CSE Annual Research Review

Group 2

Creating Lean Disciplined Methods
&

Synthesizing Hybrid Agile/Disciplined Methods

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Participants
Name; Organization

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Rich McCabe: SPC
Karen Owens: Aerospace
Kirk Horton: Aerospace
Paul Stelling: Aerospace
Jongmoon Baik: Motorola Labs
Rosemary Hsu: Aerospace
A W Brown: CSE
Meghna & Sachin Shah: CSE (scribes)
Yue Chen: CSE
Scott Henninger: UNL & Adaptive Process Technologies
Approach

Purpose identified

• For CSE: research opportunities
• For Participants: share information and knowledge

Discussion based on needs and wishes

Brainstorm related topics: challenge or potential technique [opportunity]

Prioritize the list

Work the list until time runs out 4:00PM (design to schedule)

• Gather notes
• Prepare bullet point(s) for outbrief

Assess Importance and Difficulty

Review & finalize the outbrief of I,D rated topics
Purpose

For CSE: research opportunities

- Typically: High importance and high difficulty
- Secondarily: Low to intermediate difficulty but needs independent broker

For Participants: share information and knowledge
[Details to be provided in a separate handout]
Discussions

C: If hybrid, how much is enough? How to find the balance/sweet spot?

• O: CORE – Constructing an Organizational Repository of Experience (couple process development/evolution with knowledge management) [it depends is the answer to every question]

• C: What characteristics make up the core of agility? Which ones are needed for which benefit? What practices must be done in combination in order to be effective?
  – C: How do you make an agile process repeatable? How do you learn from it?

• C: What are the reasonable hybrids?
Discussion On Hybrids (cont.)

How to capture experience so it can be applied usefully? Key is communication; can it be done without the human boundary spanners

- Patterns of
  - risks/mitigations;
  - environment/context and constraints
  - success because of context/method vs. heroics

- Cockburn uses three levels of knowledge

- Does an SEPG make sense? An in-house process consultant?

- Transform pattern into OT?
Discussion On Hybrids (cont.)

Sweet spot:

- Are B&T’s 5 dimensions enough? Is B&T’s approach too procedural?

- Are groupings of dimensions on a context basis a better approach?

How important is “iteration” to agile methods
Discussion On Hybrids (cont.)

C: What characteristics make up the core of agility? Which ones are needed for which benefit(s)?

- Green field Start up: Ken Beck says try to use all twelve
- Existing non-agile culture: pick the one with biggest bang for the buck (address the biggest pain first).
  - Poor design practices: try pair programming
  - Customer satisfaction: get them on site
  - High defects: test first (with peer reviews as part of the pair programming; or continue with peer reviews if already being practiced)
  - Changing requirements: frequent re-prioritization
- Classify the problems and solutions that had demonstrated results
Hybrid by parts (C: Does it make sense to have some sub-teams be agile and others not?)

- One (small) existence proof exists (RM); fits into the transforming an organization context

- Issue: Coordination with non-agile groups
  - Meet the Letter of Review (e.g. PDR), but reduced contents and post review modifications;
  - Meet the spirit of the Review (e.g., PDR) incrementally; but must do the Arch & Interface Spec first;
  - When to update/coordinate changes
  - Different time/place tacit knowledge transfer: “document” by webcast presentations;
Discussion On Hybrids (cont.)

Hybrid by parts (C: Does it make sense to have some sub-teams be agile and others not?) [cont.]

• Given contractor making Module X and sub’s utilizing services of Module X:
  – Specify interface at first
  – Versioning the software AND the interfaces
  – Identify possible/probable areas of change

• Issue: Selection of which groups do agile approaches
  – Willingness to change;
  – Self selection (based on amount of internal risk in the group; and fit to agile profile)
  – Have project manager dictate
Discussion on WinWin Spiral

Opportunity for

• Decision support for transitioning from traditional to agile/hybrid methods
• How to identify what should be planned for in a non-anchor point Construction (i.e., post-LCA) milestone
• How to measure success at a post-LCA milestone or decide cut further “loses”
  – How much of project is done, and how well
  – How much of the project is still to do
  – What knowledge was acquired and how will it be used (to reduce risk)
Discussion on WinWin Spiral (cont.)

Distributed “The definition of spiral development”¹

Spiral Model for Acquisition (with ARBs at Anchor Points)

Spiral Model for Development (with ARBs at Milestones)

• Architecture Review Boards: LCA Anchor Point Review
• Architecture Review Boards:
  Spiral Increment Milestone Reviews post-LCA?
• Feasibility Rationale Document (to support ARB)

WinWin Spiral for Acquisition
(Cost not to scale)

1a. Identify Success-Critical Stakeholders

1b. Stakeholders Identify System Objectives, Constrains, & Priorities (OC & P's) Alternatives Solutions Elements

2a. Evaluate Alternatives with respect to OC & P's

2b. Assess, Address Risks

3. Elaborate Product and Process Definition

4. Verify and Validate Product and Process Definitions

5.

6.

7.

