Team of Three

How to get Program, Functional, and Process Management Working Together

**Raytheon Missile Systems
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Organization and Accomplishments

Raytheon Missile Systems, Headquarters Tucson, AZ

⭐ Employees: 11,000

⭐ '04 Sales: $3.8 B

⭐ World Largest Appraised SEI CMMI Level 3 Organization December 2004

⭐ SW-CMM Level 5 in November 2001

RMS Approach to MA

- Analyzed the PBA findings and created a work plan
- Benchmarked against other CMMI Level 3 Raytheon Organizations
- Conducted peer review of Organizational MA Plan
- Conducted Several focus groups
  - Program Management
  - Functional Organizations
  - CMMI Experts
  - Six Sigma Experts
- Concluded Template approach best
- Team of Three concept is born
- Measurement Analysis could cover more

Overview of M&A Process

- The purpose of Measurement and Analysis at RMS: **The Measurement and Analysis (M&A) process is intended to provide information to the projects to make informed decisions to minimize risk and ensure project success while helping to support the overall organization's business objectives.**

- The purpose of Measurement and Analysis in CMMI: **The purpose of Measurement and Analysis is to develop and sustain a measurement capability that is used to support management information needs.**

How the Right Measures Help Teams Excel- Harvard Business Review

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- The overarching purpose of a measurement system should be to help a team, rather than top managers, gauge its progress.

- A truly empowered team must play the lead role in designing its own measurement system.

- Because a team is responsible for a value-delivery process that cuts across several functions (like product development, order fulfillment, or customer service), it must create measures to track that process.

- A team should adopt only a handful of measures.

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What did RMS do?

- Created a series of workshops with Program Management
  - Brought to the table the critical success factors, contractual requirements and lessons learned from previous programs
  - Program Management Team took first cut at what goals, information needs and measurements objectives for the program were.
  - Once these items were determined then metrics were selected
  - Program management would then lead a workshop with IPT Leads to go over selections get buy-in from IPT Leads
  - Once the program management and IPT Leads agreed on the metrics the process was repeated with the metric collection points
 - Functional and process representatives were selected by program team

Process Improvement Requires Synergy between Organization and Programs

- To achieve high levels of process maturity, the organization and programs must work closely together
  - **New process at the organization level need to be deployed to programs**
  - **Best practices and lessons learned from the program levels must be flowed to the organization and shared across programs**
  - **Quantitative management activities need infrastructure to facilitate metrics collection and analysis**
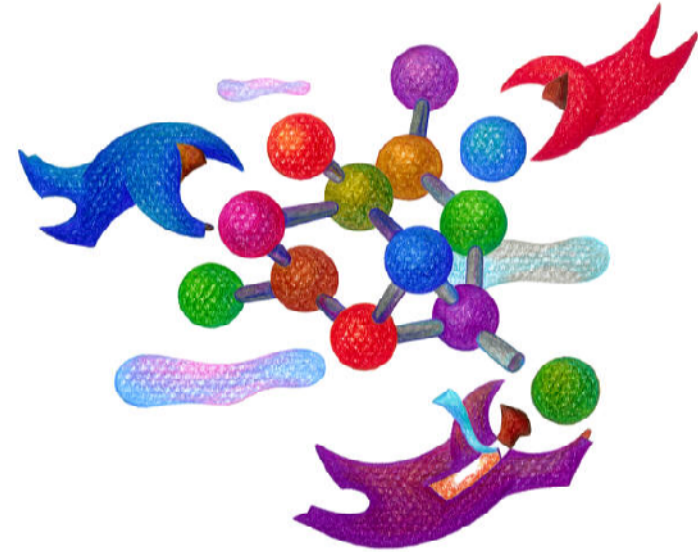
Team of Three (ToT) Concept

