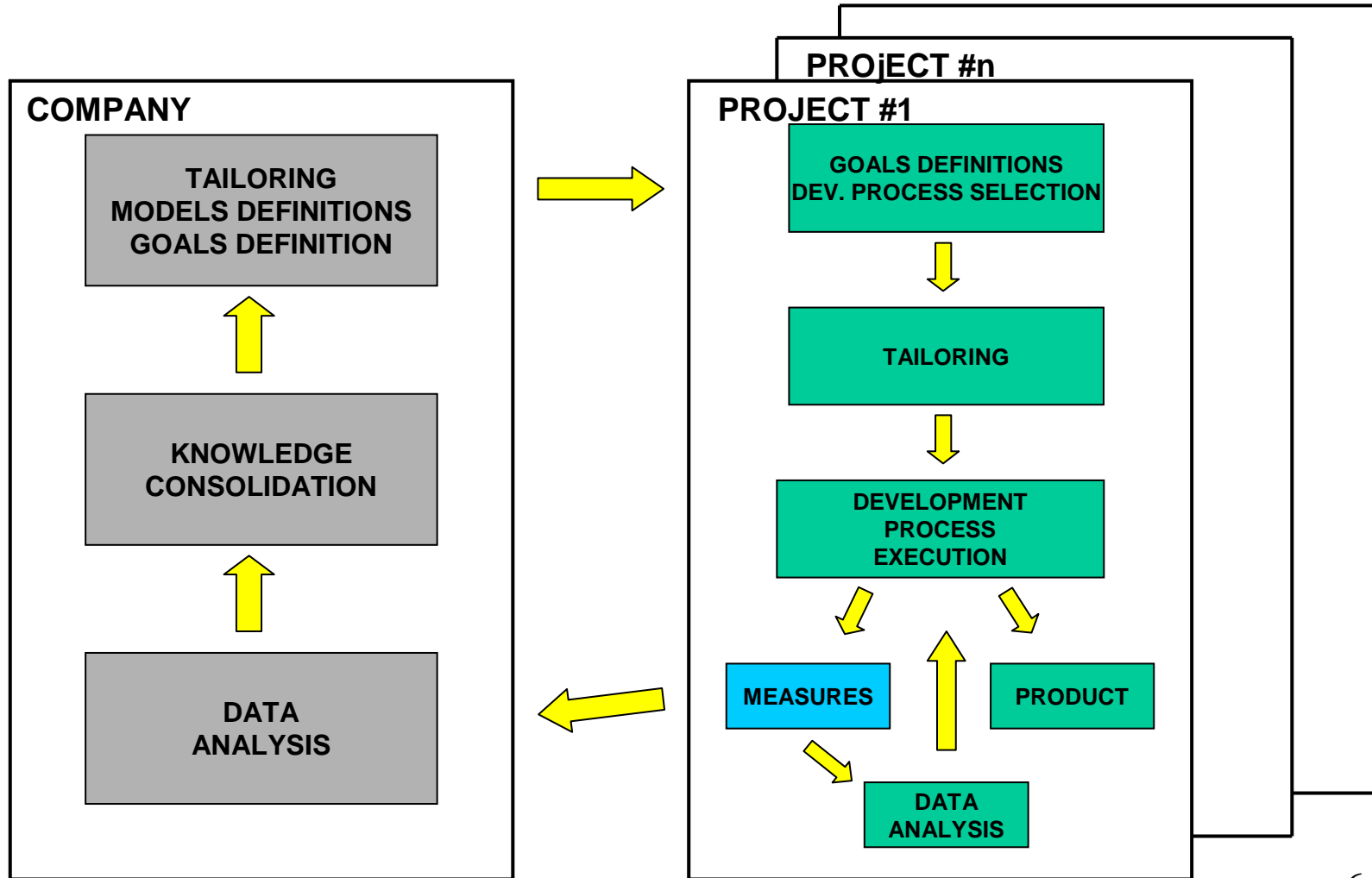
Cobol

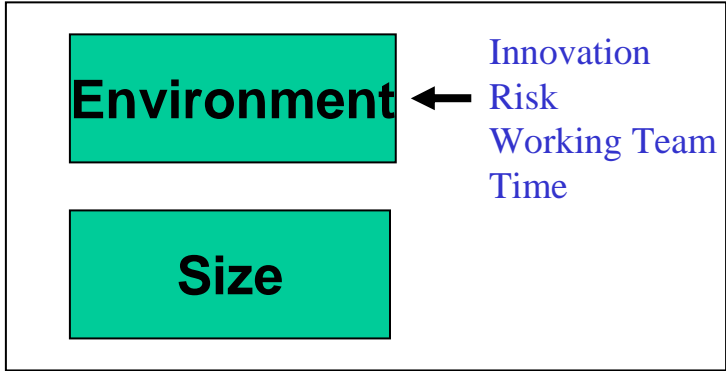
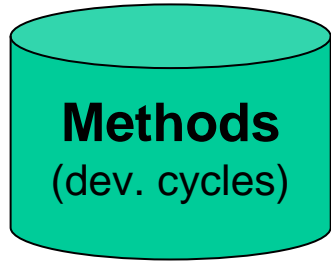
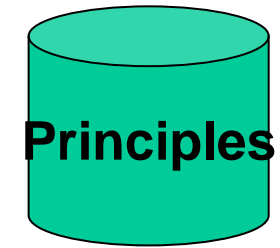
Several technological environment

Web Client Server Legacy

Several process competences & market approaches

Model at the source





