

Sensible implementation of high maturity practices with Do's and Don'ts

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Structure of the paper

- *Overview of the Process Areas at Maturity Level 4 and 5 of CMMI Staged Representation*
- *Some pointers to implementation of Maturity Level 4 Process Areas*
- *Keeping it focused and sensible*
 - *Some Do's and Don'ts*

Process Areas at ML 4 and 5 - Recap

Maturity Level 4 - Overview

- Organization Process Performance
 - Organization Goals
 - Process Performance baselines
 - Knowing where we are
 - Process Performance models
 - “Simplification of reality”
 - Provides insights into the underlying behaviour of a process

Maturity Level 4 - Overview

- Quantitative Project Management
 - Quantitative goals at Project level
 - “Compose” process
 - Identify “critical” sub process
 - Statistically manage sub process
 - Statistically manage project
 - Root cause analysis

Maturity Level 5 - Overview

- Causal Analysis and Resolution
 - Determine Causes
 - Address Causes

Maturity Level 5 - Overview

- Organizational Performance Management
 - Manage Business Performance
 - Select Improvements
 - Deploy Improvements



Pointers to implementation of OPP and QPM

Pointers to implementation - OPP

- Process Performance baselines
 - Characterized by measures of central tendency and dispersion
 - Control charts
 - Tests of stability
 - Tests of capability (*an OPM issue*)

Pointers to implementation - OPP

- Process Performance models
 - Segregate data into homogenous buckets
 - F test
 - t tests
 - ANOVA
 - Develop appropriate models
 - Multiple Regression models

Examples

- Process performance models

- Schedule Variance Model

- $SV = 0.458 - 0.604 \text{ RSI} + 0.00603 \text{ number of SIT defects/module}$

- Defect Analysis Model

- $\text{Production defects (Sev 1 and Sev 2)} = 30.7 - 7.11 \text{ DD FSD} + 0.552 \text{ DD testing}$

• Sub process performance models

- $RSI = 0.511 + 0.0214 \text{ DD FSD} + 0.00572 \text{ BRD review}$
- $DD \text{ FSD} = - 0.277 + 0.0121 \text{ time in review} + 0.0456 \text{ number of clarification}$

Pointers to implementation - QPM

- Given project goals, determine Probability of success (POS)
- Low POS indicates need to “compose”
- What to compose?
 - Study PPM
 - Select sub process to modify
 - Reasons for doing so?



Pointers to implementation - QPM

- Determine sub process goals
 - Simulation till acceptable POS
 - Generally, Monte Carlo simulation
- How to modify the sub process?
 - Brainstorming
 - Use 2nd level PPM, if available
- Implement modifications to the sub process

Examples

– Examples of critical sub processes

- Interface testing, sub process of SIT which, in turn is a Sub process of Testing Process
- Code Review – Sub process of Coding Process
- Functional Specs Review – Sub process of Requirements Understanding Process

Pointers to implementation - QPM

- Once project is underway, monitor sub process performance statistically
 - Tests of stability
 - Tests of capability
- If not stable or not capable, do root cause analysis
- Remove root causes and monitor further

Pointers to implementation - QPM

- Periodically, check values of Y . If enough data points are available, statistically manage Y as well

**Keeping it focused and
sensible – some DO's and
DON'Ts**

While developing PPMs, DO

- Avoid “cannibalistic” models
 - Sum of the whole is equal to the sum of its parts e.g.
 - $EV(\text{total}) = EV(\text{analysis}) + EV(\text{design}) + EV(\text{coding etc.})$
 - Doesn't indicate underlying behaviour of process
 - *However, distribution models like these may be useful for choosing the Y factor*

While developing PPMs, DO

- Look for all opportunities to increase richness of data
 - If data is available at a granular level and is representative of process behaviour, use it – do not aggregate unnecessarily
 - E.g. data at enhancement level vs release level

While developing PPMs, DO

- Let statistical tests be your primary indicator of homogeneity
 - We often do not take data into account which might have added to our richness
 - E.g. Project types / development environments etc.
 - *For all we know, development environments may not be a factor at all for certain metrics*

While developing PPMs, DO

- Look at x factors which are controllable
 - Not always possible, though!
- Keep in mind that an ideal model is one that has x's that lend itself to statistical control
i.e. repeats itself several times during the project life cycle

While developing PPMs, DO

- Focus on Ys that represent the real objectives of the Project Manager
- Find out what she actually wants to control
 - This also leads to richness of data
 - E.g. Y of SLA compliance vs Y of MTTR

While developing PPMs, DO

- Develop models that lend itself to stochastic understanding of process behavior, rather than deterministic
 - *Remember, merely being able to predict an outcome is not good enough*
 - *Behaviour of the x factors may be random within a range*

**And finally, while developing
PPMs, DO**

- Remember that while a model based tool is useful, it can often mask an understanding of underlying process behavior



While setting goals, DO

- Remember that both Upper and Lower Specification Limits are important
 - *Even if management / customer is only interested in the upper limit, it makes sense to have three values – Goal, USL and LSL*
 - *Eg. Schedule overrun less than 5% or SLA greater than 95% etc. are examples of one sided goals*

While setting goals, DO

- Remember that goals should:
 - Represent customer / management needs
 - Be realistic
 - Bear some relevance to past performance
 - *Yet, be aspirational; should have some improvements over the past*



While implementing QPM, DO

- Calculate the POS both by Y on Y method (based on past data of Y alone) and Y on X method (through the PPM)
 - If difference is high, then model may need to be recalibrated



While implementing QPM, DO

- Choose sub process from PPM, based on:
 - Controllability (judgement)
 - Stage in life cycle
 - Sensitivity tests
 - Repeatability within the project life cycle

While implementing QPM, DO

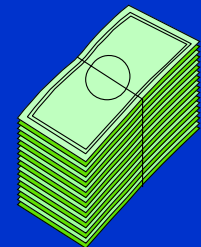
- Simulate the x factors not in your control, rather than the one that you intend to control

While implementing CAR, DO

- Remember that, amongst the important triggers for CAR are the statistical ones coming in from an analysis of control charts (SPC)
- Remember that the effect being analyzed in the CE diagram should be the one that was identified during SPC

And, finally, while implementing OPM,
DO

- Re-baseline process performance as a result of organization wide process and technology improvements



In conclusion,

- *Without under-playing the difficulties involved in implementing OPP and QPM, it is important to do so in a systematic manner – focusing on the PM's needs at all times*
- *One can't implement a model by just adopting a plethora of techniques – without keeping sight of the overall story*



Thank you!!



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