The POET Approach

A collaborative means for C2 systems engineering

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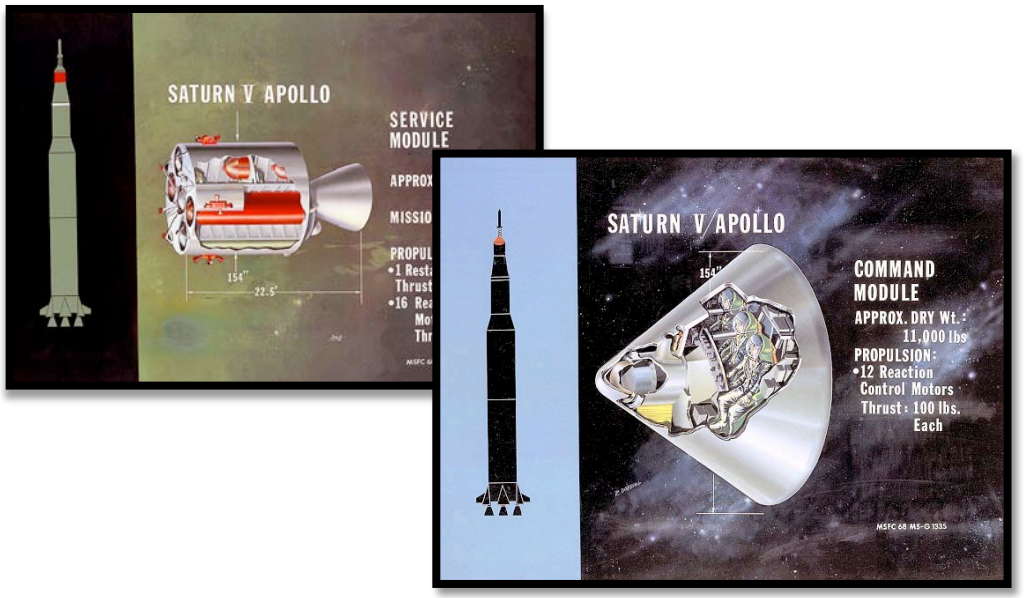
TRADITIONAL SYSTEMS ENGINEERING

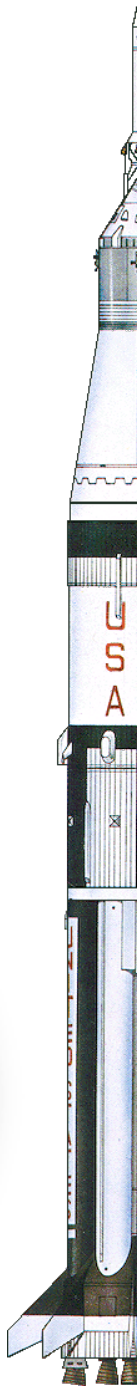
Born in the **Industrial** Age

Decompose, Solve, Recompose!

