



ATLAS Shrugged

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(with apologies to Ayn Rand and John Galt)

ATLAS

- “Ask The Lead AppraiserS”
- A scenario-based email forum used to elicit opinions on “interesting” topics
- Distributed to all 400+ LAs and 1500+ non-LAs
- Limited to one page
- Multiple choice format - ample room for comments
- Results are compiled and published by PACT with no intellectual property rights retained
- SEI is just another recipient of the data – they do not sponsor or influence ATLAS in any way.

ATLAS Scenarios

Scenario number (# LA's / # non-LA's)

#1 – Bidirectional traceability (46/45)

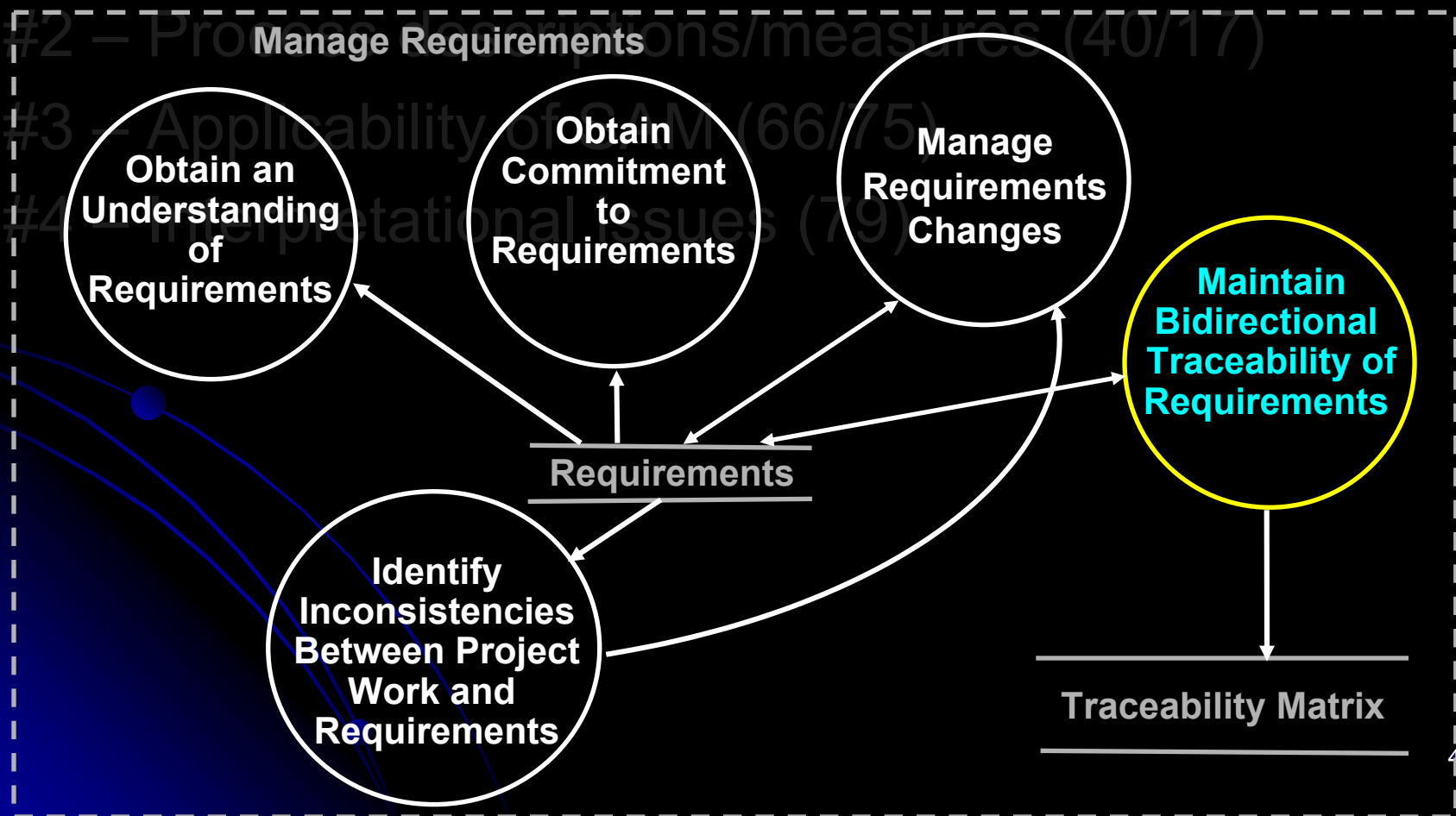
#2 – Process descriptions/measures (40/17)

#3 – Applicability of SAM (66/75)

#4 – Interpretational issues (79)

ATLAS Scenarios

#1 – Bidirectional traceability (46/45)



ATLAS #1 – Bidirectional Traceability

- A project in a SCAMPI A appraisal is:
 - estimated to be 30,000 person hours
 - 14 months into its 18 month schedule
 - preparing to initiate system testing
- No alternative practices for this project.