CMMi within Engineering

Organization

Planning & Control Dept.

SEPG
software engineering
process group

Quality Assurance Department

A working group cross to all Company divisions:

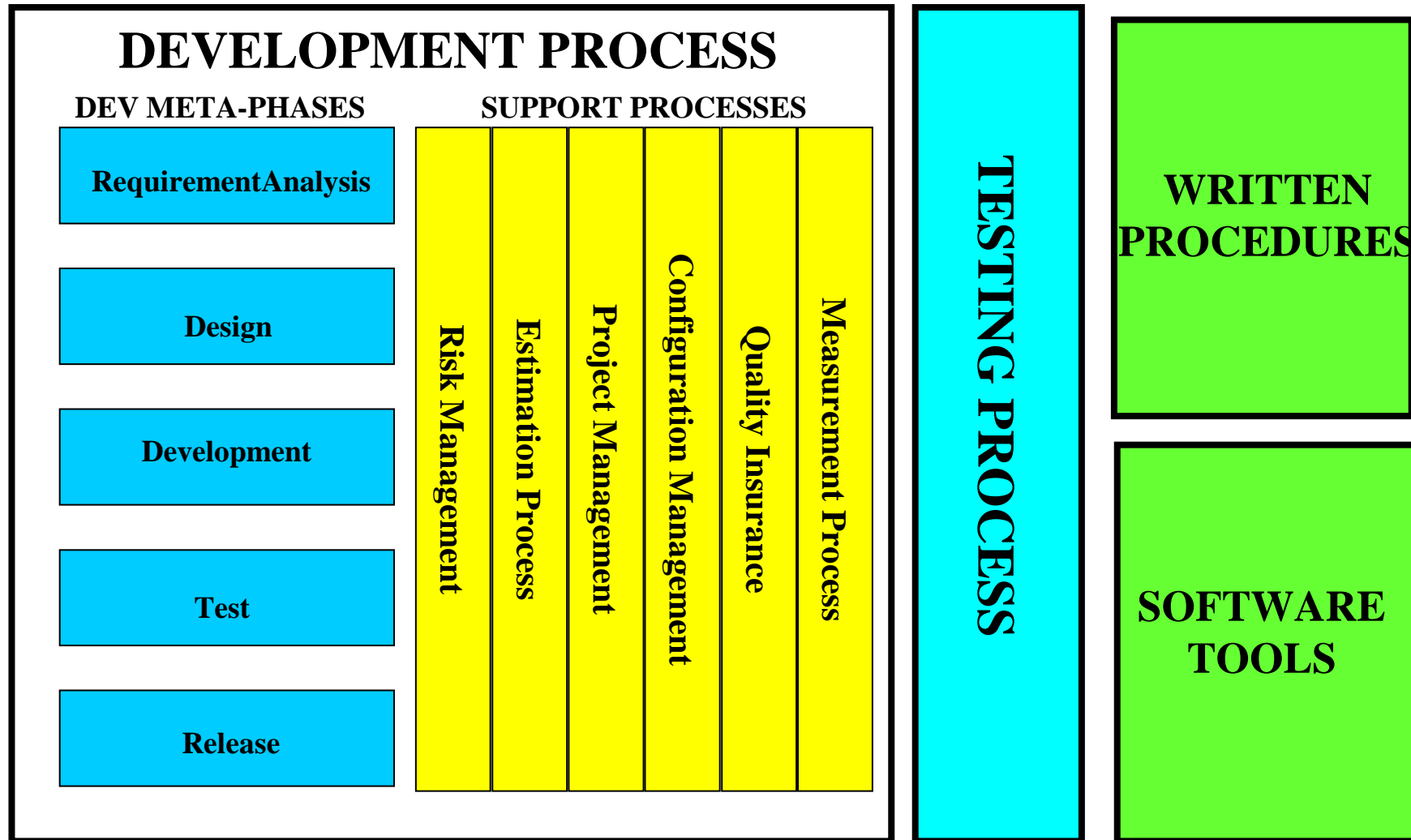
- design, implementation and support of new solutions
- training & tutoring

