Establishing the Business Case for Process Improvement:
Early Successes in a Government Organization
The TARIF Process Improvement Experience

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Overview

• Organization profile
  – Who is TARIF, and what makes them TARIF?

• Approach taken
  – What we did and why

• What has worked for us
  – And might work for you

• What has not worked
  – The mistakes you don’t need to repeat
Supporting the Warfighter: Tactical Air Ranges Integration Facility

Naval Air Weapons Station
China Lake, CA
TARIF Supports Aircrew Training

Joint TARIF Range

Airborne Instrumentation System (AIS)

3 P4A Pods
1 P4B Pods

TIS Remote J205
TIS Remote J90
TIS Remote J46
TIS Remote J202

Aircrew Debriefing System

SSA:
Navy TACTS
Air Force ACTS
Our Customers:
TACTS/ACTS Ranges

- Alaska
- China Lake
- Lemoore
- Hill
- Nellis
- Fallon
- Goldwater
- Yuma
- El Centro
- Wisconsin
- Gulfport
- Tyndall
- Key West
- Homestead
- Cherry Point
- Oceana
- Langley
- Beaufort
- Savannah
- Beaufort
- Savannah

- USN
- USMC
- USAF
- ANG
Organization Profile
Who is TARIF?

• **Primary software product** – Control and Computation Subsystem (CCS)
  – Evolved over the last 30 years
  – 250K lines of Fortran and C++ code on a PC

• **The development team**
  – A mix of a dozen Government and contract software engineers
  – Mostly very senior engineers who are domain experts, with the core team having been together for over ten years
Organization Profile
TARIF Process Improvement History

- TARIF has a long history of process improvement
- Progress has been continual, but necessarily slow due to system complexity and high work loads
- Four acceleration factors
  - TARIF management is committed to this CMMI effort
  - TYBRIN’s proposal for this contract included a commitment to help get the TARIF to CMMI level 3
  - Brought in Natural SPI as CMMI consultants
  - A process improvement lead was appointed
High-Level Business Goals

- Establish processes that deliver high quality systems to sponsors and ranges on schedule and within budget
- Ensure TARIF's continued success is not dependent upon specific individuals
- Achieve CMMI (Staged Representation) Level 3
- Quantitatively analyze and understand organizational processes and how those processes meet TARIF’s business needs
Organization Profile
What makes them TARIF?

• TARIF’s cultural flavor
  – Comfortable testing procedures in production
  – Heroes treasured over planners
  – Peer reviews are used and add value
  – Meetings do much more than communicate information
  – All decisions are by committee and consensus
  – Organization and responsibility is assumed, not documented
  – Open door leadership is used to manage the organization
  – The people in leadership positions are liked
  – The organization is schedule driven, a release gets delivered every 6 months with the functionality that is complete
Approach Taken

• Taking into account the cultural flavor of TARIF when implementing change, and what it is costing:
  – Don’t worry about a procedure or template being perfect before putting it into play
  – Finding a way to make the planners heroes
  – Building on the current peer review process, don’t replace it
  – Using the existing meetings, don’t create new ones
Approach Taken (2)

• Taking into account the cultural flavor of TARIF when implementing change, and what it is costing (continued):
  – Empowering the decision making committees
  – Adjusting the organization as needed
  – Using the well-liked leaders and their knowledge of what will work
  – Could make the process improvement project a schedule-driven crisis
Approach Taken (3)

- Timing is important; start the process improvement at the right time. Some timing factors for TARIF are:
  - There are business problems to solve
  - There is competition for the product
  - There is someone to solve the problems for
  - The organization has some time and money to spend on change
  - There were some native processes already growing
  - The organization was not on the brink of a reorganization
Approach Taken (4)

• Chose the correct model for the business:
  – They deliver integrated HW/SW systems to their customers, the CMMI makes sense

• Assessed the current state against the model:
  – Conducted a baseline appraisal to find out where they are

• Determined what requirements needed to be fulfilled to meet the business goals:
  – Defined what needed to be changed, to meet the goals
Approach Taken (5)

- Prioritized the requirements
  - Some things needed to be in place first, like a library, and you cannot do it all at once

- Plan the effort as a project
  - Know what it will take before you begin

- Staff the effort with the right level and type of resources
  - On site, part-time process improvement project lead
  - On site, part-time process improvement project manager
  - On site and off site support by part-time consultants
Two-Pronged Approach: You Can’t Outsource Process Improvement

- **Outside-In: Natural SPI**
  - Process improvement expertise
  - Frameworks and infrastructures
  - Support mechanisms
  - Tailored for TARIF

