



New CMM Math

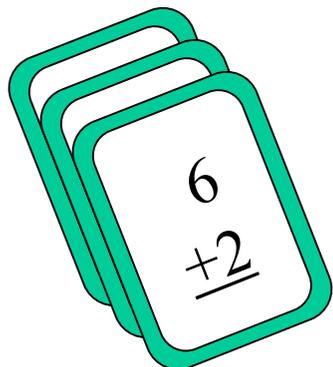
Jack Ferguson - SEI
M. Lynn Penn - Lockheed Martin M&DS

STC 2002
Salt Lake City, Utah

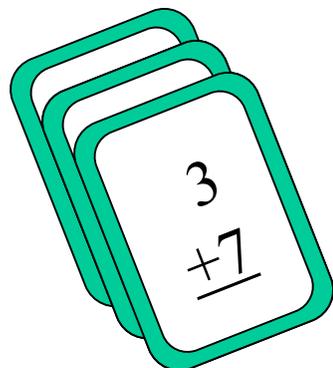


Agenda

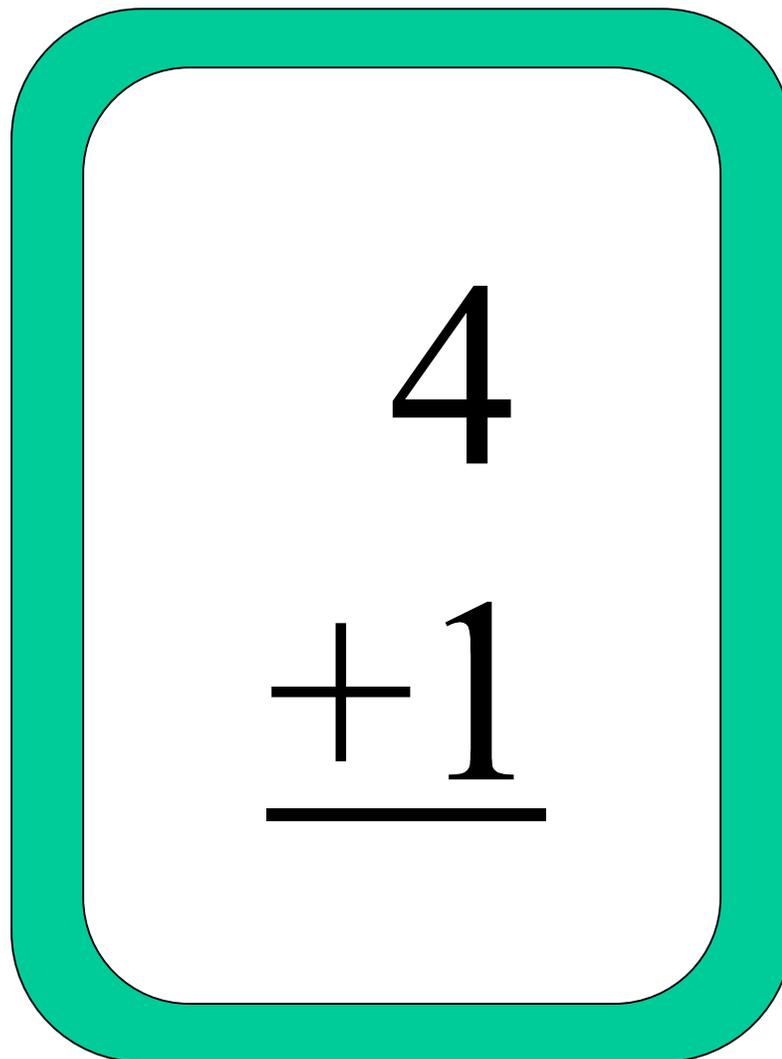
- **Case 1 - Joint Projects**
 - multiple companies teamed on one project as one team
 - Scenario 1 - One high maturity, One low maturity
 - Scenario 2 - Two high maturity
- **Case 2 - Corporate Acquisitions & Mergers**
 - multiple companies must exist as one company (multiple ratings)
- **Case 3 - Prime with Multiple Expert Subs**
 - multiple companies must complete one project
 - wide range of maturity levels
- **Case 4 - Mature Developer and Immature Acquirer**
 - key players must direct one project from different disciplines