SW-CMM liv.2 practices dissemination (within the Company)

8 CMMi liv.3 Pilot Projects :

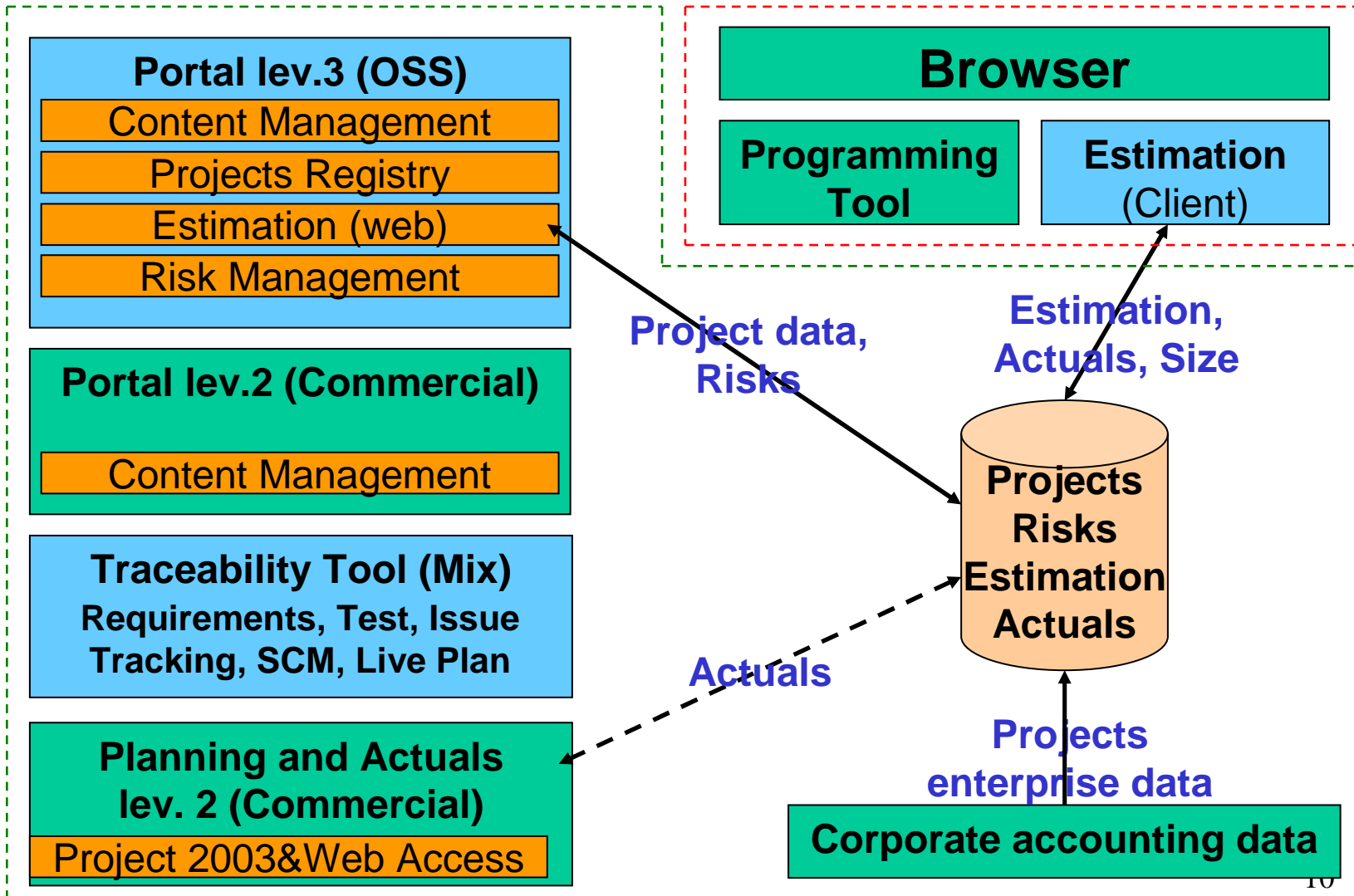
- representative of Engineering market and process competences
- representative of Engineering operating scenario
- first adopters of new best practices

Certification Authority (assessment)

