Systems Engineering Basics: Experience and Lessons Learned can be as Important as Knowledge and Education

Karl C. Geist
INCOSE/DAU Certified ESEP-Acq
ICI Services Corporation

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Topics

• Lessons Learned: Win or lose, document
• Resource Estimating: The good, the bad, and the wild “?” guess
• Metrics: Waste of time or way of life?
• Project Management: How to increase failures, raise expectations
• Process Definition: What to follow, processes or “common sense”
• Management Methods: Do you delegate or not delegate, that is the question
• Communications: Can you hear me, can you hear me now?
• Risk and Opportunity Management: Knowing the unknown unknowns
• Personnel Management: Are people our most important resource
• Secret Ingredient to Product Success
Lessons Learned:

• Win or lose, document!
• Sharing success and failure (Lessons Learned) helps create a win – win environment
  o Collaboration – team unity
  o Isolation – team uncertainty
• Your successes can provide
  o Paths for future success
  o Reinforcement of skills and abilities
• Your failures can provide
  o Insight to solutions for unsuccessful path or methods
  o Clarity to the weaknesses in the decision making process
  o Examples to avoid production of unnecessary products
• Documenting Process and Results provides at a minimum, a know place to start
• Best Lessons to Learn are from Other People’s Mistakes
• If You are not making Decisions, You can’t make Mistakes
Resource estimating

- The good, the bad, and the wild “?” guess!
- Nothing replaces Experience when it comes to Estimating, even if it is not your own
- Good estimates come from proven models and/or historic results
- Bad estimates come from lack of “experience, knowledge/understanding of complexity
- Wild “?” guess stems from unrealistic expectations
- All Estimates provide value
  - Good estimates provide reinforcement of process
  - Bad estimates can be used to help find flaws in process
- No Estimate is “Wrong” by definition
Metrics

• Way of Life or Waste of Time?
• Both Options are supportable because of collecting too many or the wrong ones
• Metrics are measurement of success and failure
• Methods of analysis required for correct results interpretation
• Necessary
  o Track costs
  o Support Schedule
  o Determine Productivity
  o Meet Requirements
• Unnecessary
  o Too many metrics
  o Poor analysis
  o Intent
Project Management

• How to increase failures, - raise expectations?
• Requirements Creep, - must plan to control changes
• Schedule driven programs, - more apt to fail
• Process Limitations, - tailoring processes for task
• Just say “no”, because you can’t please everyone
• As requirements increase so does the time and/or resources (scope, schedule, cost)
• As funding (cost) or development time (schedule) decrease, so does content (scope)
• Understand Team Talent and use it!
Process Definition

• What to follow, processes or “common sense”?
• Process is a tool or enabler not the solution
• Process improvement is part of task not solution
  o Process complexity ties to task complexity
  o Tailor to fit the needs
  o Tailor to improve product/process but not save time or cut corners
  o Document as you use / be wise when implementing change
• Learn from failures by changing process
• Justifiable decisions when lead by process
• What is the true value of “Level 3”?
Management Methods

• Do you delegate or not to delegate, that is the question

• Delegation can be a **key to success**
  o Delegate responsibility and authority
  o Maintain oversight

• Developer responsible for decision process is also then accountable for its outcome

• Empowerment can
  o Improve quality
  o Increase efficiency
  o Improve and increase productivity

• Manager in the loop, not the bottleneck
• Oversee the budget, not your personnel
Communications

• Can you hear me, can you hear me now!
• Maintain lines of communication
• Exercise them regularly
• Successes and failures affect more than one part of the system
• Successes may free up mitigation options or solutions
• Failures eliminate some options
• Maintain open lines with all Team members
• Report issues or problems with solution options
Risk and Opportunity Management

• Knowing the unknown unknowns
• Risk is identifying the issues that can be costly to the program’s success
• Risk is based on probability and impact
• Admitting certain things can cause program failure, is the first step in finding a solution
• Finding options for solution or mitigating impact is the key. Failures eliminate options
• Opportunity is identifying those things that can aid in the program’s success
• “Gambling” is knowing what risks to solve and what risks to accept
Personnel Management

• Are people you most important resource?
• Training personnel can be less expensive than replacing them
• Replacing Personnel can result
  o Degradation of productivity (learning curve)
  o Loss of corporate knowledge
• Team continuity and stability
• Team only as strong as its weakest member
• Success breeds success
  o Personnel raise their performance to the challenge facing them when coming from success
Secret Ingredient to Product Success

• What is the Secret Ingredient: Culture
• Culture many times overlooked by SEs and PMs
• Understanding the customer’s culture can be the difference between failure and success
• Sometimes customer's culture establishes priorities
• Navy East Coast vs West Coast Training
• Eastern Europe Airport Security Scanner
• Transportations Issues Air vs Water
• Facility Development Mistakes
Questions or Thoughts?

Karl C. Geist
INCOSE/DAU Certified ESEP-ACQ
karl.geist.ctr@navy.mil
301-862-4000 x306