Process Models and Performance Improvement – Future Perspectives

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OBJECTIVES

- Is the IDEAL\textsuperscript{sm} approach still relevant?

- Is partitioning up the system into its People-Process-Technology components, the right thing to do?

- What is at loss, if the focus of process improvement programs is at the organizational level?

- How should we future proof process discipline when it comes face-to-face with other approaches that seem to lack rigor?

- What should be expected from all stakeholders if Lean and Agile are the likely, New Age quick-fix solutions?
Some Perspectives …

Process Improvement programs and the maturing of the Indian IT Industry can be traced back to when the Software CMM was introduced by Motorola India in 1993.

- There were 18 Key Process Areas in the Software CMM
- One of the most eloquent process descriptions ever witnessed, was set between the covers of two, 1”-thick binders
- “The recipe is not the meal”!
- Level 5 process
Some Perspectives …

“Every fire is the same size when it starts” – Seneca

- Many other descriptions were consigned to being shelf-ware
- Totally unusable in the literal sense but,
- … whose sheer size was sufficient to scare an auditor/appraiser!
- Ten+ binders, each 3”-thick! And many more, Method 1, CS10000
- Level 2 process

Some Perspectives …

(3 of 6)

Around 1998, there were around Ten Level 5 organizations in India; process programs became overtly ambitious, momentum to create a one-size-fits-all started to grow, and the fire raged on!

- Software CMM morphed into an alphabetical soup called CMMI-SE/SW/IPPD/SS v1.1 – Staged and Continuous representations
- 700+ pages each
- Models themselves looked scary
- Lot of unnecessary repetition …
- Lots of room for interpretations …
- …possibility for lots of confusion!

Mar 2002
Based on the IDEAL$^{sm}$ model, the CMMI held out a promise for organizations committed to design their manifest process descriptions per its recommendations that, it would improve quality, reduce risks and rework.

“If a man with an ideal makes a thousand mistakes, I am sure that the man without an ideal makes fifty thousand. Therefore, it is better to have an ideal”.
– Swami Vivekananda
The Complete Works, Vol 2
As experiences with the process model grew, CMMI was broken up into 3 constellations with practices spread across 35 process areas

- Each addressing the 3 aspects of Development, Acquisition and Service Establishment and Delivery

Aug 2006  
Nov 2007  
Feb 2009
And then, there are 22 process areas in the People CMM for competency and people management bringing up the total to 57 process areas
Do we need so many practices spread across 57 process areas to realize the promise of improved quality, reduced risks and rework?
Is the IDEAL\textsuperscript{sm} approach still relevant?

Primary Motivation for Process Models and Performance Improvement even in the futuristic context will remain …

“How does an organization improve learning and minimize variation?” If the …

- Nature of problem: Chronic, with Unknown Cause
- Nature of project execution: Unknown Solution
- Understanding of Software Engineering is ~30-years old now!

! A better, …even though a “reactive” approach, is: DMAIC

- DEFINE – MEASURE – ANALYZE – IMPROVE – CONTROL inspired from Lean Six Sigma
- Short 2-3 months duration project cycles with focus on $ advantage and lifecycle determination at the project level
- Continually Narrow Performance Gap/Variation – focus on the average
- Documentation: Required, Necessary and Sufficient to ensure continuity until retirement of the solution
Is partitioning up the system into its People-Process-Technology components the right thing to do?

From:
A set of activities, methods, practices, and transformations that people use to develop and maintain software & associated products

To:
Being considered the “glue” that ties the triad together.

NEW Definition:
Flow-based process transformations that people create, use, and improve to establish solutions that constantly narrows performance gap while demonstrating benefits in projects by exploiting automation.

Shift Focus Down From:
Organization

Using:
DMAIC or Continuous Representation
What is at loss, if the focus of process improvement programs is at the organizational level?

In projects – is where all the action happens; most opportunistic process area specific improvements are tightly integrated with tools & technologies wherein, $$ benefits and other quantitative advantages get highlighted

One of the key challenges while designing a software process that is positively enabled for process measurements is –

- to ensure data collection, analysis, storage and communication of results to relevant stakeholders for process adjustments and,
- subsequent improvements are made part of the process itself
- Little, to no value in aggregating measurements at the organizational level; shelf-life of a PCB is nothing more than 3-months! *And, variation is NOT explained by the process definition*

<table>
<thead>
<tr>
<th>Metric</th>
<th>Unit of measure</th>
<th>Q1 YYYY performance</th>
<th>Q2 YYYY performance</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Average Std. Dev. Sample Size</td>
<td>Min. Average Max. Std. Dev. 95% CI Mean</td>
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<tr>
<td>COQ</td>
<td>%</td>
<td>13.88 0.97 9</td>
<td>17.98 19.90 21.82 1.35 19.02-19.82</td>
</tr>
</tbody>
</table>

- Besides, data must be sourced from a set of homogeneous projects – which is extremely difficult to guarantee

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How do we future-proof process discipline when it comes face-to-face with other approaches that lack rigor?