Question 1

1. For this project, which selection best represents your view of model expectations with respect to REQM SP1.4?
 - A. Vertical and horizontal traceability
 - B. Either vertical or horizontal traceability
 - C. Only vertical traceability
 - D. Only horizontal traceability
 - E. Other

Answer 1: Model Expectations

| Selected choice: | Leads | Non-Leads |
|-----------------------------------|--------------|------------------|
| A: Vertical and horizontal | 70% | 84% |
| B: Vertical or horizontal | 13% | 0% |
| C: Vertical only | 13% | 11% |
| D: Horizontal only | 0% | 4% |
| E: Other/None | 4% | 0% |

Question 2

2. What characterization (FI, LI, PI, NI) is most appropriate if there is:
- A. ___ Ample evidence of vertical traceability but no evidence of horizontal traceability?
 - B. ___ Ample evidence of horizontal traceability but no evidence of vertical traceability?

Answer 2a - Characterizations

Ample evidence of vertical traceability
but no evidence of horizontal traceability

| Selected choice: | Leads | Non-Leads |
|------------------|-------|-----------|
| A. FI | 20% | 15% |
| B. LI | 39% | 32% |
| C. PI | 36% | 47% |
| D. NI | 5% | 6% |

Answer 2b - Characterizations

Ample evidence of horizontal traceability
but no evidence of vertical traceability

| Selected choice: | Leads | Non-Leads |
|-------------------------|--------------|------------------|
| A. FI | 7% | 2% |
| B. LI | 11% | 9% |
| C. PI | 66% | 66% |
| D. NI | 16% | 23% |

Question 3

3. For each of the following, please indicate if you consider it to be:
- A. Vertical Traceability
 - B. Horizontal Traceability
 - C. Neither
 - D. Both
 - E. I don't have a clue! (Don't know)

Answer 3a – Traceability Type

High-level business requirements
are traceable to feature requirements

| Selected choice: | Leads | Non-Leads |
|-------------------------|--------------|------------------|
| A: Vertical | 95% | 86% |
| B: Horizontal | 5% | 2% |
| C: Neither | 0% | 0% |
| D: Both | 0% | 12% |
| E. Don't Know | 0% | 0% |

Answer 3b – Traceability Type

Traceability is maintained among interdependent functional requirements

| Selected choice: | Leads | Non-Leads |
|-------------------------|--------------|------------------|
| A: Vertical | 4% | 9% |
| B: Horizontal | 82% | 74% |
| C: Neither | 2% | 2% |
| D: Both | 9% | 16% |
| E. Don't Know | 2% | 0% |

Answer 3c – Traceability Type

Each of the 500+ system test cases lists the specific requirement(s) being tested

| Selected choice: | Leads | Non-Leads |
|------------------|-------|-----------|
| A: Vertical | 78% | 67% |
| B: Horizontal | 16% | 21% |
| C: Neither | 2% | 4% |
| D: Both | 4% | 9% |
| E. Don't Know | 0% | 0% |

Note: Traceability ACROSS the life cycle is “vertical;”
And we wonder why there are interpretational issues!

Answer 3d – Traceability Type

System requirements are traceable to the group(s) to which they are allocated

| Selected choice: | Leads | Non-Leads |
|-------------------------|--------------|------------------|
| A: Vertical | 51% | 32% |
| B: Horizontal | 29% | 39% |
| C: Neither | 16% | 14% |
| D: Both | 0% | 16% |
| E. Don't Know | 4% | 0% |

Answer 3e – Traceability Type

Technical requirements are traceable to specific elements in the WBS

| Selected choice: | Leads | Non-Leads |
|-------------------------|--------------|------------------|
| A: Vertical | 51% | 40% |
| B: Horizontal | 29% | 35% |
| C: Neither | 16% | 16% |
| D: Both | 4% | 7% |
| E. Don't Know | 0% | 2% |

ATLAS #1 Note

- The SEI's website contains answers to "Frequently Asked Questions" (FAQ)
- Bidirectional traceability is covered:
 - <http://www.sei.cmu.edu/cmml/faq/new-faq.html#Q318>
 - See partial text on next slide
- Only 1 of nearly 100 respondents (a lead appraiser) mentioned the SEI FAQ!