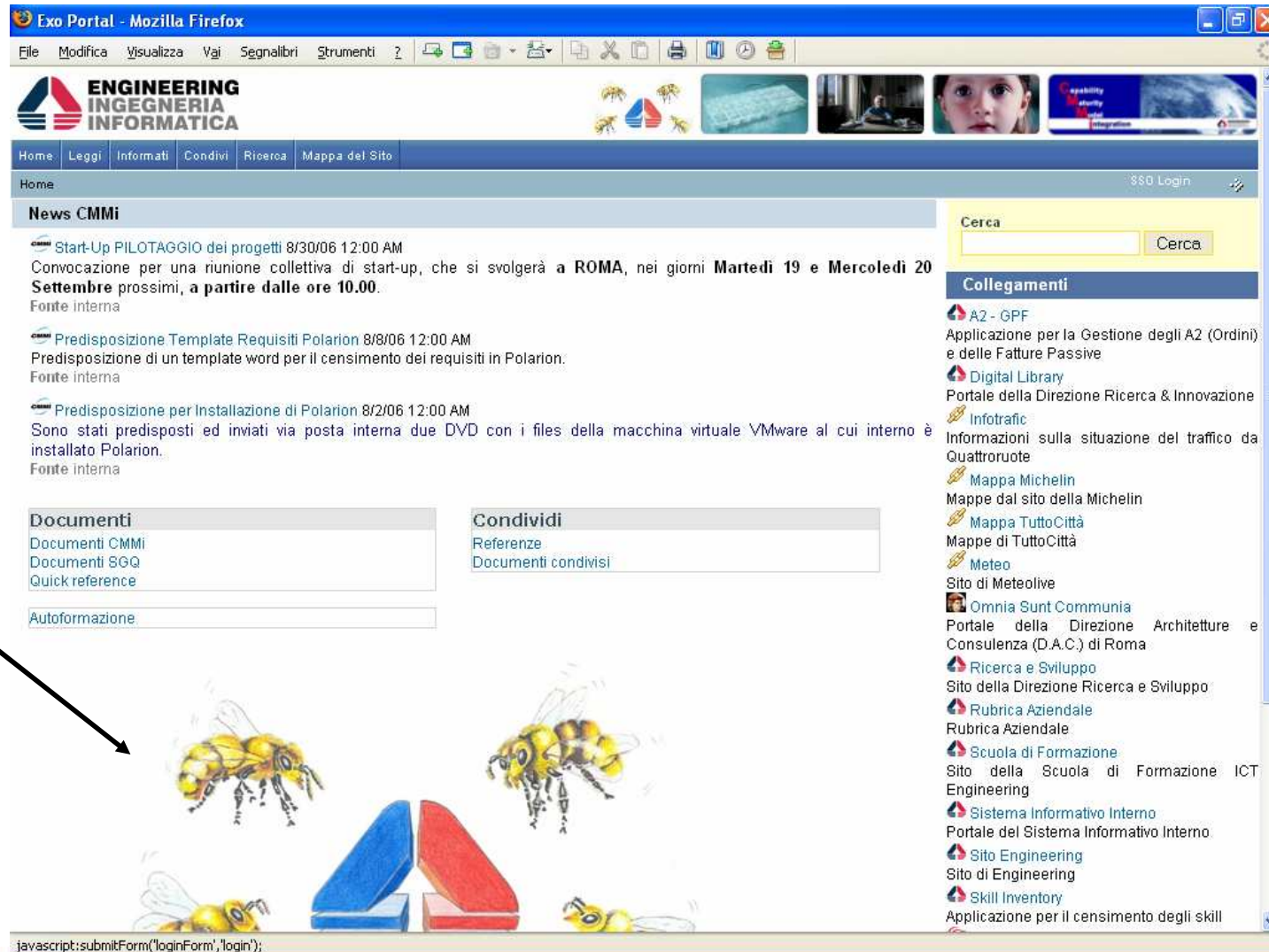


CMMi within Engineering

Infrastructure: general approach



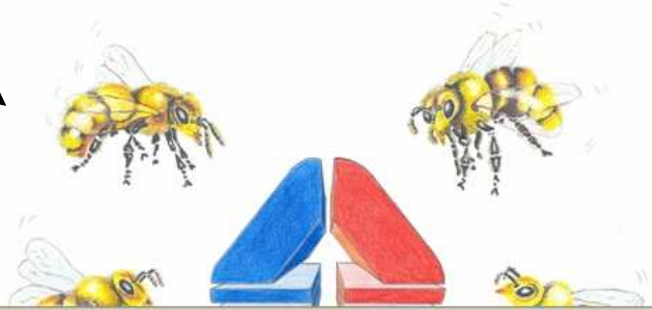
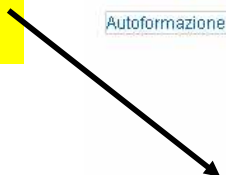
API: Access Point to Information



