Win Win Concept of Operation and Benefits

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USC-CSE Annual Research Review
March 11, 1996

Outline

- Motivation for Win Win Approach
- Win Win Elements
  - Theory W: a management theory
  - Win Win Spiral Model: a process model
  - Win Wln: a groupware support system
- Win Win Concept of Operation
- Win Win Benefits
Motivation for Win Win Approach

- Establishes objectives and procedures for Integrated product teams (IPTs)
  - What should the IPT participants try to do?
  - How should they proceed?
  - How will they know when they're done?
- The fundamental success condition
- Some common counterexamples

The Fundamental Success Condition

Your project will succeed

If and only if

You make winners of all the critical stakeholders

- Usually: Users, customers, developers, maintainers
- Sometimes: Interfacers, testers, reusers, general public
Some Common Counterexamples

<table>
<thead>
<tr>
<th>Proposed Solution</th>
<th>&quot;Winner&quot;</th>
<th>Loser</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick, Cheap, Sloppy product</td>
<td>Developer &amp; Customer</td>
<td>User</td>
</tr>
<tr>
<td>Lots of bells and whistles</td>
<td>Developer &amp; User</td>
<td>Customer</td>
</tr>
<tr>
<td>Driving too hard a bargain</td>
<td>Customer &amp; User</td>
<td>Developer</td>
</tr>
</tbody>
</table>

Actually, nobody wins in these situations

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Theory W Management Steps

1. Identify success-critical stakeholders
2. Identify stakeholders' win conditions
3. Identify win condition conflict issues
4. Negotiate top-level win-win agreements
   - Invent options for mutual gain
   - Explore option tradeoffs
   - Manage expectations
5. Embody win-win agreements into specs and plans
6. Elaborate steps 1-5 until product is fully developed
   - Confront, resolve new win-lose, lose-lose risk items
Stakeholder Role Variations

<table>
<thead>
<tr>
<th>Market Sector</th>
<th>Customer</th>
<th>Developer</th>
<th>User</th>
<th>Maintainer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Product</td>
<td>Vendor, Consumer Mgmt.</td>
<td>Vendor</td>
<td>Consumer</td>
<td>Vendor</td>
</tr>
</tbody>
</table>

Negotiation Principles*

- Don't bargain over position
- Use 4-step solution approach
  - Separate the people from the problem
  - Focus on interests, not positions
  - Invent options for mutual gain
  - Insist on using objective criteria

*Fisher & Ury, Getting To Yes, 1981
Inventing Options for Mutual Gain

- The four basic steps: Fisher and Ury

**In Theory**
- Step I: Problem
  - What's wrong?
  - What are current symptoms?
  - What are desired facts contradicted with a preferred solution?

- Step II: Analysis
  - What are possible messages or presuppositions?
  - What are some potential causes?
  - Commonly held ideas about what might be done.

**What is wrong**
- What might be done

**In the Real World**
- Step III: Approaching
  - What are possible messages or presuppositions?
  - What are some potential causes?
  - Commonly held ideas about what might be done.

- Step IV: Action
  - What might be done?
  - What specific steps might be taken to deal with the problem?

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Win-Win, Win-Lose, and Lose-Lose Situations

- Developer's Win Space
  - Win-Lose
  - Win-Win

- User's Win Space
  - Win-Lose
  - Win-Win

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Page 6
Getting to Win-Win: COCOMO F-16 Example

Product Developer can build in 12 months

Product user wants in 12 months

Add Technology, Key People

Prioritize Development Increments

Page 7
Win Conditions: STARS Constituencies

- Primes, commercial counterparts
  - Software Engineering Environment sales
  - DoD acceptance of commercial SEE product line
  - Leverage on Primes' software business
  - Satisfied customers and users

- Subs, tool vendors:
  - Profits from large tools marketplace
  - Open architecture, multi-platform, polylingual
  - Stable evolution, voice in evolution strategy

Win Conditions: STARS Constituencies

- DoD software contractors: leverage on software business
  - Open architecture, multi-platform, ease of extension
  - Rapid availability, ease of use, reasonable cost
  - Stable evolution, voice in evolution strategy

- DoD O&M organizations: life-cycle software support effectiveness
  - Similar concerns to DoD software contractors
  - Support of software modernization, Ada transition

- Services, Agencies
  - Significant improvement in software productivity and quality
  - Reduced risks of SEE adoption

- DARPA, OSD, Congress, other government agencies
  - All of the above
  - Life-cycle affordability
  - Ada mandate
Some STARS Win-Win Experiences