- Team of Four and Team of X concept successful at other Raytheon sites

- Adopted the concept at RMS in 2004

- Consistent with integrated product team approach

- Very effective mechanism for process improvement
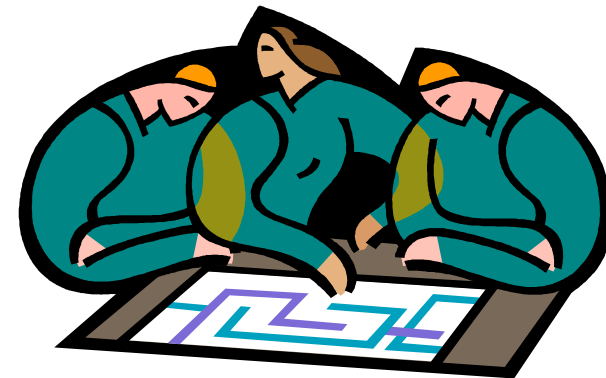
Vehicle for programs to make informed decisions and ensure program success while helping to support the overall organization's business objectives

What is a Team of Three (ToT)?

- A team that supports the program with process deployment and analysis
  - Team goal is to help ensure project success while helping the organization improve over time
  - The team members bring a broad perspective, can better facilitate sharing <u>across</u> projects and help the organization improve as a whole
  - In the spirit of Integrated Product Teams (IPT)
- Also the primary mechanism for process deployment activities on projects
  - Supports the organization's process improvement efforts
- Should not impede Program

Team of Three Members

- Each Team of Three (ToT) consists of (as a minimum):
  - Program Representative: ("Chair") Program Manager, Chief Engineer, or a Senior Integrated Product Team Lead
  - Functional Manager (FM)
    - ❑ Typically a Department Manager (DM)
    - ❑ Systems, "Integration Test &Analysis" are the two primary functional organizations
    - ❑ Radar, Configuration Management, and other Centers can participate
  - Process Representative: R6Sigma Expert or IPDS@RMS Expert

- Additional representatives may attend as needed (from the program or other organizations):
  - Data Management
  - Quality
  - Supply Chain Management

Working as a Team Contributes to Program Success

Team-of-Three
- **Improved Performance**

PROGRAM

- Responsibilities:
  - Chairperson
  - Financial
  - Technical
  - Programmatics
  - Process planning & implementation
  - Metrics collection & analysis

ENGINEERING MGMT

- Functional Management Responsibilities:
  - Project support
  - Resource provider (people, tools, training)
  - Team administration & facilitation
 - Process improvement
  - Cross-project knowledge

PROCESS

- Process Representative Responsibilities:
  - Project support
  - Process expertise & facilitation
  - Data Analysis skills
  - Lessons learned transfer
  - Best practices transfer
  - Process improvement
  - Cross-project knowledge

> ***Responsible for managing the activities for the program***

- Provides the current project status and metrics to the ToT for analysis
- Implements the project's documented process, including adjustments and improvements
- Manages the project plans and process documents
- As chair of the ToT, facilitates team meetings and works to improve team effectiveness
- Ensures meeting minutes are documented and submitted to the Process Assets Library (PAL)
- Ensures documents are under configuration control
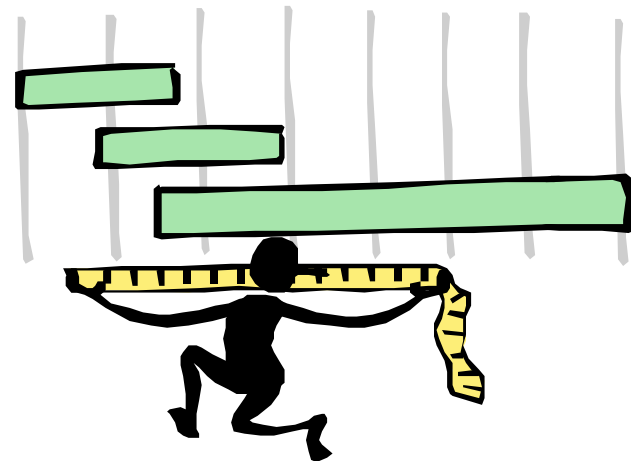
The Functional Manager