SEI FAQ regarding Traceability

Vertical traceability identifies the origin of items (e.g., customer needs) and follows these same items as they travel through the hierarchy of the WBS to the project teams and eventually to the customer. When the requirements are managed well, traceability can be established from the source requirement to its lower level requirements and from the lower level requirements back to their source.

Horizontal traceability is also important, but it is not required to satisfy bidirectional traceability. Horizontal traceability identifies the relationships among related items across work groups or product components for the purpose of avoiding potential conflicts. For example, horizontal traceability would follow related requirements across two work groups working on two associated components of a product.

ATLAS Scenarios

#1 – Bidirectional traceability (46/45)

#2 – Process descriptions/measures (40/17)

#3 – Applicability of SAM (66/75)

#4 – Interpretational issues (79)



ATLAS #2: Process Descriptions

When conducting a ML2 appraisal, the organization has no documented process descriptions, and organizational personnel corroborate this.

Question 1

Would you document a weakness regarding the lack of process descriptions? _____

| | <u>Yes</u> | <u>No</u> |
|-----------------|------------|-----------|
| Lead Appraisers | 79% | 21% |
| Non-Leads | 87% | 13% |

Do you perceive this to be a goal-threatening weakness? _____

| | <u>Yes</u> | <u>No</u> |
|-----------------|------------|-----------|
| Lead Appraisers | 65% | 35% |
| Non-Leads | 73% | 27% |

ATLAS #2: Metric Specifications

When conducting a ML2 appraisal the organization employs project and product measures, but no process measures. Organizational personnel corroborate this.

- They DO plan and track the process activities associated with REQM, PP, PMC, etc., but they have not implemented any process measures as suggested by the GP2.8 example boxes.

Question 2

Would you document a weakness regarding the lack of process measures? _____

| | <u>Yes</u> | <u>No</u> |
|-----------------|------------|-----------|
| Lead Appraisers | 51% | 49% |
| Non-Leads | 80% | 20% |

Do you perceive this to be a goal-threatening weakness? _____

| | <u>Yes</u> | <u>No</u> |
|-----------------|------------|-----------|
| Lead Appraisers | 18% | 82% |
| Non-Leads | 53% | 47% |

ATLAS #2 – How Much Is Enough?

When conducting a ML2 appraisal, the org has specified only 4 measures: SLOC, Earned Value, Peer Review Defects, and Test Defects. The specifications are complete and cover all of the MA SG1 specific practices.

In addition to the 4 specified measures, the org and projects capture and use many more measures, but no specs exist for these additional measures.

Org personnel contend that the specified measures are those that were most recently introduced (throughout the past year). The unspecified measures were already well-established and used consistently.

Question 3

Would you document a weakness regarding the limited number of specified measures? _____

| | <u>Yes</u> | <u>No</u> |
|-----------------|------------|-----------|
| Lead Appraisers | 70% | 30% |
| Non-Leads | 53% | 47% |

Do you perceive this to be a goal-threatening weakness? _____

| | <u>Yes</u> | <u>No</u> |
|-----------------|------------|-----------|
| Lead Appraisers | 27% | 73% |
| Non-Leads | 33% | 67% |

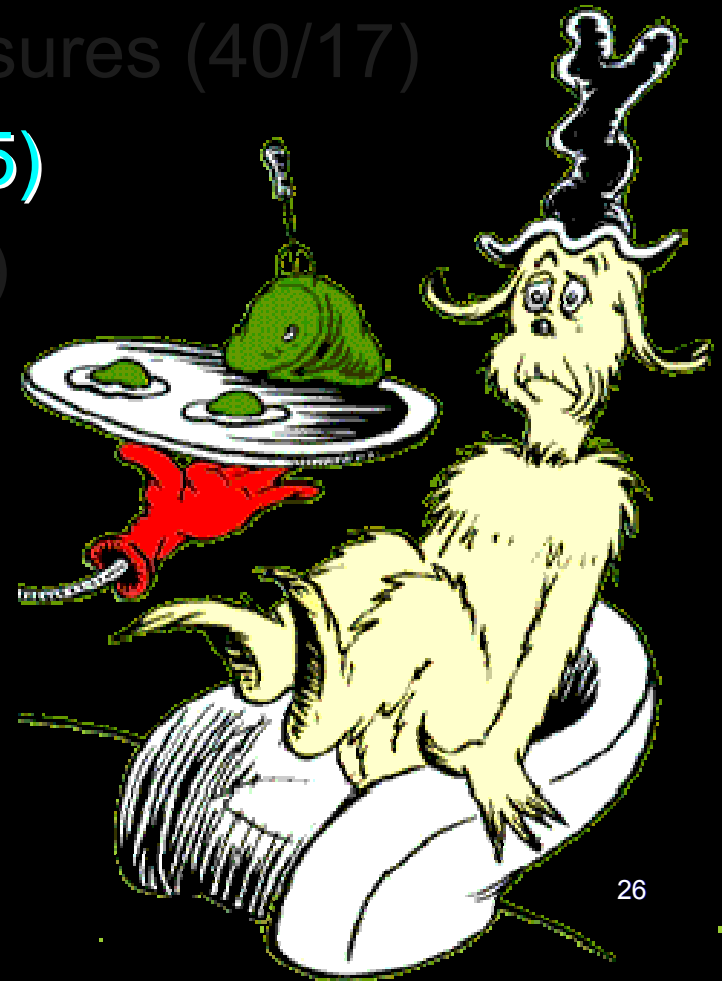
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ATLAS #3, Scenario 1