EXEMPLAR OF SUCCESS

Decompose, Solve, Recompose

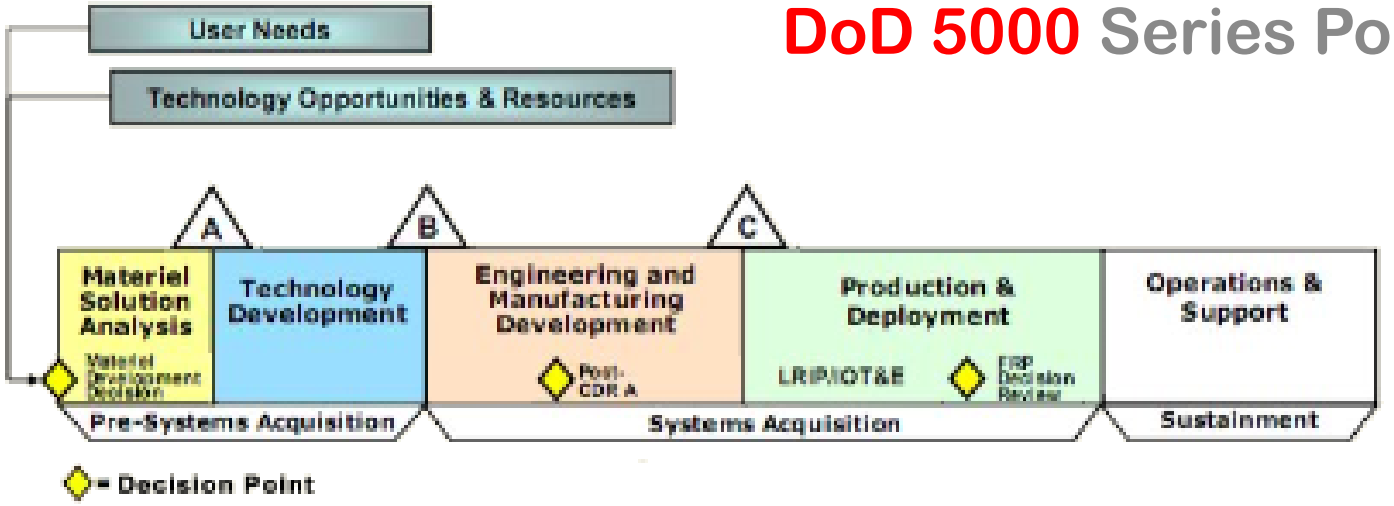




DEFENSE ACQUISITION SYSTEM*

$1.5 *trillion* per year

DoD 5000 Series Policies



DOESN'T WORK WELL FOR IT ACQUISITION

Defense Science Board

National Academies

Problem

- System engineering (SE) efforts continue to flounder despite best efforts of government, warfighters, program managers and contractors
  - Slow
  - Unable to balance disparate stakeholder needs
  - Highly focused on the technical
  - Unresponsive to change
  - Divorced from users' reality

POLITICAL

The political factor is intended to encompass the interactions between **people** and **organizations** as they exercise **power** and **authority** in the context of a program

OPERATIONAL

Operational factors are those that have to do with the execution of **processes** and **activities** among people

ECONOMIC

Economic factors are those that have to do with the distribution and consumption of **money** and **scarce resources** (e.g., labor, office space, funding)

TECHNICAL

The technical factor is comprised of those issues concerned with the production and employment of various **technologies**

POET PATTERNS & COMPLEXITY

Traditional SE is good at handling problems when they are **stable** and **well-defined**

… but such problems are t**he exception**

ADDRESSING THE POLITICAL AND OPERATIONAL IS HARD

Current SE focuses on the technical and economic and downplays the political and operational, where much of the instability lies

THE FIRST STEP

in making good decisions is **understanding**

We need to better understand the **full** range of POET factors

UNDERSTANDING LEADS TO PURPOSEFUL ACTION

Understanding helps stakeholders **self-synchronize** with the group effort

Hidden agendas and misunderstandings are **dangerous** for teams

Importance of Shared Understanding

"The 'Holy Grail' of effective collaboration is creating shared understanding, which is a precursor to shared commitment. If you accept that the crux of effective action is agreeing on what the problem is, then the challenge for organizations is coming to a shared understanding about what their particular dilemma is."