The screenshot shows the 'Exo Portal - Mozilla Firefox' browser window. The page content includes:

- News CMMi:**
 - Start-Up PILOTAGGIO dei progetti 8/30/06 12:00 AM: Convocazione per una riunione collettiva di start-up, che si svolgerà a ROMA, nei giorni **Martedì 19 e Mercoledì 20 Settembre** prossimi, a partire dalle ore 10.00. Fonte interna
 - Predisposizione Template Requisiti Polarion 8/8/06 12:00 AM: Predisposizione di un template word per il censimento dei requisiti in Polarion. Fonte interna
 - Predisposizione per Installazione di Polarion 8/2/06 12:00 AM: Sono stati predisposti ed inviati via posta interna due DVD con i files della macchina virtuale VMware al cui interno è installato Polarion. Fonte interna
- Documenti:**
 - Documenti CMMi
 - Documenti SGQ
 - Quick reference
 - Autoformazione
- Condividi:**
 - Referenze
 - Documenti condivisi
- Collegamenti:**
 - A2 - GPF: Applicazione per la Gestione degli A2 (Ordini) e delle Fatture Passive
 - Digital Library: Portale della Direzione Ricerca & Innovazione
 - Infotrafic: Informazioni sulla situazione del traffico da Quattroruote
 - Mappa Michelin: Mappe dal sito della Michelin
 - Mappa TuttoCittà: Mappe di TuttoCittà
 - Meteo: Sito di Meteolive
 - Omnia Sunt Communia: Portale della Direzione Architetture e Consulenza (D.A.C.) di Roma
 - Ricerca e Sviluppo: Sito della Direzione Ricerca e Sviluppo
 - Rubrica Aziendale: Rubrica Aziendale
 - Scuola di Formazione: Sito della Scuola di Formazione ICT Engineering
 - Sistema Informativo Interno: Portale del Sistema Informativo Interno
 - Sito Engineering: Sito di Engineering
 - Skill Inventory: Applicazione per il censimento degli skill