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> ## *Responsible for providing adequate resources*
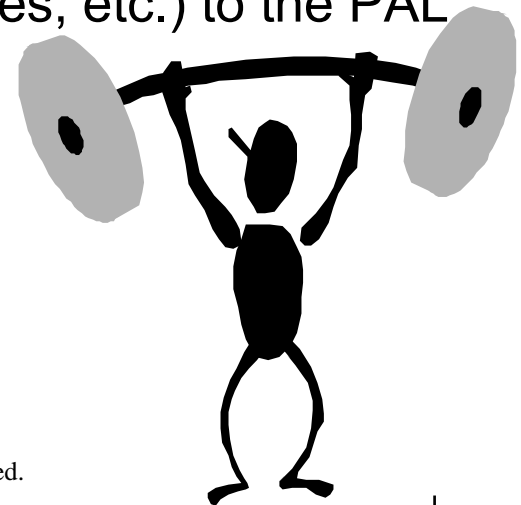> ## *to the program in a timely manner*

- Provides organizational resources to the project
  - Examples: trained staff, standard project tools
  - Good examples of "work products"
  - Not just their "home room" but advocate to all other functions
- Communicates organization goals and objectives
- Provides insight as a "higher level manager" has purview into multiple programs.
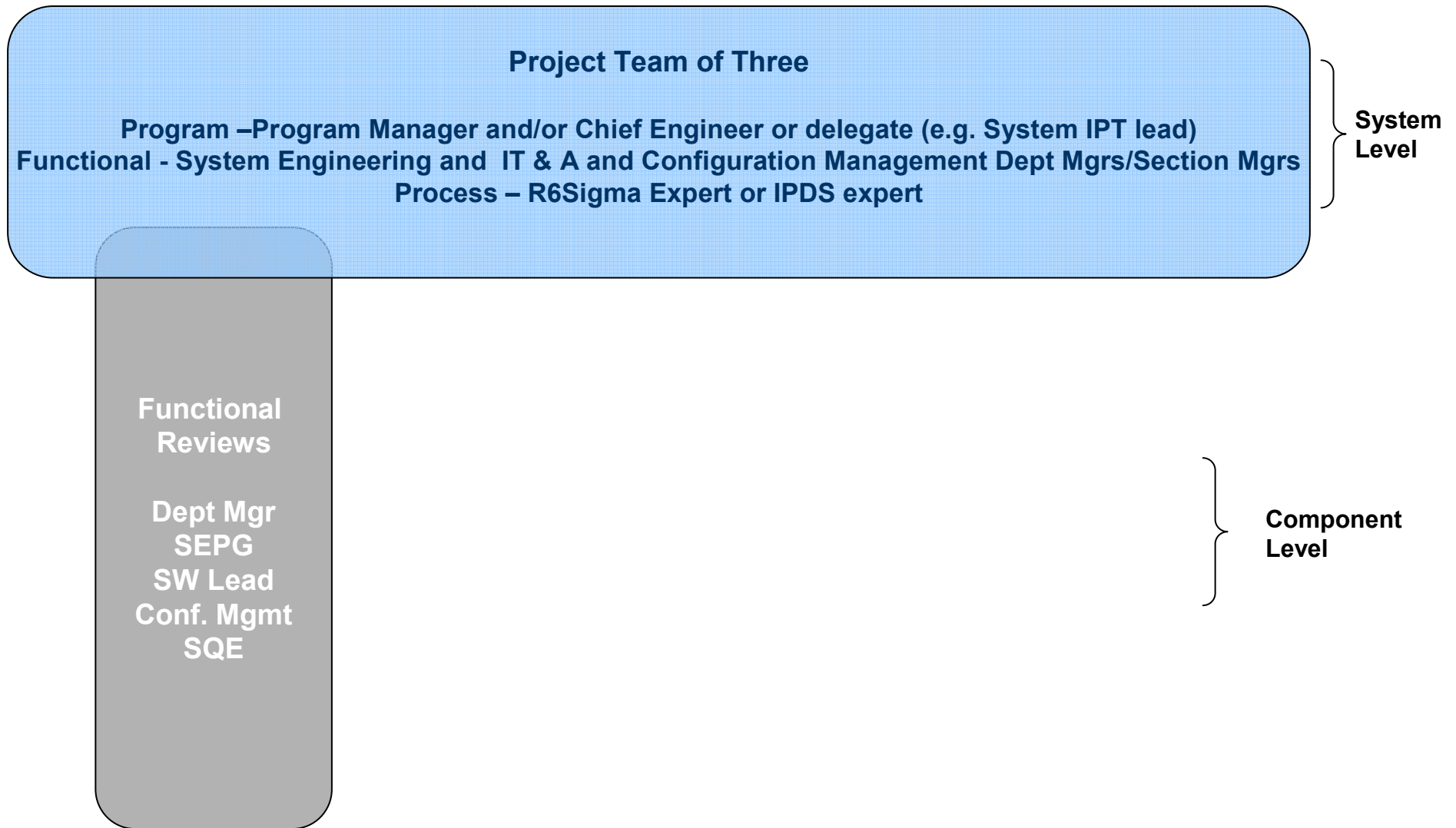
The Process Engineer