– Jeff Conklin

THE BEST SENSORS WE HAVE ARE OUR STAKEHOLDERS

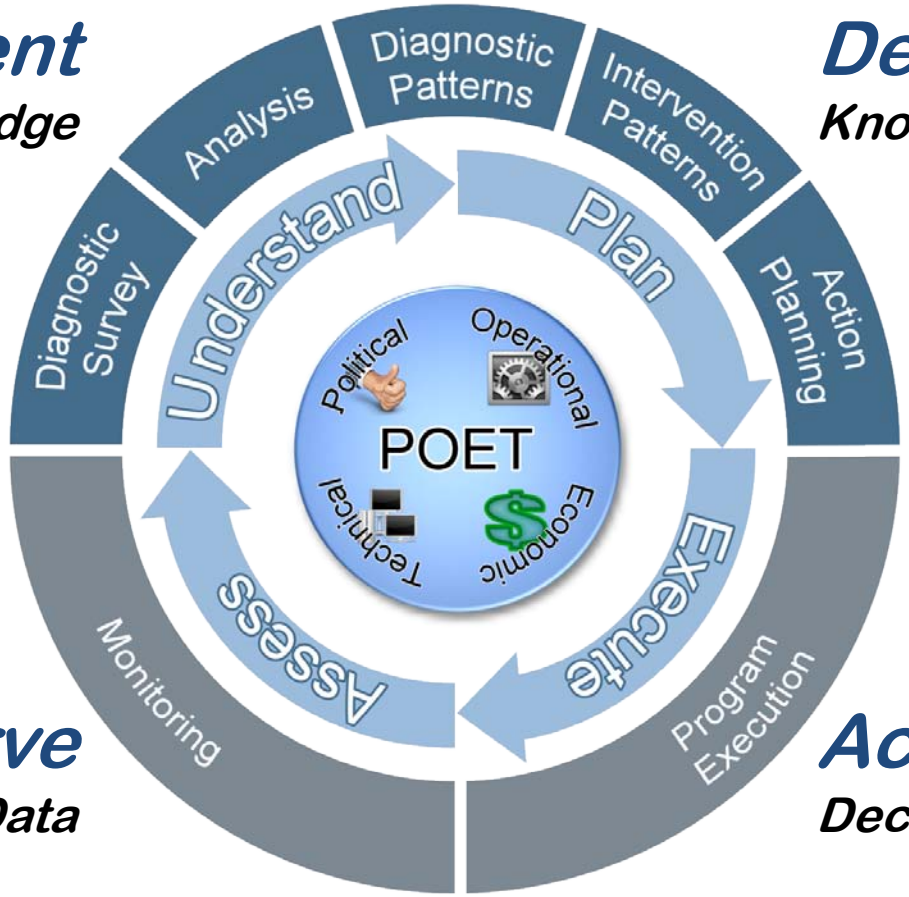
senior decision makers
to program management
to contractors
to outside partners
to end users