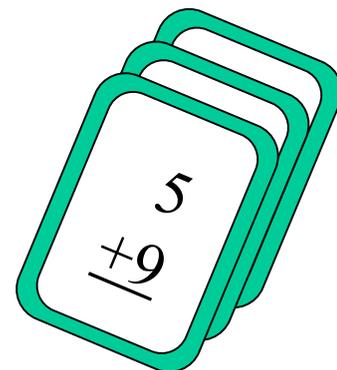
6
+2



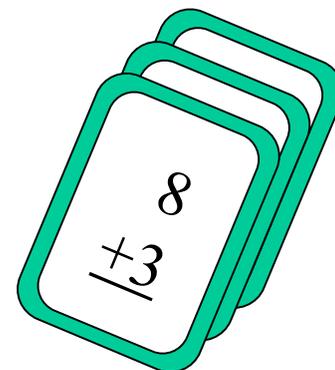
3
+7



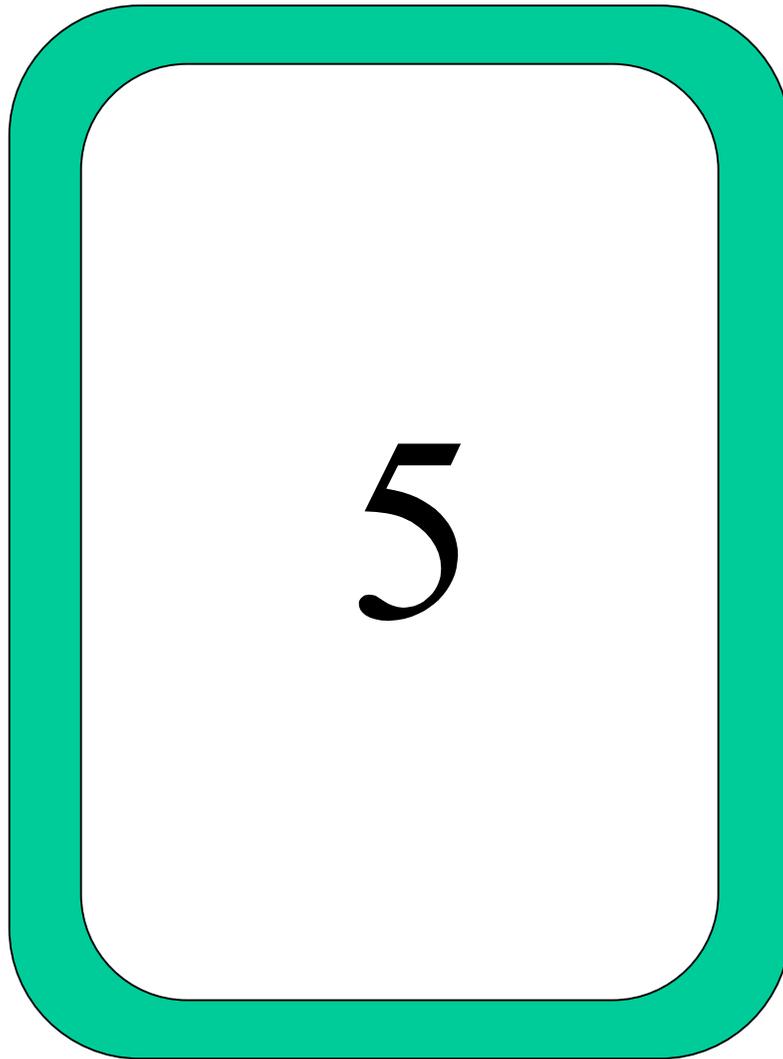
4
+1



5
+9



3
+8



Not
Quite !!



Case 1 - Joint Projects

- **Situation - Scenario 1**
 - 2 or more companies teamed on one project
 - one high maturity (**Level 4**) / one low maturity (**Level 1**)
 - IPT structure
 - Company identities go away - badgeless environment
 - Project becomes the new “organization”



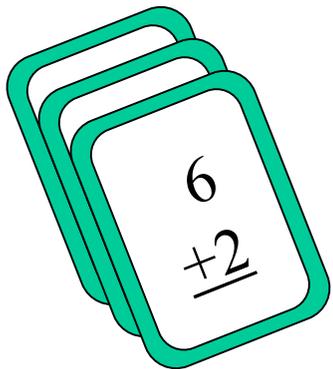
Case 1 - Joint Projects

- **Problems - Scenario 1**
 - Common Terminology
 - Defects
 - Peer reviews/ walkthroughs/ inspections
 - Metrics
 - Processes Bid
 - Company's bid work based on performance to their organization's process standards
 - Company's do not bid training to processes / or familiarization to new processes (with the exception of unique tool adoption)

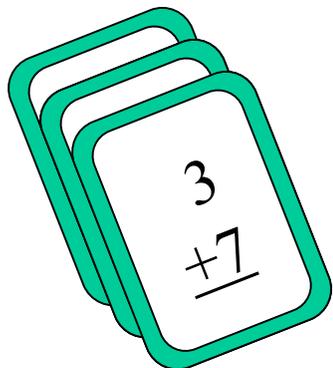


Case 1 - Joint Projects

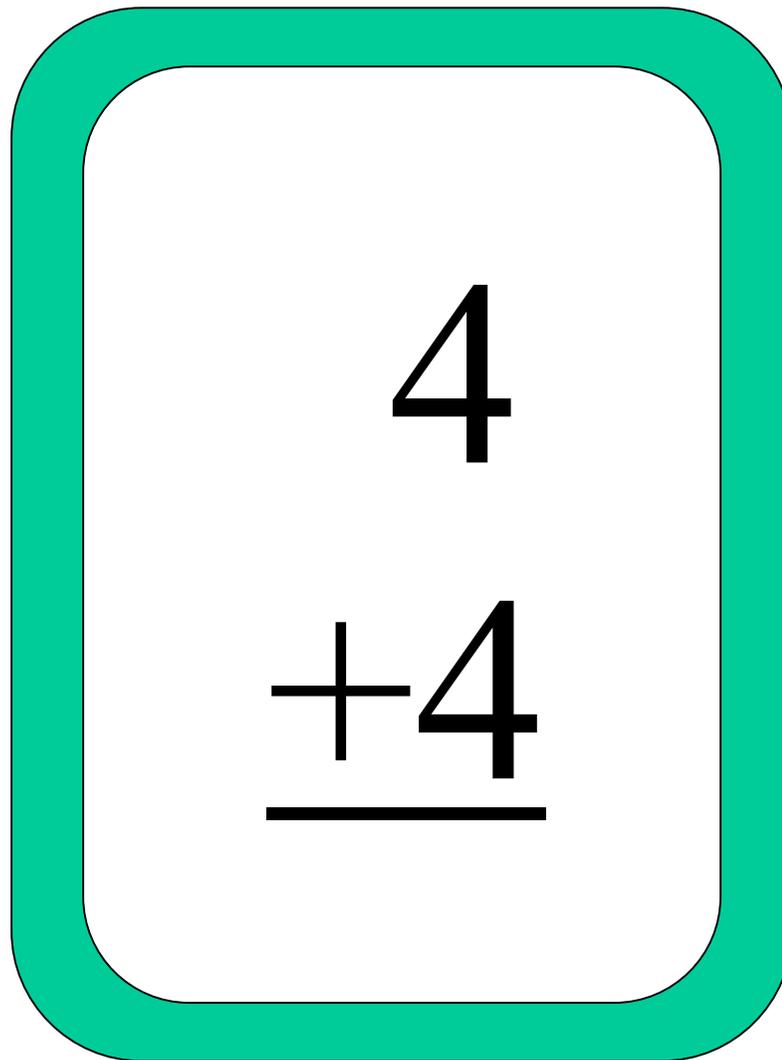
- **Recommendations - Scenario 1**
 - Set up a Project Process Group
 - Map individual company standards to each other
 - identify similarities
 - identify gaps
 - Establish a Project Process Standard
 - utilize the best of the best
 - adopt high maturity elements to fit project needs
 - e.g. causal analysis at end of increments versus end of life cycle phases (less frequency versus less rigor)
 - Use Team Software Process (TSP) to develop standard