Can the first part of each of these “what-we-value over…” statements, taken from the Agile manifesto …

- Individuals and interactions over process and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

… be realized in practice without the support of the second part?

Apparent cognitive bias in these statements … “fat-free milk over 2% milk”!

Without some basis that promotes institutionalization, it is difficult to imagine how the oft-quoted 12 Agile principles will automatically fall in place. “Magic is rare in software engineering!”

Performance improvement must be a core OD strategy requiring investments to build process competencies for every individual in an organization, in every project – PM must be made in charge.
What should be expected from all stakeholders if Lean and Agile are the likely New Age quick-fix solutions?

Many of the institutionalization features of the CMMI or the People CMM help to make gains due to the process improvement program for a project, “permanent”

- No proof that projects without institutionalization capability, can leverage value from reuse and can offer cycle time reduction
- Also consider: effects of attrition, competency erosion, poor KT and no documentation; very bad combination which is reality!
- Without a “process language” possibly embedded in collaboration tools such as TFS or SharePoint, it is hard to believe Agile projects can operate beyond a hypothetical maturity Level 1/2
- It is very hard for any project, Agile/Lean based or otherwise, to shrug-off the importance of say, …
  - Baselines of identified work products are established (CM-SG1)
  - Coordination and collaboration between the project and relevant stakeholders are conducted (IPM-SG2)
  - Or, just about any goal statement!
The core issue for process heavy implementation appears to be—

- “English like” interpretation of the model without the right expertise in problem/domain analysis, or application of professional judgment to day-to-day “project” issues
- Rigid enforcement of sub-practices/practices and other informative components of the model, instead of permitting alternative solutions while keeping the focus on “goals”
- Wrong and inaccurate interpretation of the models based on what was heard and said by someone considered wise with missing context information; blame LinkedIn Groups!

It is actually a lot easier to gear projects, to equip themselves with the right processes and measurement systems, so that—

- data collection, analysis, storage and communication of results to relevant stakeholders for process adjustments and,
- subsequent improvements are made part of the project execution
Conclusion

It is almost **impossible** for the one-dozen Agile principles to magically fall in place without institutionalization!

- Satisfy the customer through early and continuous delivery of **valuable software** *(if it is valuable, then where is the documentation?)*
- Welcome changing requirements, even late in development *(is in knowing what, and how much to change; expects good change, configuration and release management to pin-point the problem)*
- Deliver working software frequently, with a preference to **shorter time scales** *(is in good design, integration, testing and reuse)*
- Collaboration amongst business people and developers throughout the project *(is in having an established “language” of collaboration, aka process, besides collaboration tools)*
- Build projects around motivated individuals and **trust** them to get their job done *(in God we Trust, the rest bring factual data and proven competencies to bear)*
- Face-to-face communication as the most efficient and effective method of conveying information *(but, many geographically distributed projects succeeded with a solid process)*

Contd...
Conclusion

Contd…

- Working software as the primary measure of progress (*what about secondary measures required to build “trust”?*)
- Agile process promoting sustainable development among sponsors, developers and users in an indefinite manner (*indefiniteness is in making other things such as, a disciplined process, definite!*)
- Continuous attention to technical excellence and good design enhancing agility (*every project must be executed the Agile way, but, using CMMI and People CMM as enablers*)
- Simplicity -- -- is essential (*Process is what you make of it*)
- Self-organizing teams that develop architecture, requirements, and design (*trust based empowerment is key*)
- Periodic team reflection to tune and adjust behaviors accordingly (*needs a structure for such reflection to be effective*)

I hope that the next SPIN Conference draws a lot more presentations and participation from project managers and from those actually burning their fingers!
References


POINTS TO PONDER …

- A control chart is just a “limited use” heuristic memory chart! New baseline affects old baseline and therefore PCBs should only be given the importance they truly deserve.

- Process is very much “software”! It is therefore as important as what we otherwise call, “software”.

- Build your process improvement programs keeping the customer in mind. If the customer wants a Level 2 process, why thrust a Level 5 process? “Beware of Over-Processing”

- Most causal analysis and risk management processes are underleveraged because they are built only for prevention; what about detection?

- Don’t under-estimate importance of the “quick”, “do-it-now” improvements; that is what Lean and Kaizen is all about!
Thank You!

DISCUSSIONS, Q&A

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