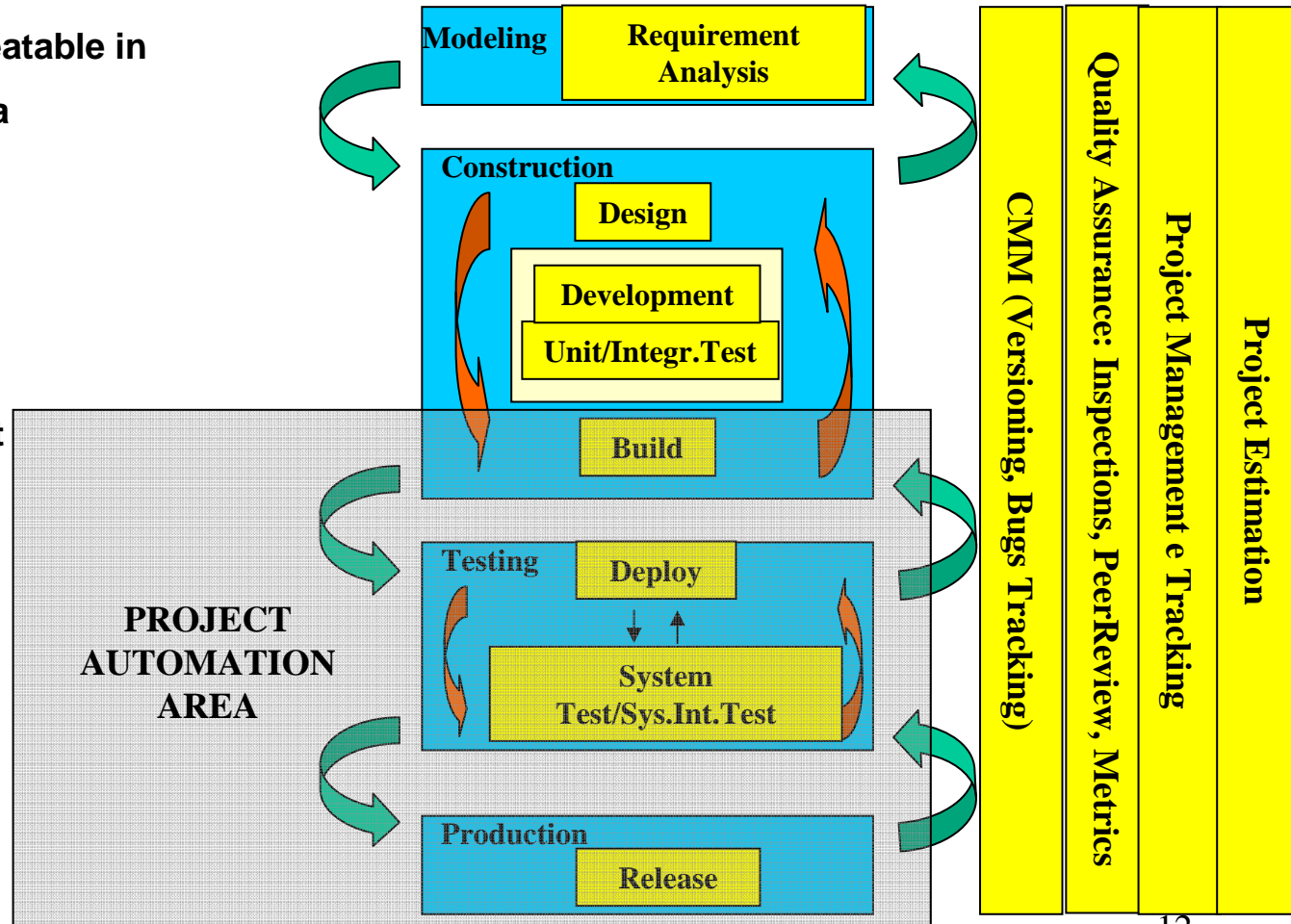
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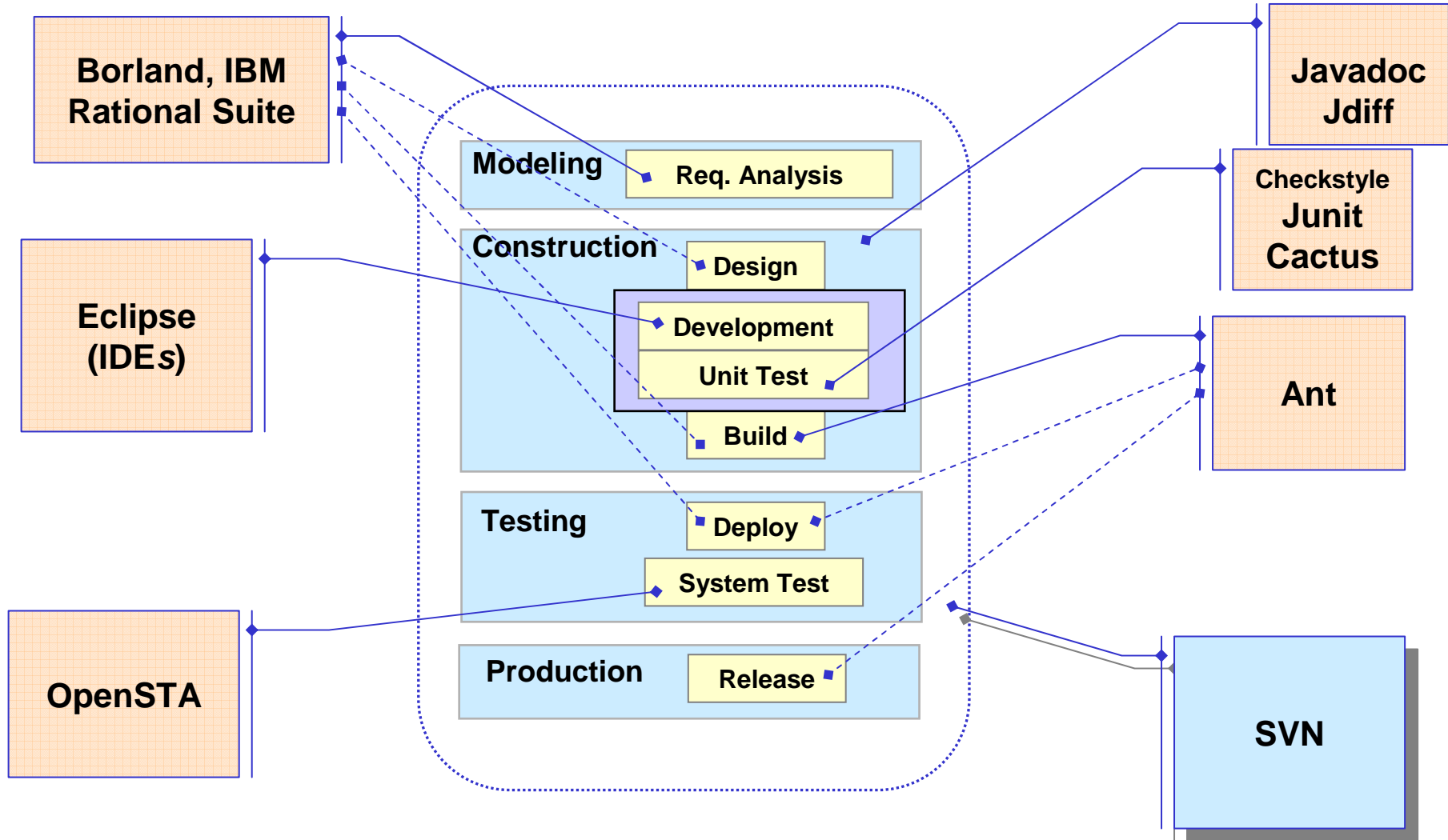
Project Automation