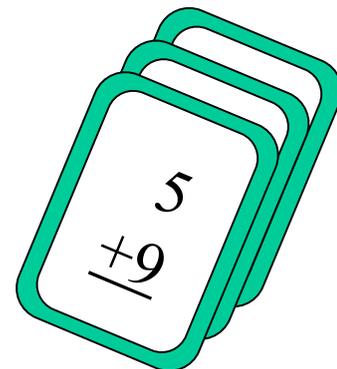
6
+2



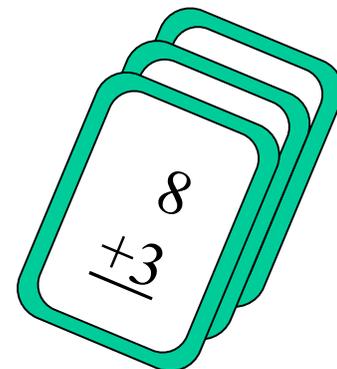
3
+7



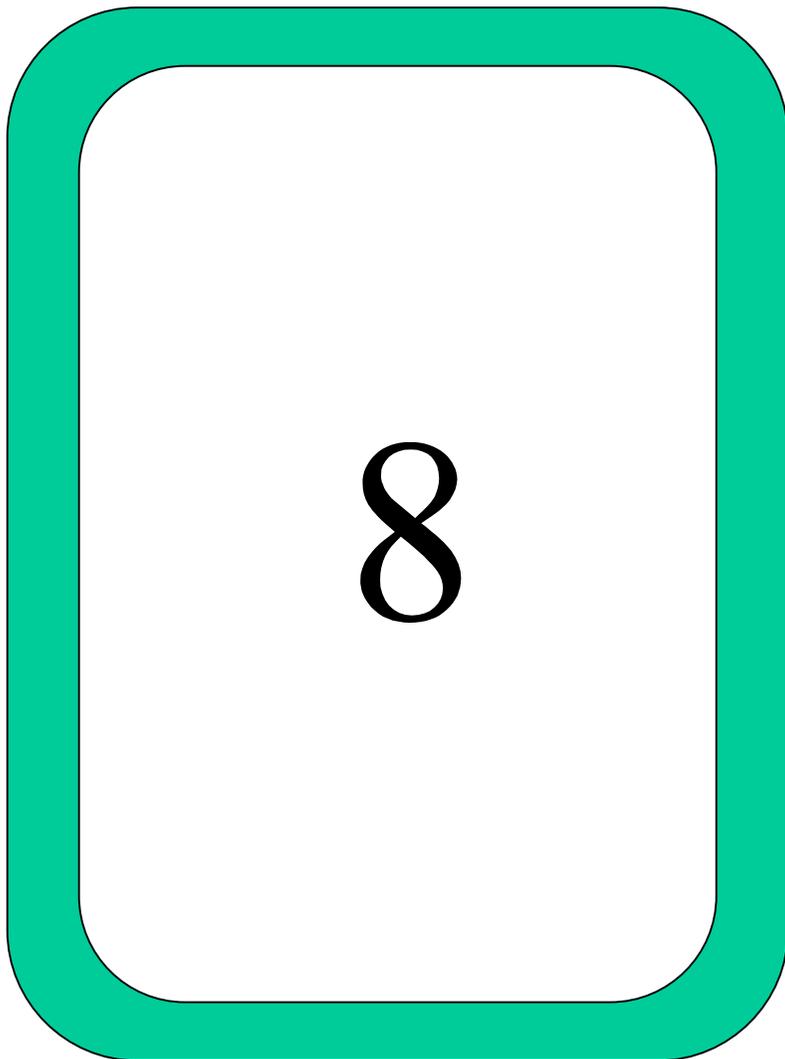
4
+4



5
+9



3
+8



Not
Quite !!
4 ≠ 4



Case 1 - Joint Projects

- **Situation - Scenario 2**
 - 2 or more companies teamed on one project
 - both high maturity (**Level 4**)
 - IPT structure
 - Company identities go away - badgeless environment
 - Project becomes the new “organization”



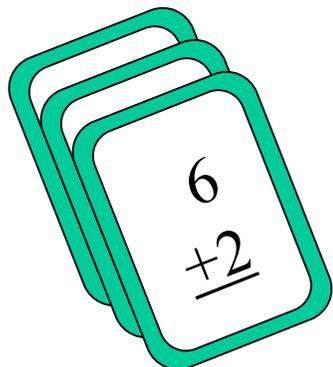
Case 1 - Joint Projects

- **Problems - Scenario 2**
 - Common Terminology - based on interpretation
 - Defects
 - Peer reviews/ walkthroughs/ inspections
 - Metrics
 - Levels and requirements are not the same (different assessors, different practice examples)
 - Process Standards not the same
 - Processes Bid
 - Company's bid work based on performance to their organization's process standards
 - Company's baseline specific to their process interpretation