- Ada mandate: Write all STARS software in Ada
- Commercial vendors: Ada incompatible with non-DoD marketplace
- No commercial support: Unaffordable SEE's
- Win-Win solution:
  - Commercial vendors agree on Ada tool support
  - OSD agrees to accept Ada waiver for STARS, based on life-cycle cost-effectiveness
- Process time-consuming, misunderstanding-prone
  - 5 months from basic agreement to success plans
  - Needed groupware support

STARS Win Win Results

- Successful large-scale demo projects
  - Effective government-industry collaborations
  - Air Force Space C2: $140 \rightarrow $57/LOC
  - 3 \rightarrow 0.35 defects/KLOC
  - Navy Simulators: $125 \rightarrow $65/LOC
  - Army Signal Proc: 50% product line reuse savings
- Stimulated major product-line reuse initiatives
  - DoD, Services Software Reuse Plans
Theory W Extension to Spiral Model

1. Identify next-level Stakeholders
2. Identify Stakeholders' win conditions
3. Reconcile win conditions. Establish next level objectives, constraints, alternatives
4. Evaluate product and process alternatives. Resolve Risks
5. Define next level of product and process - including partitions
6. Validate product and process definitions
7. Review, commitment

Win Win Spiral Model and Major Milestones

<table>
<thead>
<tr>
<th>Cycle 1</th>
<th>Cycle 2</th>
<th>Cycle 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCO</td>
<td>LCO</td>
<td>LCA</td>
</tr>
<tr>
<td>Determination of top-level concept of operations</td>
<td>Determination of detailed concept of operations</td>
<td>Elaboration of detailed concept of operations by increment, especially IOC</td>
</tr>
<tr>
<td>System scope/ bound/ interfaces, top-level requirements</td>
<td>Top-level HW, SW, human requirements</td>
<td>Determination of requirements, growth vector by increment, especially IOC</td>
</tr>
<tr>
<td>Small number of feasible candidate architectures (including major COTS, reuse choices)</td>
<td>Provisional choices of top-level information architecture</td>
<td>Choice of life-cycle architecture Some components of above TBD (ber-net and/or defensible)</td>
</tr>
<tr>
<td>Top-level life cycle responsibilities (designers), process model, cost/ schedule parameters</td>
<td>More detailed process strategy, responsibilities, cost/schedule allocation</td>
<td>Thorough WWWWWW plans for IOC, essentails for later increments</td>
</tr>
<tr>
<td>Stakeholder concurrence on top-level analysis supporting win-win satisfaction</td>
<td>More detailed analyses supporting win-win satisfaction</td>
<td>Stakeholder concurrence on thorough analysis supporting win-win satisfaction</td>
</tr>
<tr>
<td>Top level rationales, including rejected candidate architectures</td>
<td>More detailed rationales underlying system choices</td>
<td>Elaboration of rationale, including risk resolution results</td>
</tr>
</tbody>
</table>

IOC: Initial Operational Capability
LOO: Life Cycle Objectives
LCA: Life Cycle Architecture
Win Win as a Requirements Engineering and Architecting Approach

- Stakeholders use groupware support system to identify win conditions, negotiate win-win agreements
  - Schemas for win conditions, conflicts, agreements
  - Domain taxonomy and glossary
  - Taxonomy-based navigation aids
  - Tradeoff analysis tools
- Stakeholders supported by system engineering organization
  - Analyzing win condition conflicts, generating solution options, coordinating progress
- Negotiated points of agreement become system specs

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"Stakeholders" Aren't Homogeneous

- May be some general stakeholder patterns
  - Implementation-orientation, risk-aversion, change-aversion
- But don't assume stakeholders are homogeneous
  - People represent themselves, projects, organizations, communities to varying degrees
- Collaboration process implications
  - Getting the right people involved
  - Empowerment and accountability
  - Incentives to collaborate
  - Teambuilding

Collaboration Process Preconditions

- Appropriate staffing of stakeholder representatives, system engineering function
  - Stakeholder representatives: empowered, accountable, representative, collaborative, knowledgeable
  - System engineers: understanding of stakeholder domains, collaboration management ability, analytic skills
- System engineer/stakeholder pre-work
  - Characterize existing system, related concerns
  - Identify, discuss candidate solutions
  - Clarify collaboration process objectives, approach
  - Hold stakeholder workshop
  - Contact-seeking, teambuilding, support system training
Related Work

High

Low

Low Groupware Support

High

Collaboration Guidance

IPT's, QFD

Win Win, NATURE

GIBIS, SIBYL, REMAP

Coordinator, Object Lens

Lotus Notes, Convers'n Builder

Win Win Benefits

- Gets key stakeholders involved
- Provides collaborative operational guidelines
- Provides criteria for evaluating success
- Reduces cycle time
- Especially for distributed collaboration
- Complements other key front-end tools and methods