Automatic execution of critical and repetitive phases (or repeatable in an automatic way) within a development process:

- Build Process
- Automatic Unit Testing
- Deploy
- Automatic System Test
- Release



Mainly open source tools



8 PILOT PROJECTS

Support experienced consultants (estimation, prj mgt, infrastructure, ...):

- On demand

Tutors:

- Tutoring every 15 days
- To support software and non-software tools adoption
- To plan and monitor the CMMi project operating program
- To research and record tracks: PIIDB (Practice Improvement Indicators DB)
- Definition of improvements actions

Auditor:

- Audit every 30 days
- To monitor the progress of the development and CMMi learning processes
- Process strength and weaknesses verification
- To monitor the PIIDB implementation
- To record issues and to report the audit

Goal Question Metric approach

A response to a specific question to achieve a pre-defined goal:

- key question**
- indicator (to answer the question)**
- algorithm (to compute the indicator)**
- algorithm definition**
- acquired benefit**

G-Q-M approach: issue tracking

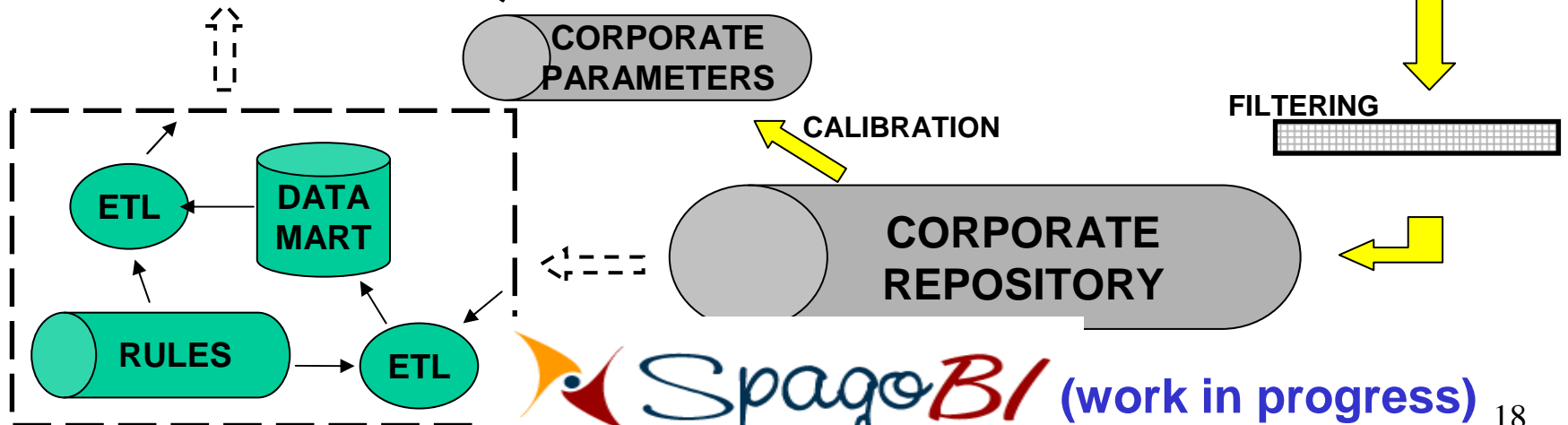
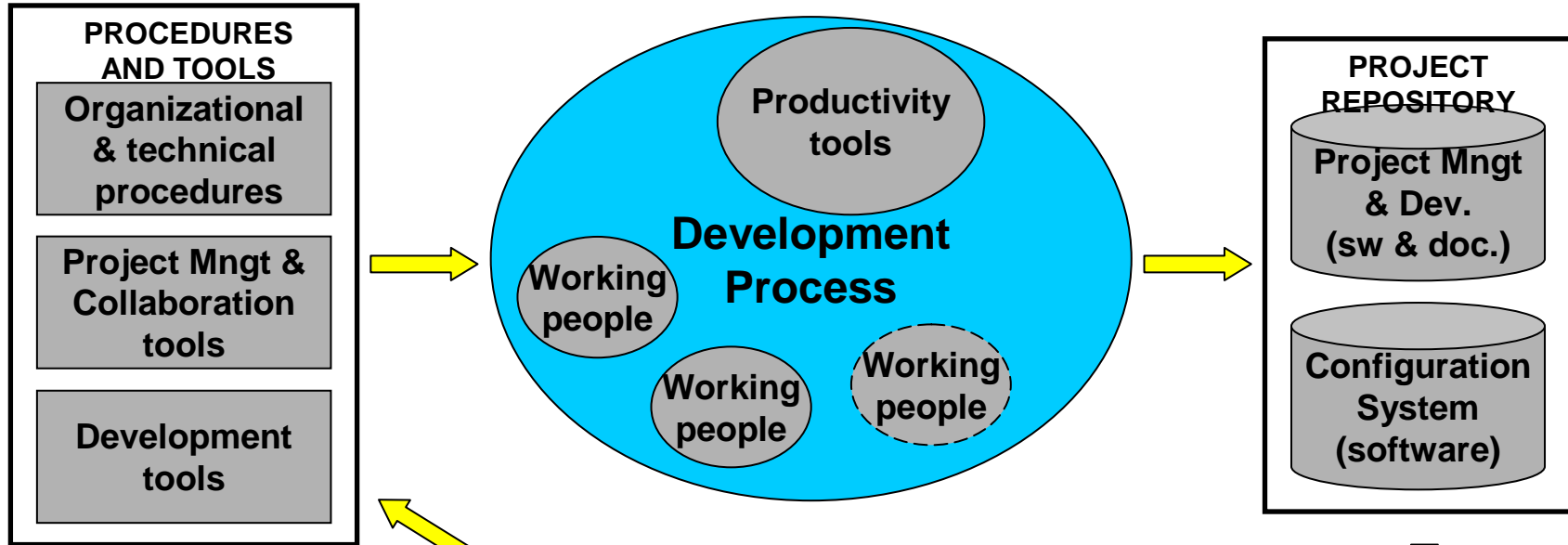
QUESTION	INDICATOR	ALGORITHM	DEFINITION	BENEFIT
How long is the issue resolution time?	Issue resolution rate	IRT = number of closed issues/total days spent to close the issues	Number of closed issues: ... Total days spent to close the issues:	Estimation of testing completion. Efficiency/Effectiveness of issue resolution process
How often issues arises?	Issue emergence rate	IER = number of detected issues /number of days spent in testing	Number of detected issues: ... Number of days spent in testing: ...	Measure of: <ul style="list-style-type: none"> • quality of design and coding. • quality of testing • testers' performance