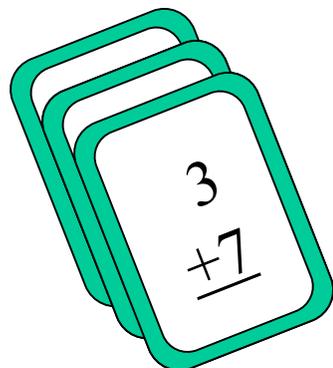


Case 1 - Joint Projects

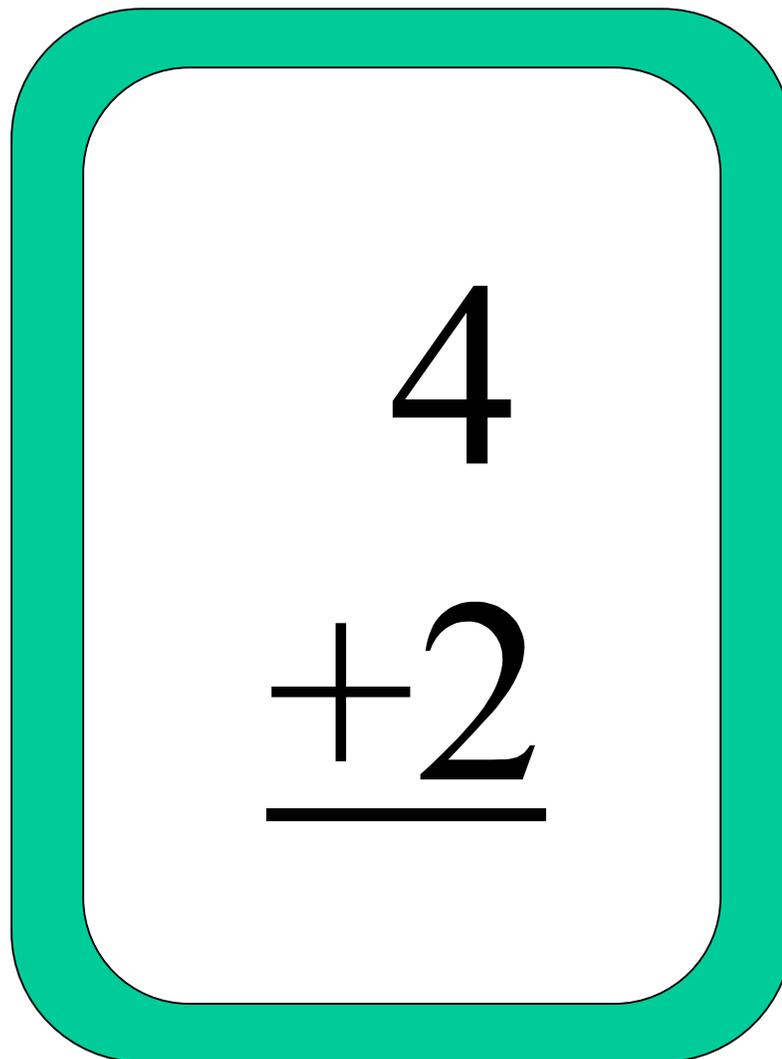
- **Recommendations - Scenario 2**
 - Set up a Project Process Group
 - Map individual company standards to each other
 - Identify interpretations
 - Map compliance issues
 - Establish a Project Process Standard
 - Utilize the best of the best
 - Use TSP to develop standard



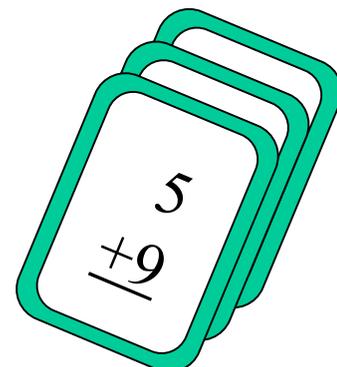
6
+2



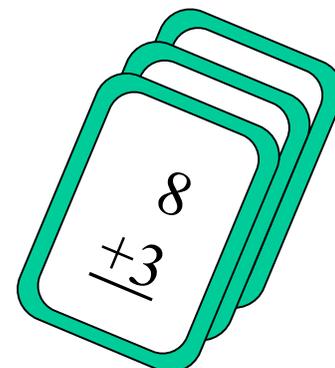
3
+7



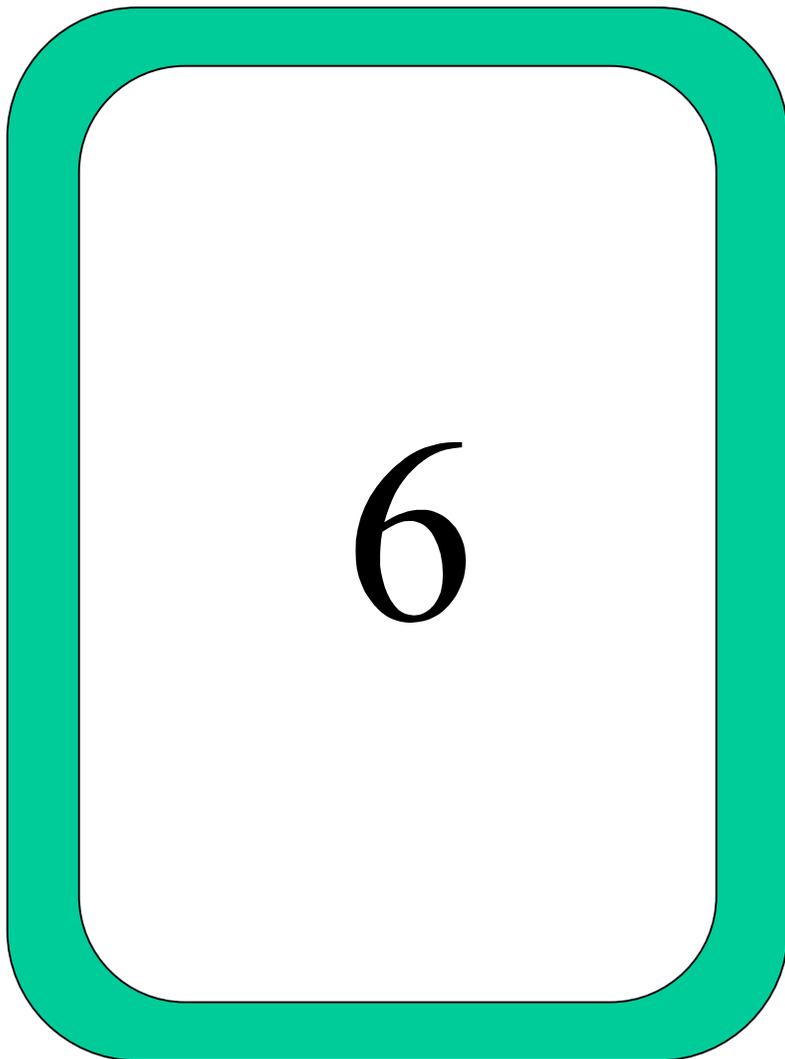
4
+2



5
+9



3
+8



Not
Quite !!



Case 2 - Corporate Acquisitions & Mergers

- **Situation**

- Trying to merge two or more different organizations
 - Different maturity levels (**Level 4 & Level 2**)
 - Different cultures
 - Different customers
- Added requirement that now they are “ONE” permanently
 - Goal - seamless integration



Case 2 - Corporate Acquisitions & Mergers

- **Problems**
 - Different reporting requirements
 - Senior management changes
 - How much information goes forward
 - New tool sets (labor hour reporting, training, performance management, metrics collection, CM, PM...)
 - Decision Making
 - Management changes warrant different delegation of authority
 - When can you say “NO”
 - When is an idea really being solicited



Case 2 - Corporate Acquisitions & Mergers

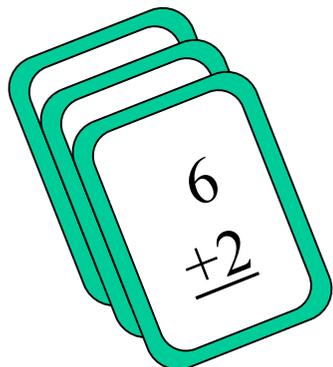
- **Problems (continued)**
 - Evaluation for source selection
 - Software Capability Evaluations (SCE)
 - new standard as proposed versus organizational standard previously used
 - Identification of transition risks
 - Different customer sets and expectations
 - Customer satisfied (award fees high) with current process
 - Need to make change not apparent and not funded