The project team is incorporating an “Open Source” component. The source code was posted on the originator’s website with an indication that it can be used without restriction, free of charge and “at your own risk.”

- The originator also indicated she retains no intellectual property rights with respect to the component, nor any responsibility for its ongoing support/maintenance.

Question 1

Must SAM be applied with respect to the Open Source component? _____

| | <u>Yes</u> | <u>No</u> |
|---------------------|------------|-----------|
| Lead Appraisers | 35% | 65% |
| Non-lead Appraisers | 19% | 81% |

ATLAS #3, Scenario 2

The customer's SOW requires that you incorporate an unmodified version of component X which is available solely from Company Y.

- According to the SOW, the customer will negotiate X's acquisition cost, maintenance fees, and license fees with Company Y.

Question 2

Must SAM be applied with respect to Company Y? _____

| | <u>Yes</u> | <u>No</u> |
|---------------------|------------|-----------|
| Lead Appraisers | 28% | 72% |
| Non-lead Appraisers | 34% | 66% |

Must SAM be applied with respect to the customer? _____

| | <u>Yes</u> | <u>No</u> |
|---------------------|------------|-----------|
| Lead Appraisers | 50% | 50% |
| Non-lead Appraisers | 64% | 36% |

ATLAS #3, Scenario 3

The solution that your very small company intends to provide to your customer includes a laser jet printer supplied by Very Big Company.

It is off-the-shelf and no modifications are required.

Question 3

Must SAM be applied with respect to Very Big Company? _____

| | <u>Yes</u> | <u>No</u> |
|---------------------|------------|-----------|
| Lead Appraisers | 52% | 48% |
| Non-lead Appraisers | 51% | 49% |

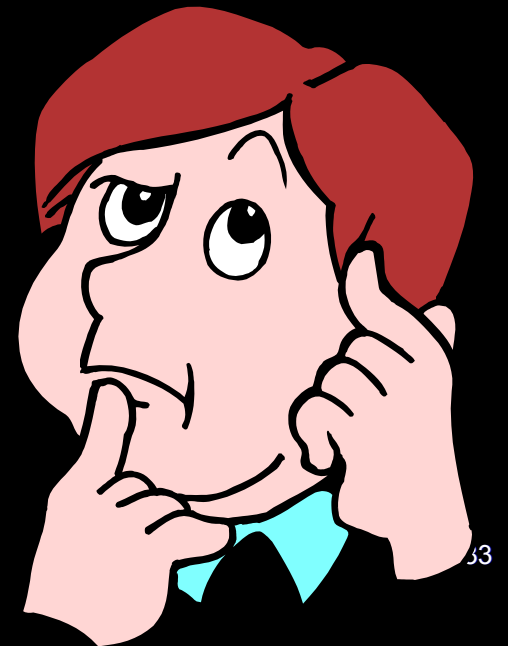
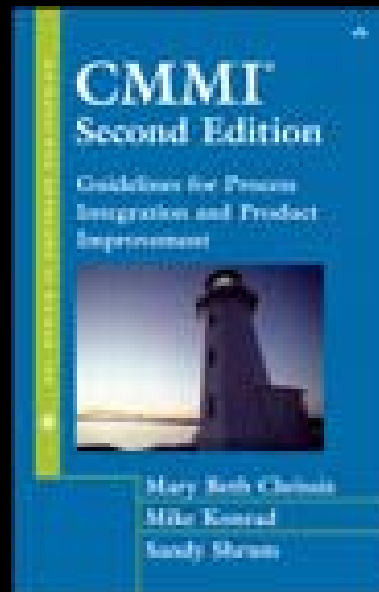
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ATLAS #4 – Interpretational Issues

- Which 3 ML2 specific practices are most likely to encounter interpretational issues?

