

(SM^{MM}) :
Software Maintenance Maturity Model

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Need for SM-^{MM}



- ❖ 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



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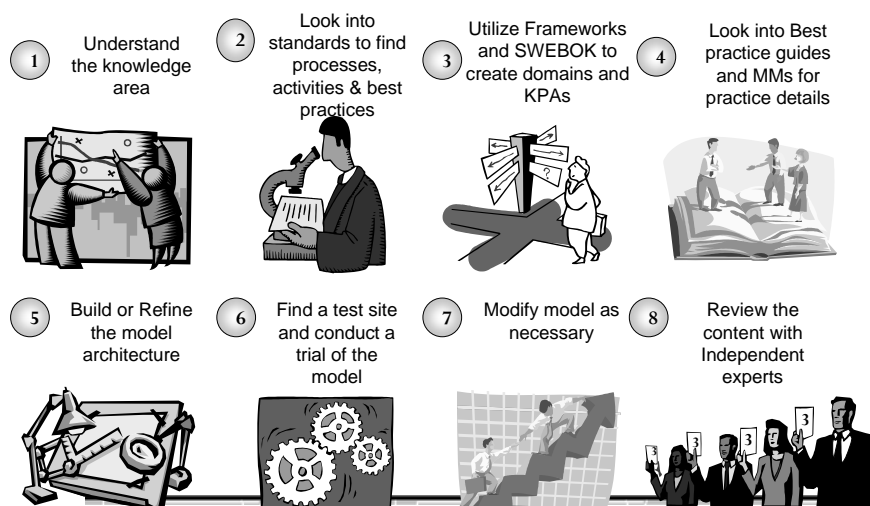
What current MM could help?



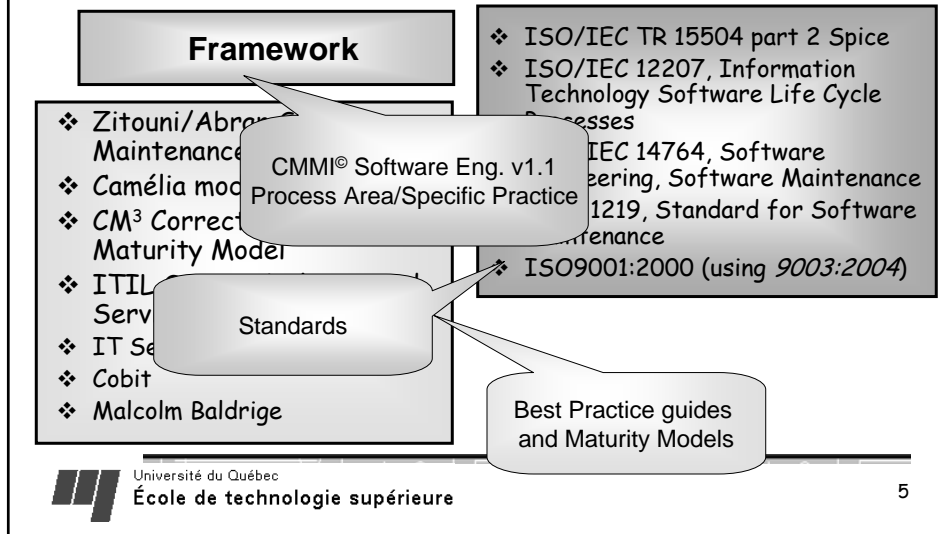
Year Software Engineering MM proposals

1991	Bootstap
1992	Trillium
1993	CMM®
1994	Camélia , automated testing (Kra94)
1996	TMM (Bur96), 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	CMMi® , Nie02, Mul02, Vee02, Pom02, Raf02, Sch02, Ker02, Cra02

Step by step build SM-MM



Sources to build SM-MM:



Use of CMMi structure in SM-MM:



- ❖ Contains the essential elements of effective processes for software related activities
- ❖ Contains a framework that provides the ability to generate multiple models and associated training and assessment materials.
- ❖ Provides guidance when developing processes
- ❖ Describes evaluation methods
- ❖ Well known and deployed in industry

Source P.Croll: 14th Annual DoD Software Technology Conference - IEEE-Sponsored Track - 1 May 2002

Referenced standards in SM-MM



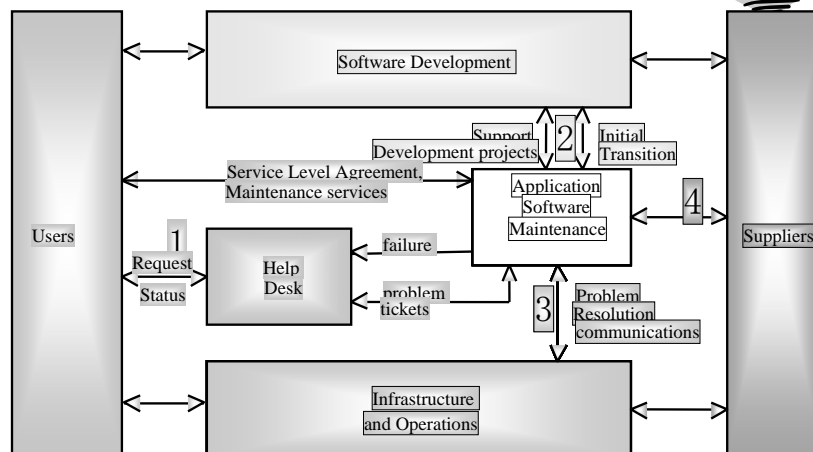
Standards, are consensus-based documents that codify best practice. Consensus-based standards have seven essential attributes that aid in process engineering. They:

- represent the collected experience of others who have been down the same road,
- tell in detail what it means to perform a certain activity,
- can be attached to or referenced by contracts,
- help to assure that two parties have the same meaning for an engineering activity,
- increase professional discipline,
- protect the business and the buyer,
- improve the product.

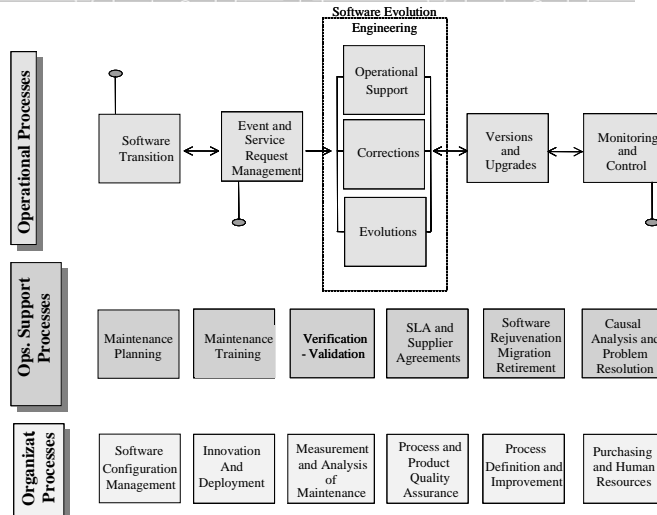
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Model Context (Scope)



SM-MM Process model



SM^{CMM} - Alignment to CMMi



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

SM^{MM} - Resulting KPA's



SM ^{MM} Process Domains	Key Process Areas of Software Maintenance
Process Management	<ol style="list-style-type: none"> 1- Maintenance Process Focus 2- Maintenance Process/Service definition 3- Maintenance Training 4- Maintenance Process Performance 5- Maintenance Innovation and deployment
Maintenance Request Management	<ol style="list-style-type: none"> 1- Request & Event Management 2- Maintenance Planning 3- Monitoring & Control of maintenance requests 4- SLA & Supplier Management 5- Quantitative Maintenance Management
Evolution Engineering	<ol style="list-style-type: none"> 1- Transition 2- Operational Support 3- Evolution & Correction of software 4- Verification and Validation
Support to Evolution Engineering	<ol style="list-style-type: none"> 1- Configuration Management 2- Process and Product Quality Assurance 3- Measurement, Decision Analysis 4- Problem Management and Causal Analysis 5- Rejuvenation/Retirement Engineering



SM^{MM} Architecture by levels



- ❖ Domains
 - ❖ Key Process Areas
 - ❖ Maturity Levels
 - ❖ Facets
 - ❖ Best Practices



SM^{MM} - Maturity Levels



Level	Level Name	Risk	Interpretation
0	Non-Existent	highest	no sense of process
1	Initial	Very high	ad-hoc maintenance
2	Repeatable	High	basic request-based
3	Defined	Medium	state of the art
4	Managed	Low	advanced measures
5	Optimized	Very Low	advanced improv.



SM^{MM} - Facets



A domain

its KPAs

Evolution Engineering

- 1- Transition
- 2- Operational Support
- 3- Migration & Correction of software
documentation and Validation

its Facets describe different aspects of a KPA

- 1) Communications with the developer, the owner and the purchasing agent.
- 2) Management of the transition process.
- 3) Control of training and knowledge transfer during transition
- 4) Prepare documentation transfer (includes source code and outstanding problem reports)
- 5) Participate in user and acceptance tests



SM^{MM} in summary



- ❖ Model in numbers
 - ◆ 4 Process Domains
 - ◆ 18 KPA's
 - ◆ 74 Facets
 - ◆ 443 Practices with supporting text and references
- ❖ Public Domain soon !



Future Work



- ❖ Evaluation tool : in progress
- ❖ Knowledge Based system to support understanding and training is planned to start during 2004
- ❖ Model details will be posted on our WEB site progressively during 2004/5



For more information . . .

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For SWEBOK: <http://www.swebok.org/>

For our research lab.: <http://www.lrgl.uqam.ca/>

For ISO/IEC Standards: <http://www.jtc1-sc7.org>



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Questions?



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