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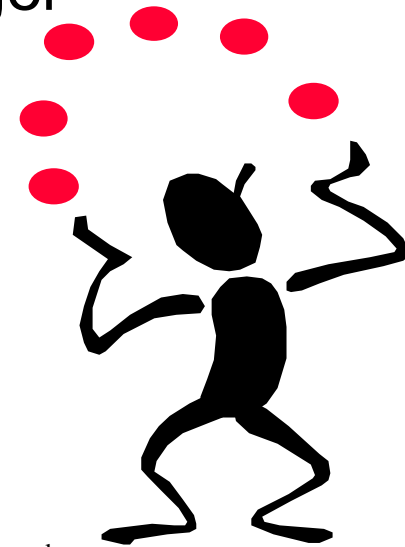
> *Supports process deployment*

- Provides process deployment expertise and assistance
- Provides the organization with a vehicle for sharing lessons learned and process changes (when necessary and appropriate)
- Facilitates process-related problem resolution and process improvement efforts
- Assists with evidence/artifact collection and support of project evaluations
- Submits project data (lessons learned, best practices, etc.) to the PAL for use by other projects
- May assist program with preparation & review of project plans and process documents
  - Supplies process expertise
  - Makes process improvement recommendations
  - Ensures both organizational and project goals are considered in Tailoring Report

Team of Three

Project Team of Three

Program –Program Manager and/or Chief Engineer or delegate (e.g. System IPT lead)
Functional - System Engineering and IT & A and Configuration Management Dept Mgrs/Section Mgrs
Process – R6Sigma Expert or IPDS expert

System Level

Functional Reviews

Dept Mgr
SEPG
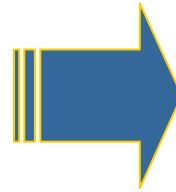**SW Lead**
**Conf. Mgmt**
SQE

Component Level

ToT Adds Value

- **Better visibility of key drivers (e.g., Productivity and other measures)**
- **Collaborative risk mitigation**
- **Timely resolution of issues (more proactive, less reactive)**
- **Eliminates wasted activities (no "reinventing the wheel")**