Interpretational Issues - ML2 Response Data by Rank

| PA | Practice | Practice Title | Number of ML2 Respondents | Percent of ML2 Respondents | Rank within ML2 | Cum. % of ML2 Responses |
|------|----------|---|---------------------------|----------------------------|-----------------|-------------------------|
| REQM | SP 1.4-2 | Maintain Bidirectional Traceability of Requirements | 43 | 54% | 1 | 18% |
| PP | SP 2.3-1 | Plan for Data Management | 21 | 27% | 2 | 27% |
| MA | SP 1.1-1 | Establish Measurement Objectives | 19 | 24% | 3 | 35% |
| PP | SP 1.2-1 | Establish Estimates of Work Product and Task Attributes | 16 | 20% | 4 | 41% |
| CM | SP 3.2-1 | Perform Configuration Audits | 16 | 20% | 4 | 48% |

ATLAS #4 – Interpretational Issues

- Which 3 ML3 specific practices are most likely to encounter interpretational issues?

Interpretational Issues - ML3 Response Data by Rank

| PA | Practice | Practice Title | Number of ML3 Respondents | Percentage of ML3 Respondents | Rank within ML3 | Cum. % of ML3 Responses |
|-----|----------|--|---------------------------|-------------------------------|-----------------|-------------------------|
| RD | SP 3.1-1 | Establish Operational Concepts and Scenarios | 12 | 16% | 1 | 6% |
| DAR | SP 1.1-1 | Establish Guidelines for Decision Analysis | 12 | 16% | 1 | 12% |
| TS | SP 1.2-2 | Evolve Operational Concepts and Scenarios | 11 | 15% | 3 | 18% |
| TS | SP 2.2-3 | Establish a Technical Data Package | 11 | 15% | 3 | 24% |
| RD | SP 3.5-2 | Validate Requirements with Comprehensive Methods | 10 | 14% | 5 | 29% |

ATLAS #4 – Interpretational Issues

- Which 3 ML4/5 specific practices are most likely to encounter interpretational issues?

Interpretational Issues - ML4/5 Response Data by Rank

| PA | Practice | Practice Title | Number of ML3 Respondents | Percent of ML3 Respondents | Rank within ML3 | Cum. % of ML3 Responses |
|-----|----------|--|---------------------------|----------------------------|-----------------|-------------------------|
| OPP | SP 1.5-1 | Establish Process Performance Models | 26 | 49% | 1 | 19% |
| QPM | SP 1.3-1 | Select the Subprocesses that Will Be Statistically Managed | 13 | 25% | 2 | 28% |
| QPM | SP 1.2-1 | Compose the Defined Process | 12 | 23% | 3 | 37% |
| OPP | SP 1.4-1 | Establish Process Performance Baselines | 11 | 21% | 4 | 45% |
| OPP | SP 1.1-1 | Select Processes | 10 | 19% | 5 | 52% |

ATLAS #4 – Interpretational Issues

- Which 1 Generic Practice is most likely to encounter interpretational issues?

Interpretational Issues - GP Response Data by Rank

| PA | Practice | Practice Title | Number of ML3 Respondents | Percent of ML3 Respondents | Rank within ML3 | Cum. % of ML3 Responses |
|----|----------|--|---------------------------|----------------------------|-----------------|-------------------------|
| | GP 2.8 | Monitor and Control the Process | 20 | 26% | 1 | 22% |
| | GP 2.2 | Plan the Process | 12 | 16% | 2 | 36% |
| | GP 3.2 | Collect Improvement Information | 11 | 14% | 3 | 48% |
| | GP 2.9 | Objectively Evaluate Adherence | 9 | 12% | 4 | 58% |
| | GP 2.7 | Identify and Involve Relevant Stakeholders | 7 | 9% | 5 | 66% |

Conclusion

- The SEI's lead appraiser upgrade training included a module on model interpretation issues. The conclusion drawn by the SEI Visiting Scientist that authored that section is:

“Model interpretation issues will always exist. For the benefit of the lead appraiser community and that of our constituents, such issues need to be identified, discussed, resolved and communicated.”

Questions?

To be added to the ATLAS distribution list, send an mail to:

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(And don't hesitate to email suggestions for other "interesting" topics!)