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 RSI + 0.00603 number of SIT defects/module
  - Defect Analysis Model
    - Production defects (Sev 1 and Sev 2) = 30.7 – 7.11 DD FSD + 0.552 DD testing
- Sub process performance models
  - RSI = 0.511 + 0.0214 DD FSD + 0.00572 BRD review
  - DD FSD = - 0.277 + 0.0121 time in review + 0.0456 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 (total) = EV analysis + EV design + EV 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 homogeinity
  - 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

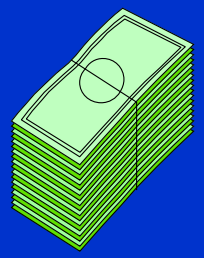
- Simulate the x factors not in your control, rather than the one that you intend to control

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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