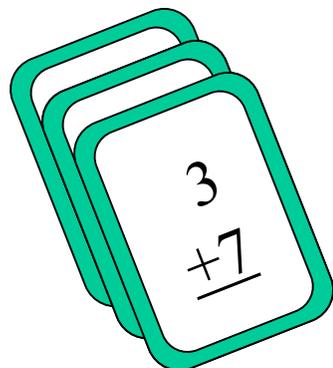
Case 2 - Corporate Acquisitions & Mergers

- **Recommendations**

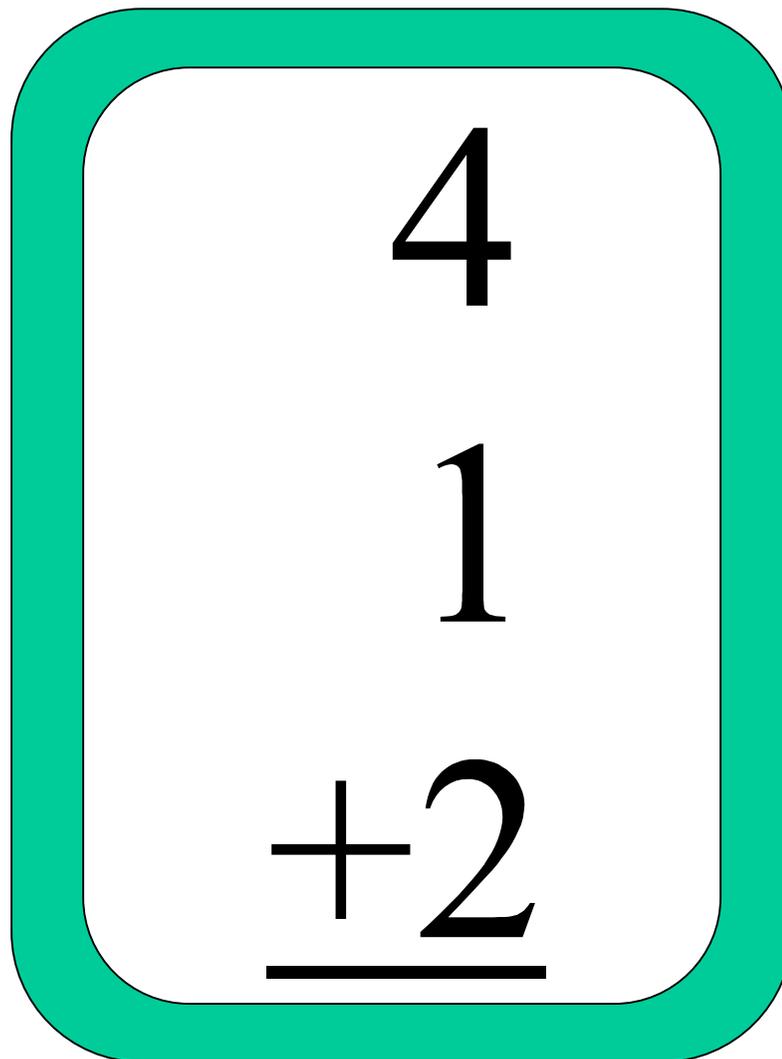
- Review organizational Process Standards
 - Recommend finding Lowest Level of Commonality
 - Try not to lose maturity but may raise requirements in order to meet
 - leave the how up to the individual “companies”
 - New organization should structure standard around the “WHAT”
- Define contents of new Process Asset Library
 - Change names so everyone feels part of a “new” organization (e.g. policies versus directives)
 - Build a Joint Team with equal representation to define/ write/ structure process assets
 - Determine hard date for organization to roll over to new processes