→ ■ **Improved Program Performance**

- **Institutionalized processes**
- **In-Phase containment of defects**
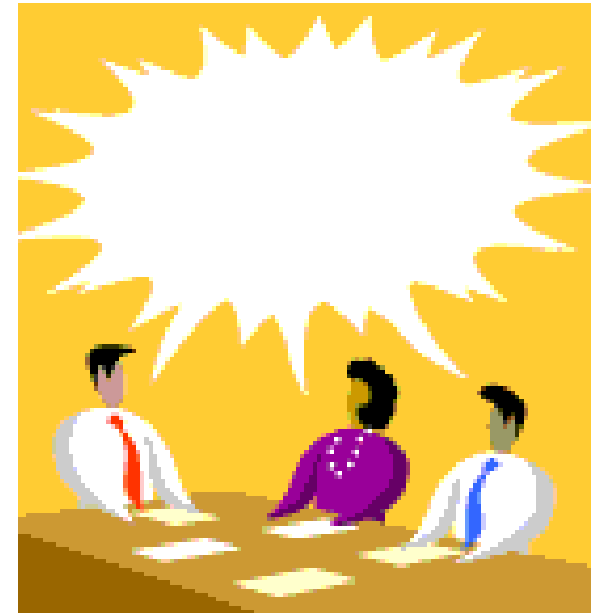- **Shared Lessons Learned and Best Practices**
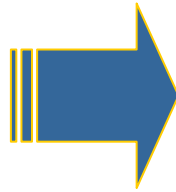
→ ■ **Improved Process/Product Quality**

Stronger Tie between Programs and Functional Organizations

More Successful IPTs

More Predictable Programs

ToT Process Improvement

- Address activities identified in the program's process improvement plan
- Seek process improvements for areas identified in quantitative management
- Sponsor Process Action Teams on the program
- Identify lessons learned and best practices to share with rest of organization
- Review other programs lessons learned and best practices and determine if they should be applied to this program
- Prepare for appraisals, customer reviews, and audits

Organization Process Teams

Project Team
Program Management,
Chief Engineer,
IPT leads

Team of Three (ToT)
Functional Management,
Program Representative,
Process representative

Enterprise Process Group
EPG rep
Measurement and Analysis Team
Engineering Process Council

- Define & deploy the project's process
- Collect & analyze metrics
- Implement process improvements
- Manage project using the metrics
- Develop mitigation plans in response to unexpected results

- Analyze metrics for stability, trends & improvement opportunities (org, product line & project)
- Assign resources to key issues
- Assure compliance to process standards

- Review project metrics package
- Assure key issues are being addressed
- Provide management support to projects
- Publish IPR (sum of project's metrics packages)

Benefits of Effective Teams of Three

- Improved process
  - Better tailoring and deployment
- Improved communication/collaboration
- More consistency across projects
- Shared lessons learned for use on other programs
- Better product quality
- Improved competitiveness
- Promotes higher maturity processes

"Working as a Team Fosters Program Success"

Why do all this?

- IPDS @ RMS provides an organizational plan and template on measures, monitoring and control, lessons learned, review of program and process data with a functional representative

- CMMI Level 3 looks for an organization process that has been deployed on the programs
  - Measurement Analysis is looking for a disciplined approach to metric selection ("goal-question-metric" philosophy)
  - Program Monitor and Control
  - Generic Practice 2.8 – Process Monitor and Control
  - GP 2.10 – Review Status with Higher Level Mgmt
  - GP 3.2 - Collect Improvement Information

Using the Team of Three for CMMI evidence

- For Program evidence requirements, the Team of Three proved extremely useful.
- Each program was required to provide evidence for up to 15 different process areas.
- GP 2.8 Monitor and Control the Process
  - Monitor and control the measurement and analysis process against the plan for performing the process and take appropriate action.
  - GP 2.8 was satisfied (metrics package and minutes) in all 15 process areas.
- GP 2.10 Review Status with Higher Level Management
  - Review the activities, status, and results of the measurement and analysis process with higher level management and resolve issues.
  - Satisfied in 13 PA's from Team of Three evidence.
- GP 3.2 Collect improvement Information
  - Collect work products, measures, measurement results, and improvement information derived from planning and performing the measurement and analysis process to support the future use and improvement of the organization's processes and process assets.
  - Team of Three was a major contributor for GP 3.2 evidence in all PA's.

Questions?

Thank you for your participation!