How long is the issue lifetime?	Average issue lifetime	AIL = total days spent to close issues/number of solved issues	Total days spent to close issues: ... Number of solved issues: ...	Estimation of testing completion. Efficiency/Effectiveness of issue resolution process

Issue tracking: CMMI indicators

Information Sources	Organisational Goals	Operative Goals	Indicators	Description of the basic measurement
Issue Tracking & non-compliance management	To lower amount of process non-compliances referring to corporate policy and procedures	Identify where and when intervene to prevent/resolve issues in project development	Distribution of non-compliances gathered in QA audits.	Number of non-compliances gathered in a time period, by issue category.
Issue Tracking & non-compliance management	To resolve the process non-compliances referring to corporate policy and procedures	Monitor the timely and correct resolution of gathered non-compliances.	Status of non-compliances gathered in QA audits referring to their initial status	(1) Number of non-compliance in a 1-year period: (2) still open (2.1) not resolved in time (3) closed (3.1) within the pre-defined time-limit (3.2) after the pre-defined time-limit (3.3) re-opens (in new audits) (4) Number of reminders sent to projects

CMMi within Engineering

M&A: infrastructure



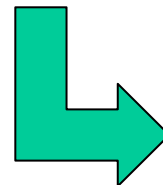
SpagoBI (work in progress)

CMMi within Engineering

Conclusion

Beyond market reputation; main technical benefits:

- a “new focus” in development process
- dissemination of best practices (all dev. processes)
- more standard and less ad-hoc development
- project automation improvement
- realization of the corporate development infrastructure
- starting to systematically measure and analyze processes and products development
- improvement of the organization (specialists, consultants, auditors) supporting critical projects



beyond CMMi