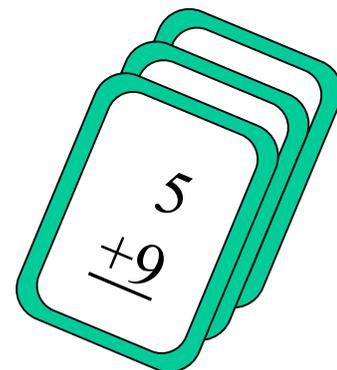
6
+2



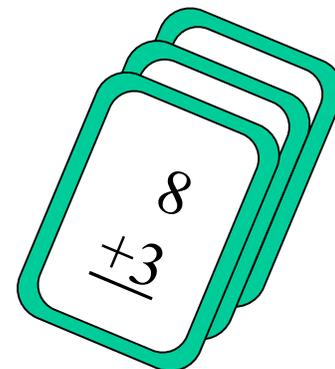
3
+7



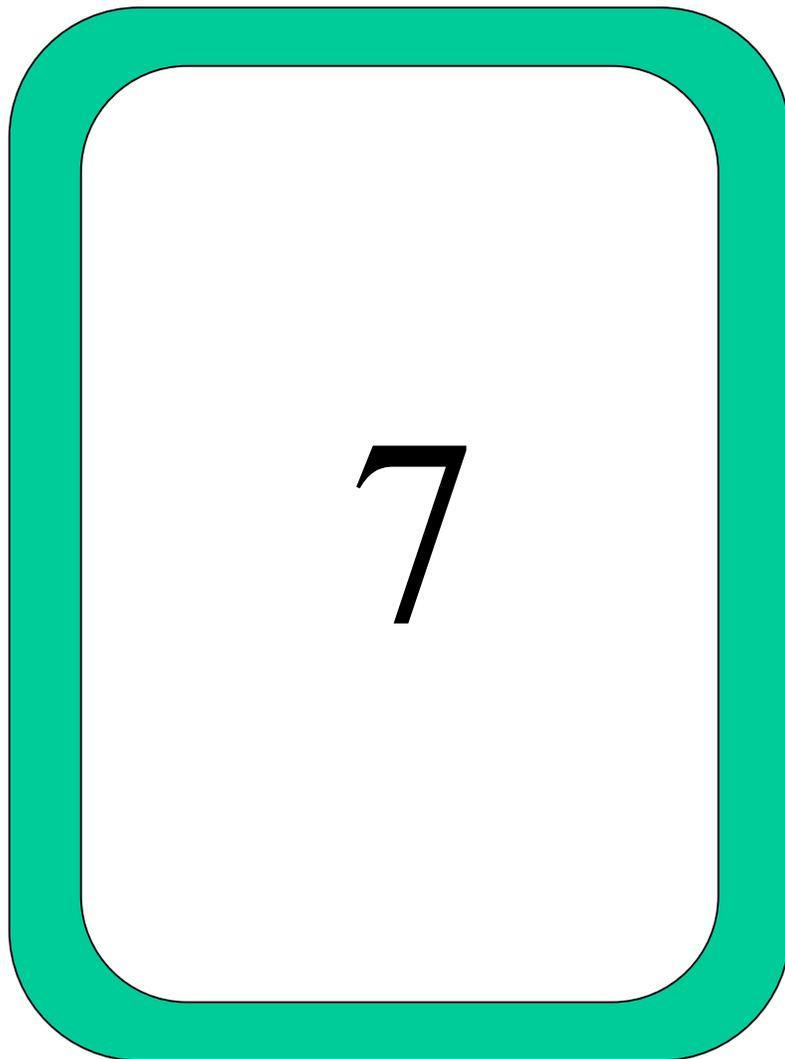
4
1
+2



5
+9



8
+3



Not
Quite !!



Case 3 - Prime with Multiple Expert Subs

- **Situation**
 - Prime with multiple domain expert subs
 - multiple levels prime (**Level 4**), sub 1 (**Level 1**), sub 2 (**Level 2**)
 - Prime has chosen or been forced to use subs because of their expertise/ political connections
 - Project must capitalize on culture/ expertise and NOT CHANGE IT



Case 3 - Prime with Multiple Expert Subs

- **Problems**
 - Reporting Requirements
 - subs senior management
 - prime
 - customer interface
 - Decision Making/ Risk Management
 - recognize responsibilities of home organization versus membership in project team
 - Definitions and interpretation
 - terminology
 - consistency within similar levels and acceptance of different levels



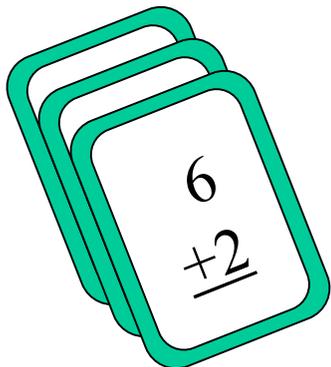
Case 3 - Prime with Multiple Expert Subs

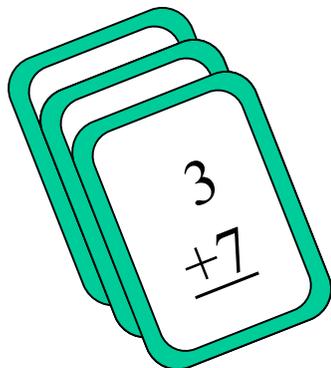
- **Problems (cont.)**
 - Marginal commitments
 - success of project
 - overall cost/ schedule
 - customer satisfaction
 - Future competition issues/ proprietary issues
 - reluctance to share processes or divulge process implementation to prime
 - Weakest link can drive performance

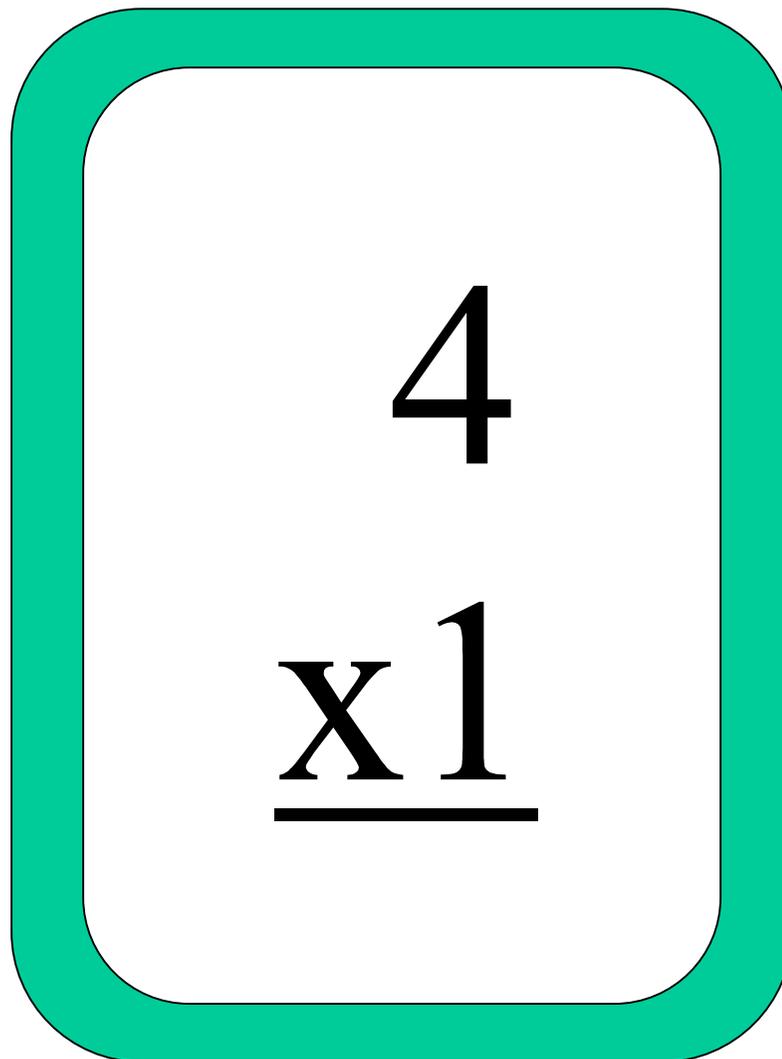


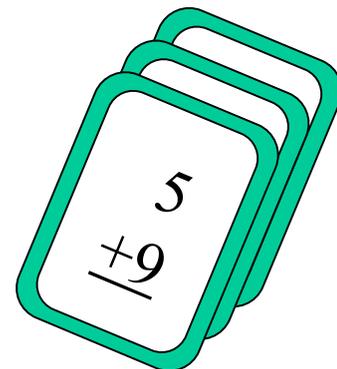
Case 3 - Prime with Multiple Expert Subs

