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(SM^{CMM}) : Software Maintenance Capability Maturity Model

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Need for SM-^{CMM}

- CMM and CMMi focus
  - Software Development and Maintenance **Projects**
  - Teams of developers
- Software Maintenance Specific Processes (SWEBOK) ?
  - Transition
  - Service Level Agreements
  - Acceptance/Rejection of Change and Corrective Requests
  - Planning Maintenance activities
  - Supporting operational software

What current models could help ?

Year	Software Engineering CMM proposals
1991	Bootstrap
1992	***Trillium*** **(Nortel)**
1993	Software Engineering Institute CMM
1994	***Camélia***, Automated Testing (Kra94)
1996	Burnstein Testing Maturity Model, **Zit96**, Dov96
1997	Som97
1998	Esi98, Top98, Baj98
1999	Wit99, Vet99, Sch99
2000	**Cob00**, Str00, Bev00, Lud00
2001	**Kaj01d & 01e**, Ray01, Sch01, Luf01, Tob01, Sri01
2002	**Sei02**, **Nie02**, Mul02, Vee02, Pom02, Raf02, Sch02, Ker02, Cra02

Sources to build SM-CMM:
Standards

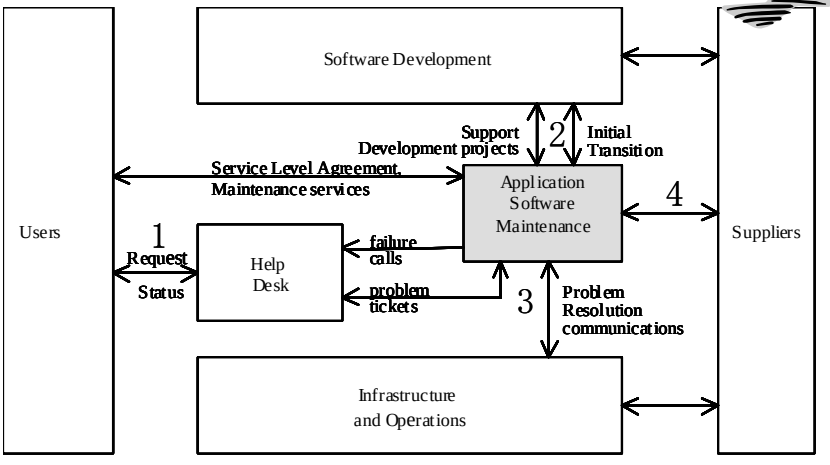
- ISO/IEC TR 15504 part 2 (Spice)
- ISO12207
- ISO14764
- IEEE1219
- ISO 9003:2004

Sources to build SM-CMM:

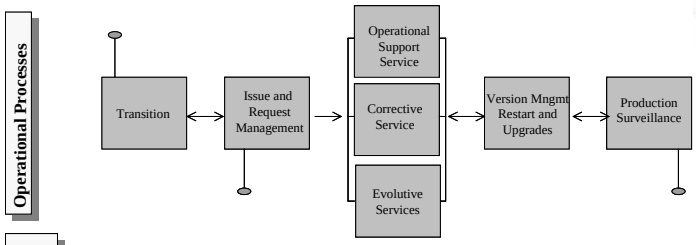
Maturity models and best practice guides

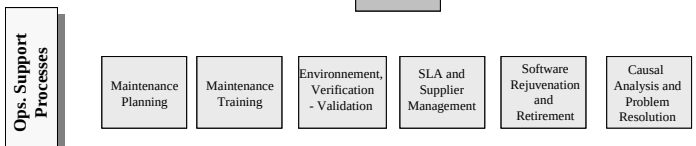
- CMMi for software [Sei02];
- Zitouni/Abran software maintenance model [*Zit96*];
- Camélia software product capability model [*Cam94*];
- Cm3- Corrective Maintenance Model by Kajko-Mattsson
- IT Service CMM [*Nie02*] ;
- CobIT Internal auditors maturity model [*Cob00*];
- Malcolm-Baldrige [*Mal03*] ;

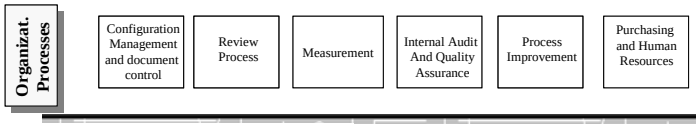
Model Context (Scope)



SM-CMM Process model







SMCMM Architecture by levels

- Domains
  - Key Process Areas
    - Maturity Levels
      - Roadmaps
      - Best Practices

SM^{CMM} – Alignment to CMMi

CMMi Process Domains	SM^{CMM} Process Domains
Process Management	Process Management
Project Management	Maintenance Request Management
Engineering	Evolution Engineering
Support	Support to Evolution Engineering

SM^{CMM} – Resulting KPA's

4 Process domains of software maintenance	Key Process Areas of Software Maintenance
Process Management	1- Maintenance Process Focus 2- Maintenance Process/Service definition 3- Maintenance Training 4- Maintenance Process Performance 5- Maintenance Innovation and deployment
Maintenance Request Management	1- Request & Event Management 2- Maintenance Planning 3- Monitoring & Control of maintenance requests 4- SLA & Supplier Management 5- Quantitative Maintenance Management
Evolution Engineering	1- Transition 2- Operationnal Support 3- Evolution & Correction of software 4- Verification and Validation
Support to Evolution Engineering	1- Configuration Management 2- Process and Product Quality Assurance 3- Measurement, Decision Aanalysis 4- Problem Management and Causal Analysis 4- Rejuvenation/Retirement Engineering

SM^{CMM} – Maturity Levels

Level	Level Name	Risk	Interpretation
0	Non-existent	Highest	no sense of process
1	Initial	Very high	ad hoc maintenance process
2	Repeatable	High	basic request-based process
3	Defined	Medium	state-of-the-art process
4	Managed	Low	generally difficult to achieve now
5	Optimized	Very low	technologically challenging to attain

SM^{CMM} – Roadmaps

Example for one Domain: **Evolution Engineering**

Key process area: Transition

Roadmaps:

- Communication with the developer
- Follow the transition process
- Control of knowledge transfer during transition
- Prepare documentation & software transfer
- Participate in system and acceptance tests

SM^{CMM} in summary

- Model in numbers
  - 4 Process Domains
  - 18 KPA'a
  - 74 Roadmaps
  - 443 Practices with supporting text and references
- Public Domain soon !

Future Work

- Release in a French Book during 2005
- Release as part of a Phd Thesis in 2005
- Knowledge Based system to support training is planned to start during 2005
- Will be posted on our WEB site progressively during 2005 at http://www.lrgl.uqam.ca/

Thank You