March 3, 2020

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MEASURING PROCESS CAPABILITY VERSUSORGANIZATIONAL PROCESS MATURITY

Research Paper



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**ABSTRACT**

The Software Engineering Institute’s Capability Maturity Model for Software has popularized the notion of measuring the software process maturity of organizations. Based on the ISO standard, an organization’s process maturity is measured by establishing base and extended process sets at each stage of maturity. These base and extended process sets are tailored based on the domain and scope of the assessment and/or client-specific requirements. One of the objectives is to create a way of measuring process capability, while not using a specific approach such as the SEI’s maturity levels. The approach selected is to measure the implementation and institutionalization of specific processes; a process measure rather than an organization measure. Maturity levels can be viewed as sets of process profiles using this approach. This paper discusses the process capability levels and while each organization has different starting points, different goals and objectives, and different levels of capability/maturity.

**Problem Definition:**

**What is CMM ?**

CMM also known as the capability maturity model refers to the various measures and techniques adopted by the companies which are intended to help the software organizations in improving the maturity of the software model in terms of evolutionary paths and from ad hoc, chaotic processes to mature, disciplined software processes.

**Maturity levels of CMM:**

Initial Level: The software process is characterized as ad hoc and chaotic.

Repeatable Level: Basic project management level to calculate track cost schedule, functionality and management.

There are some key there are some key processes involved in the repeatable level which focus on concerns related to establishment of basic project managerial controls. These concerns are listed below:

* Requirement management (RM)
* Software project planning (PP)
* Software planning oversight and tracking (PT)
* Software subcontract management (SM)
* Software quality assurance (SQ)
* Software configuration management (CM)

Defined Level: the software at both level, management and engineering activities, is documented, standardized and integrated into a standard software process.

The key processes at the defined level Address for the project and organizational issues. They ensure effective project engineering and management across all the processes: They are the following:

* Organizations Process focus (PF)
* Organizations Process Definition (PD)
* Training Program (TP)
* Integrated Software Management (IM)
* Software product engineering (PE)
* Intergroup Coordination (IC)
* Peer Reviews (PR)

Managed Level: Detailed measures which are quantitative in in Nature are collected for the software processes and products.

Optimizing level: continuous process improvement is enabled by quantitative feedback and the processes from piloting innovative ideas and technologies.

The key processes at the optimizing level cover both the organization and the continuous measurable software processes. They are the following:

* They are Defect Prevention (DP)
* Technology Change Management (TM)
* Process Change Management (PC)

Accessing process Capability in the BPG:

The BPG categorizes processes into five process areas. The Customer-Supplier process area consists of processes that directly impact the customer, support development and transition of the software to the customer, and provide for its correct operation and use. The Engineering process area consists of processes that directly specify, implement, or maintain a system and software product and its user documentation.

Capability Levels, Common Features, and Generic Practices in the BPG. Capability Level Common Feature Generic Practice

**Level 0 Not-Performed**

**Level 1 Performed-Informally** Base Practices are Performed Perform the process **Level 2 Planned-and-Tracked** Planning Performance Allocate resources Assign responsibilities. Document the process Provide tools Ensure training Plan the process

*Disciplined Performance* Use plans, standards, and procedures Do configuration management

**Tracking and Verifying Performance** *Verify process compliance.* Audit work products Track with measurement. Take corrective action.

**Level 3 Well-Defined**  Defining a Standard Process Standardize the process Tailor the standard process Performing the Defined Process Use a well-defined process Perform peer reviews Use defined data

**Level 4 Quantitatively-Controlled** *Establishing Measurable Quality Goals* Establish quality goals *Objectively Managing Performance* Determine process capability Use process capability

**Level 5 Continuously-Improving** *Establishing Process Effectiveness Goals.* Establish process effectiveness goals. Continuously improve the standard process. *Improving Process Effectiveness.* Continuously improve the defined process. Preventing Defects. Perform causal analysis. Eliminate defect cause.

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2: Charles V. Weber, "Capability Maturity Model, Version 1.1," IEEE Software, Vol. 10, No. 4, July 1993, pp. 18-27.