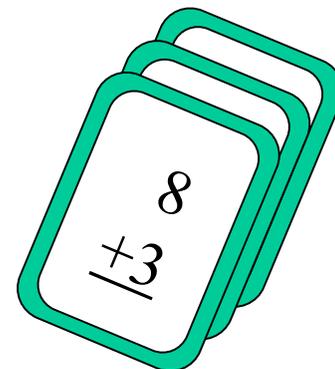
- **Recommendations**
 - Prime should allow subs to follow own process
 - giver/ receiver relationship
 - common process for managing interfaces, risks, CM and V&V
 - insight to potential risks and changes
 - implement strong Supplier Agreement Management and IPPD concepts or interfaces

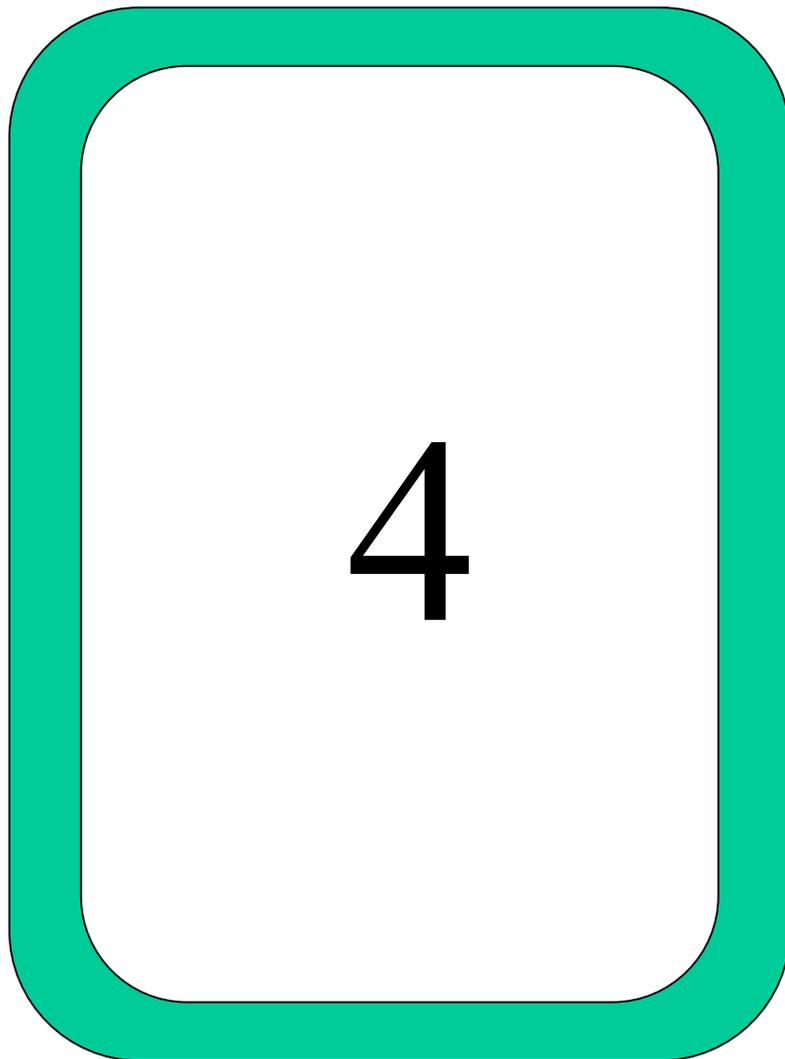

$$\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$$


$$\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$$


$$\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$$


$$\begin{array}{r} 5 \\ +9 \\ \hline \end{array}$$


$$\begin{array}{r} 3 \\ +8 \\ \hline \end{array}$$



Not
Quite !!



Case 4 - Mature Developer and Immature Acquirer

- **Situation**

- Immature acquisition agency (**Level 1**) awards contract to a mature developer organization (**Level 4**)
- Initially impressed with ability to perform/ basis of estimate/ cost and schedule projects
- Lack of understanding of the importance of the process adoption on the quality and production of product



Case 4 - Mature Developer and Immature Acquirer

- **Problem**
 - Schedule and budget dictated, not developed
 - Unconstrained requirements direction and changes
 - importance of requirement development and requirements management not understood by the acquirer
 - Conflicting direction as to process implementation
 - acquirer does not see need
 - home organization requires process be complied with
 - Lack of appreciation/ understanding of high maturity practices
 - metrics beyond Cost/ Schedule not applied
 - causal analysis of no benefit to this contract
 - Results in unrealistic schedule and budget



Case 4 - Mature Developer and Immature Acquirer

- **Recommendation**

- Incentivize acquirer to improve
 - maintenance side should be in competition in order to instill a desire to improve
 - compete programs among acquirers (different offices)
 - set up policy to improve
 - more software acquisition education and training
 - develop Return On Investment for acquisition process improvement
 - show worth of their effort to improve
 - build business cases



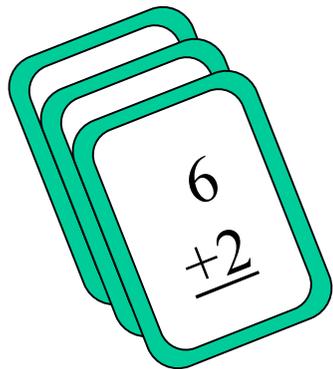
Case 4 - Mature Developer and Immature Acquirer

- **Recommendation (cont.)**
 - Developers
 - say no
 - educate and train acquirer
 - put acquirers on team as IPT members - use them
 - invite to participate in inspections
 - members of process groups, review boards, risk management boards, trade studies
 - use real data for requirements flow/ change
 - negotiate functionality/ trade offs as change requests are received