8. Stakeholders’ Commitment

Stakeholders’ Review

LCA ARB after SDD

LCO ARB after CTD

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WinWin Spiral for Development
(cost not to scale)
1. Identify Success-Critical Stakeholders

2a. Evaluate Alternatives with respect to OC & Ps

2b. Assess, Address Risks

3. Elaborate Product and Process Definition

4. Verify and Validate Product and Process Definitions

5. Stakeholders' Review

6. Commitment

7. Progress Through Steps

8. Stakeholders Identify System Objectives, Constrains, & Priorities (OC & Ps) Alternatives Solutions Elements
Architecture Review Boards

The purpose of an LCA ARB review is to:

• Show for the selected architecture, a system built to the architecture will:
  – Support the Ops Concept
  – Satisfy the Requirements
  – Be faithful to the Prototype(s)
  – Be buildable within the budgets and schedules

• Ensure all major risks are resolved or covered by risk management plan

• Ensure that the key stakeholders are committed to support full life cycle including the Transition and Maintenance phases.

• Ensure the selected architecture is feasible
Architecture Review Boards (cont.)
The purpose of a post-LCA ‘ARB’ review is to:

- Show for the previous spiral that:
  - The capabilities continue to support the Ops Concept²
  - The capabilities satisfy _% of targeted Requirements²
  - The “delivery” integrates with previous deliveries at cost C and schedule used of S

- Show for the previous spiral, how much knowledge gained or value of delivery

- Show for the next spiral, that the project remains buildable within the budgets² and schedules² for the value²

- Ensure all major risks are resolved or covered by risk management plan

- Ensure that the customer and developer stakeholders are committed to support the next spiral cycle

- Ensure the selected architecture remains feasible

² May have evolved due to a parallel, concurrent re-assessment
Feasibility Rationale

Which provides evidence via

- analysis,
- simulation,
- exercising,
- etc.,
- modeling,
- benchmarking,
- memoranda of agreement,

That a system built to the proposed architecture will:

- Support the operational concept;
- Satisfy the requirements;
- Be faithful to the prototype(s) or system components developed to date;
- Be buildable within the budgets and schedules in the plan;
- Show a viable return on investment or provide the desired utility & supportability instead of "cost"
Feasibility Rationale (cont.)

Also shows that all major risks are either

• resolved or
• covered by risk management plans, and

Will establish the key stakeholders’ commitment to proceed.
### Groupings of Challenges (C) & Opportunities (O) With Importance (I) & Difficulty (D)

<table>
<thead>
<tr>
<th>Groupings of Challenges (C) &amp; Opportunities (O) With Importance (I) &amp; Difficulty (D)</th>
<th>I</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer</strong></td>
<td></td>
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<tr>
<td>• 1. <strong>C:</strong> How to get enough of the right kind of customer participation (in contracting environment; in product development organization)</td>
<td>H- M</td>
<td>H</td>
</tr>
<tr>
<td>– <strong>C:</strong> How do you get customer to accept more frequent delivery or demonstrations.</td>
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<tr>
<td>– <strong>C:</strong> How to do agile development with a traditional customer (contract management; product development)</td>
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<tr>
<td>• 2. <strong>C:</strong> How do you get diverse customers/stakeholders to agree to solutions [or anything], or resolve conflicting goals?</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>– <strong>O:</strong> EasyWinWin negotiations</td>
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## Hybrid

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<td>What are the reasonable hybrids?</td>
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<tr>
<td>C:</td>
<td>Assuming Hybrid and Traditional are part of the culture, how to decide which to use when.</td>
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<td><strong>PAIRs</strong></td>
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<td>4. O: Increasing the competence of novice people by pairing with senior people in an Agile/Hybrid environment</td>
<td>L³-M⁻H⁴</td>
<td>M⁻H⁶</td>
<td></td>
</tr>
<tr>
<td>5. O?: Pairing one to many/group vs. one to one</td>
<td>L</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>6. C: Individuals in group under deadline pressure may devolve out of pair approaches?</td>
<td>L</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>7. C: Special hardware/environment for pair programming: Possibly for remote/distributed pair programming (telecommuters⁵).</td>
<td>L-M</td>
<td>M⁻H⁶</td>
<td></td>
</tr>
</tbody>
</table>

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³ Not a big enough deal
⁴ A better way for OJT; This is a way to not hinder the novices; current approach is start on small, trivial problems (self train; non-interfering.
⁵ Medium for telecommuting; Netmeeting plus: is separate audio enough (after the first time); what about video and smell?
⁶ How to measure the productivity impact? Net gain over time: Short term vs long term.
<p>| Measures |
|-----------------|-----------|
| 8. C: How to measure the process(es) of Agile methods; for comparison with traditional or hybrids | M | M |
| 9. C: How to measure progress in an agile or hybrid method; trade risk vs value [benefit] | H | H |</p>
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<td><strong>Ungrouped</strong></td>
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<tr>
<td>• 10. C: Multiple cycles within cycles to deal with safety, criticality, etc. (things that force long cycle times: big components;ilities)</td>
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<tr>
<td>– O: WinWin Spirals Models</td>
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<tr>
<td>– O: Feasibility Rationales (document) &amp; ARBs</td>
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<td>• 11. C: How to change traditional cultures to accept Agile methods (adaption to changes in requirements); How to get traditional cultures and environments more moving target oriented rather than “gun-sight” oriented</td>
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<td>• 12. C: What are the biggest impediments perceived in your organization to transitioning to hybrids?</td>
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<tr>
<td>• 13. C: Non-dedicated personnel in agile projects; Resource/self management of multi-tasking in an agile environment.</td>
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7 Throw it over the wall to transition
I vs. D

Difficulty

Importance

#1 #2 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13

0 1 2 3 4 5 6 7 8 9 10