POET Process

- Aligned with the OODA Loop

Orient
Data to Knowledge

Decide
Knowledge to Decisions

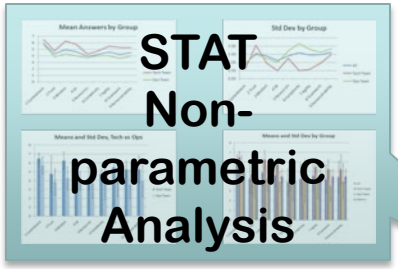


Observe
Actions to Data

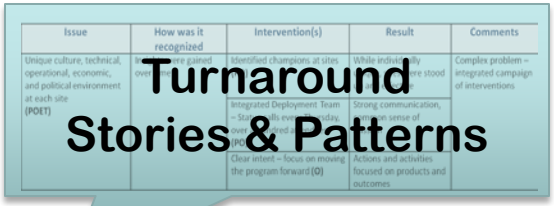
Act
Decisions to Actions

POET Activities

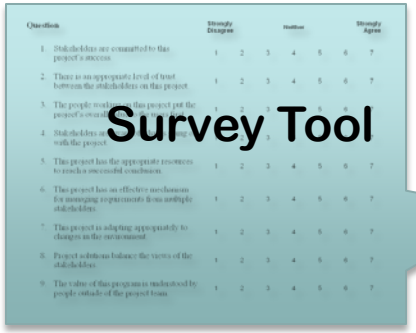
STAT Non-parametric Analysis

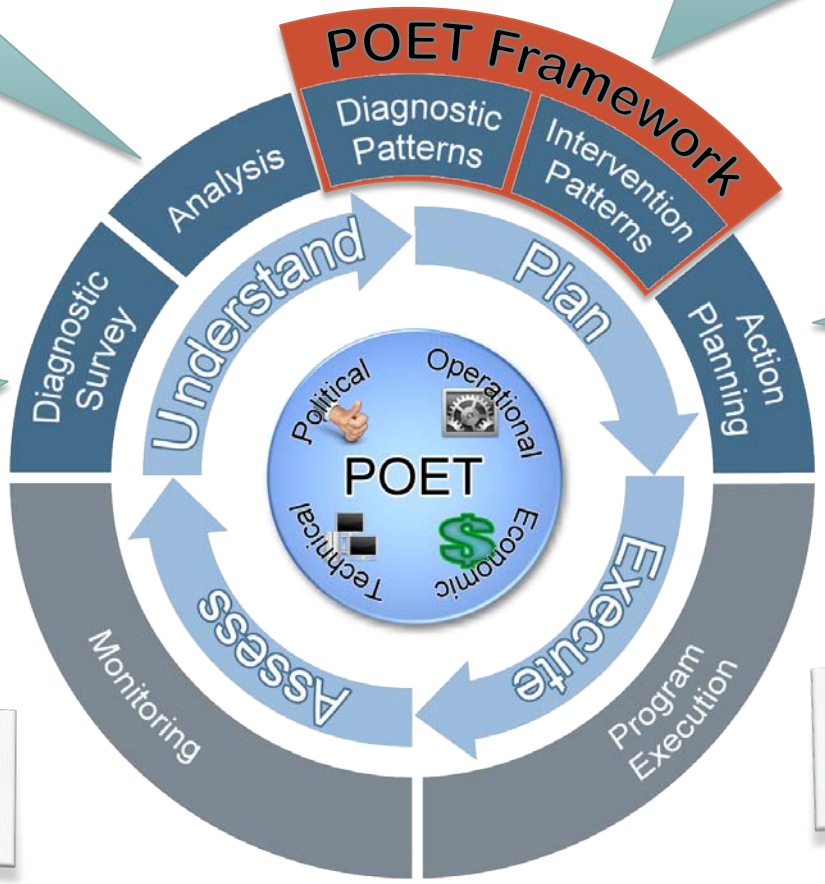


Turnaround Stories & Patterns



Survey Tool





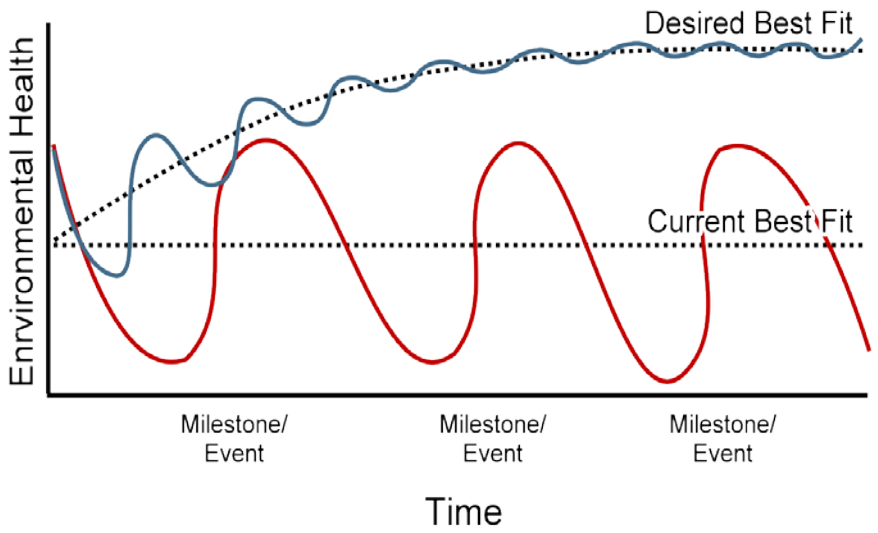
Facilitated Planning Sessions

Monitor program outcomes, milestones and decisions; Feedback into POET Model

Work with sponsor on implementation; Document

POET Process Development

- Collaborative approaches are proven way to deal with “wicked” problems
- Develop simple, scalable and repeatable process
- Iterative engagement
- Improvements over time