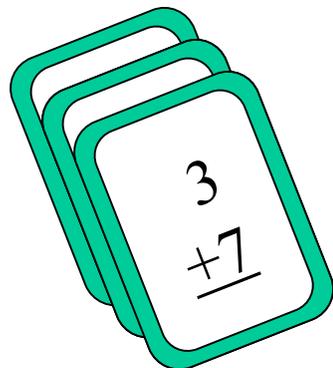


General Recommendations

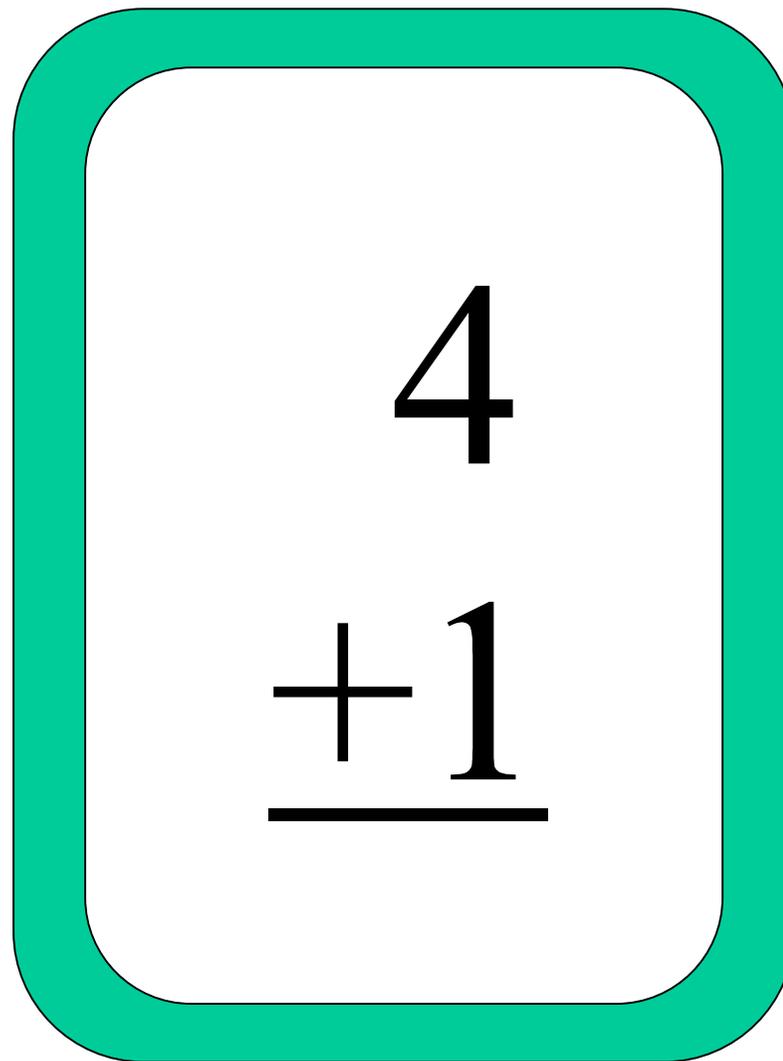
- **Look Beyond Own Borders**
 - Investigate the best of the best
 - Be willing to change
- **Adopt CMMI**
 - Common Language
 - Framework includes - software, systems engineering, acquisition, IPPD



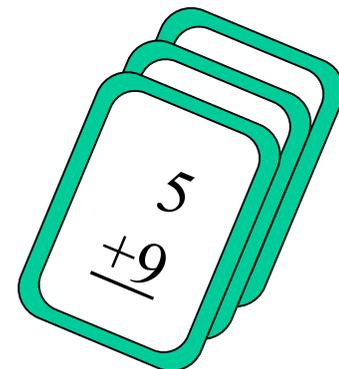
6
+2



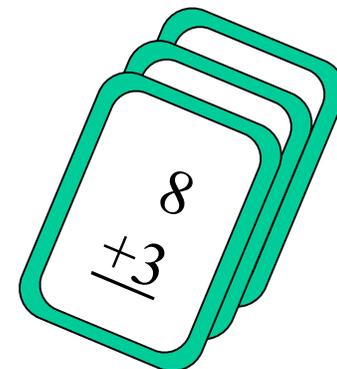
3
+7



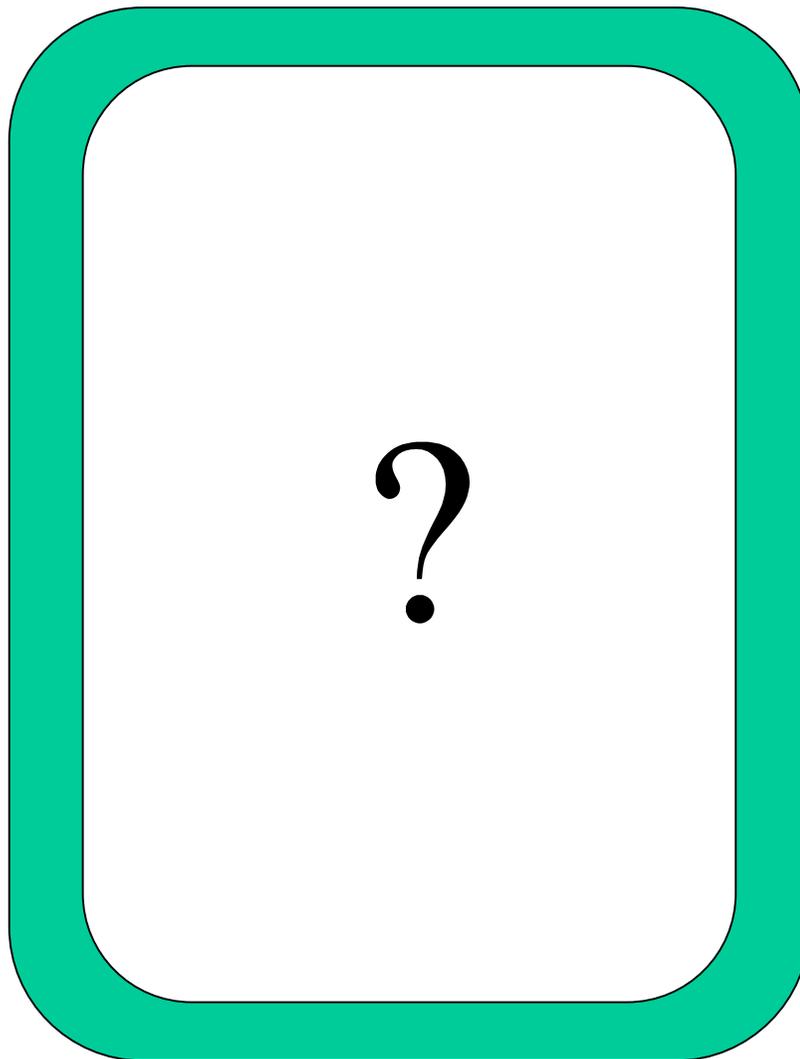
4
+1



5
+9



8
+3





Contacts

Jack Ferguson

Software Engineering Institute

jrf@sei.cmu.edu

M. Lynn Penn

Lockheed Martin Management & Data Systems

mary.lynn.penn@lmco.com