- **Inside-Out: TARIF**
  - Management processes
  - Engineering processes
Consultant – Client Relationship: Roles Should Reverse as Maturity Grows

- CMMI Level 2
- CMMI Level 3

External domain competency & effort
Native domain competency & effort

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Approach Taken (6)

- Manage the effort as a project
  - Track what is being done and what isn’t
  - Replan when necessary
  - Define your success criteria and celebrate your successes
What Has Worked

**Traditional Approach**
- Assuming the organization has no process and starts from scratch
- Forming teams for each process area and writing procedures that mimic the CMMI
- Assuming the organization is different and has to reinvent process improvement
- “Slash-and-burn” approach; delete *.* on processes and start over
- Preaching process but not practicing it

**Our Approach**
- Knowing the starting point through a gap analysis appraisal
- Prioritizing the process improvements through business need and critical path
- Bringing in outside CMMI expertise to jump-start the effort using selected standard approaches
- Building on and leveraging existing best practices
- Planning and managing the process improvement project
What Has Worked: Tracking Progress

• Important to communicate progress
• Monthly status reports
• The visual view - two useful tools
  – Quilt charts
  – First/Last/Now charts
## Quilt Chart: Level 3 Specific Practices Satisfied

| Process Area | Specific Practice | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 3.1 | 3.2 | 3.3 | 3.4 | 3.5 | 4.1 | 4.2 | 4.3 |
|--------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| RD           |                  | N   | P   |     |     |     |     | P   | P   | P   |     | N   | N   | P   | P   | P   |     |     |     |
| TS           |                  | P   | N   | P   |     |     |     | N   | N   | N   | P   |     |     |     |     |     |     |     |     |     |
| PI           |                  | N   | N   | N   |     |     |     | P   | N   |     |     | N   | S   | P   | S   |     |     |     |     |
| VER          |                  | N   | N   | N   |     |     |     | N   | N   | N   |     | N   | P   | N   |     |     |     |     |     |
| VAL          |                  | S   | S   | S   |     |     |     | S   | S   |     |     |     |     |     |     |     |     |     |     |
| OPF          |                  | S   | S   | S   |     |     |     | S   | S   | P   | P   |     |     |     |     |     |     |     |
| OPD          |                  | P   | S   | N   |     |     |     | P   | P   |     |     |     |     |     |     |     |     |     |
| OT           |                  | P   | S   | P   | N   |     |     | N   | S   | N   |     |     |     |     |     |     |     |     |     |
| IPM          |                  | N   | P   | P   | P   | P   |     | P   | P   | S   |     |     |     | P   | P   |     |     |     |     |
| RSKM         |                  | S   | P   | N   |     |     |     | P   | P   |     |     |     |     |     |     |     |     |     |
| IT           |                  | P   | P   | P   |     |     |     | S   | S   | S   | P   |     |     |     |     |     |     |
| DAR          |                  | S   | S   | N   | P   | P   | P   | N   | N   | P   |     |     |     |     |     |     |
| OEI          |                  | P   | N   | N   |     |     |     | N   | N   | P   |     |     |     |     |     |     |     |

CMMI Level 3 Specific Practices

- RD: Risk Management
- TS: Technical Support
- PI: Process Improvement
- VER: Verification
- VAL: Validation
- OPF: Operations Management
- OPD: Operations Data
- OT: Organizational Transformation
- IPM: Improvement Management
- RSKM: Risk Management
- IT: Information Technology
- DAR: Data Analysis and Reporting
- OEI: Operational Excellence Improvement
First/Last/Now Chart: L2 Specific Practice Implementation

Level 2 Specific Practice Implementation

- **1st**
- **Last**
- **Now**

- Requirements Management
- Project Planning
- Project Management & Control
- Supplier Agreement Management

- Not planned/implemented
- Planned
- Implemented
What Has Not Worked

• The organization has a history of false starts
  – Escape velocity not achieved

• The amount of time the project lead has been able to spend on the process improvement effort has not been sufficient

• The engineers are too good

• Incentives for planners vs heroes is not in place yet, crisis driven

• Change is hard and takes time

• Change is iterative
Requirements for Change

(from the American Management Association)
What we have learned and you don’t have to relearn

- Have a business need for change
- Use the correct improvement model for your business
- Determine where you are and where you want to be
- Prioritize the changes
- Jumpstart the effort with external expertise
- Apply the correct amount and type of resources
- Run the effort as a project
Questions?

Who can I contact for more info?

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