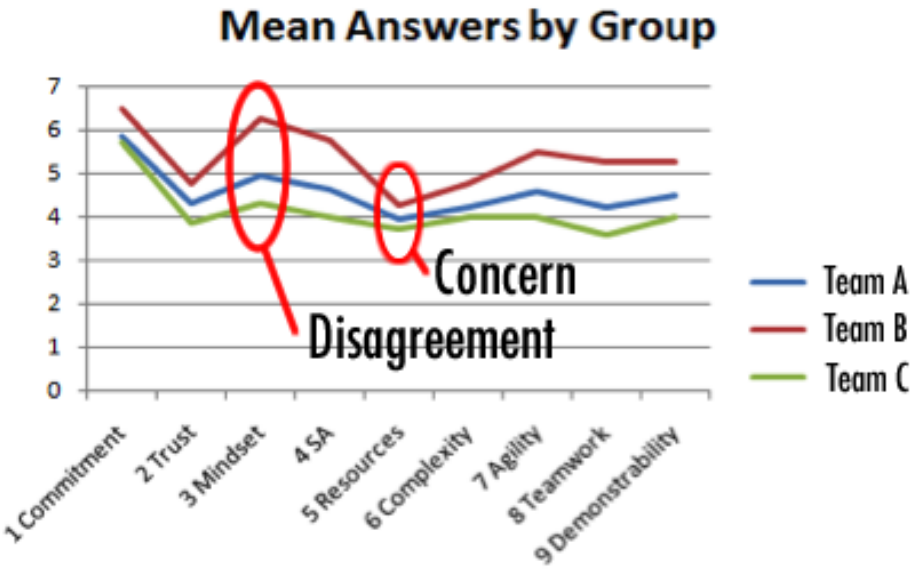
Diagnosis Phase

- Questionnaire
  - 9 Focus Areas
  - 9 or 54 Questions
  - Intended to spark thinking among stakeholders

Question	Strongly Disagree			Neither			Strongly Agree
1. Stakeholders are committed to this project's success.	1	2	3	4	5	6	7
2. There is an appropriate level of trust between the stakeholders on this project.	1	2	3	4	5	6	7
3. The people working on this project put the project's overall value to the users first.	1	2	3	4	5	6	7
4. Stakeholders are aware of what is going on with the project.	1	2	3	4	5	6	7
5. This project has the appropriate resources to reach a successful conclusion.	1	2	3	4	5	6	7
6. This project has an effective mechanism for managing requirements from multiple stakeholders.	1	2	3	4	5	6	7
7. This project is adapting appropriately to changes in the environment.	1	2	3	4	5	6	7
8. Project solutions balance the views of the stakeholders.	1	2	3	4	5	6	7
9. The value of this program is understood by people outside of the project team.	1	2	3	4	5	6	7

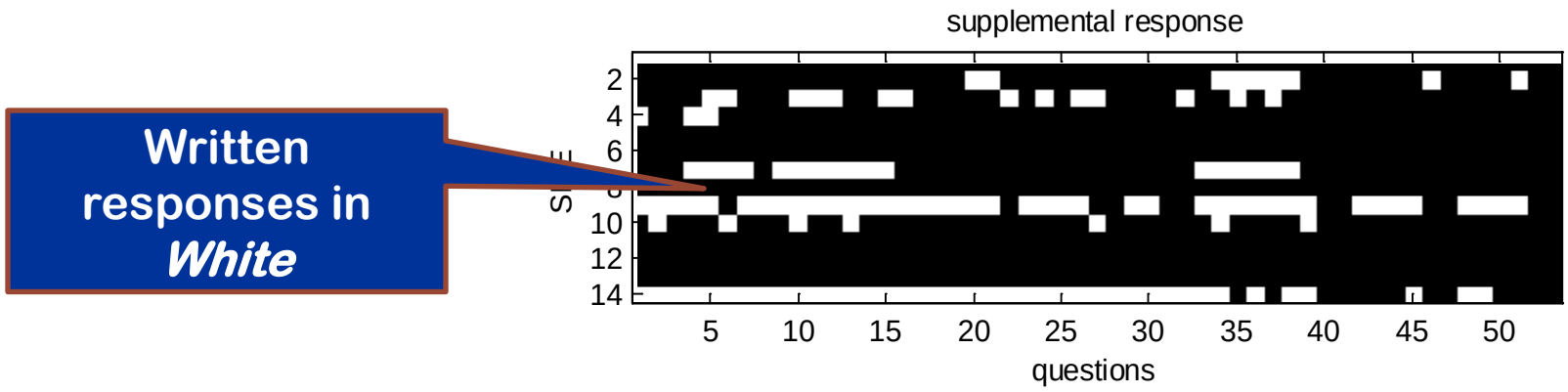
Analysis Phase

- Looking primarily for *Concern* and *Disagreement* among groups in the nine focus areas
- Identifying natural groups of respondents that answer similarly
- Identify outliers ("Grumps" and "Pollyannas")
- Examine the relationship between the natural groups and organizational groupings



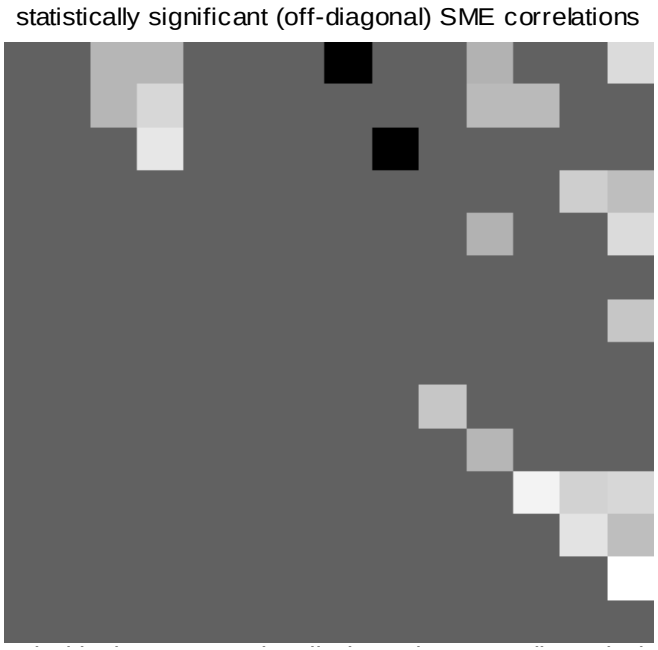
Analysis Phase

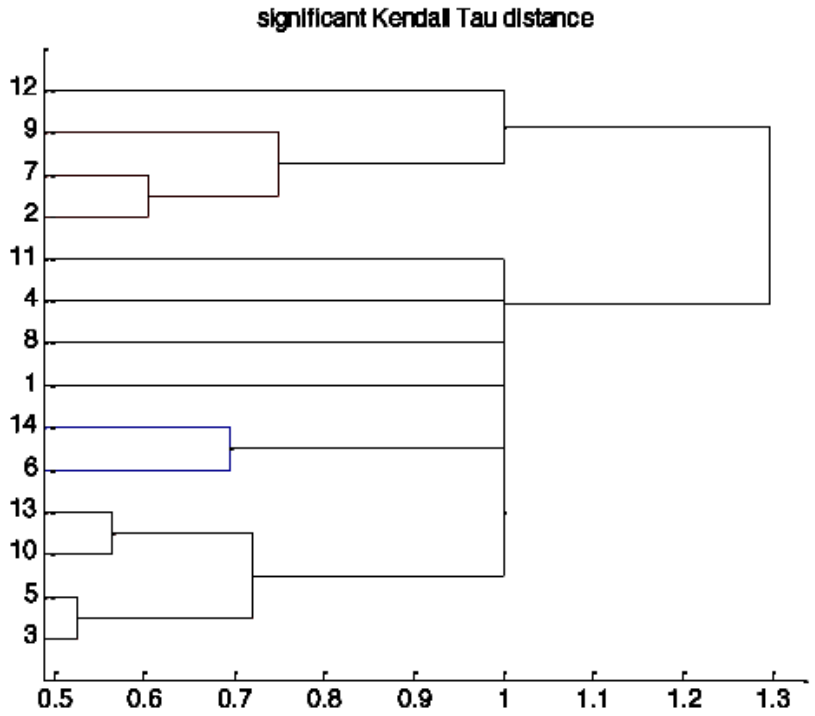
- Non-parametric analysis of survey responses
  - Distributions are not normal (non-Gaussian)
- Each survey question allows for written responses
  - Qualitative analysis



Hierarchically cluster SMEs based on significant correlation

- "bottom-up" linkage based on correlation
- Permute correlation matrix to reflect clustering





Pattern Matching

- POET Framework is based on the Design Patterns methodology
  - Pattern description is based on the template provided by *Design Patterns* (Gamma, Helm, Johnson, and Vlissides, 1995)
- Two classes of POET patterns defined
  - Diagnostic Patterns - Patterns that, based on the diagnostic evaluation, describe potential problems and gaps in the program
    - Example: Gap of Understanding
  - Intervention Patterns - Patterns that are potential solutions for associated diagnostic patterns
    - Example: Leveraging Leadership

Action Planning

Detailed plans for identified POET issues

- Template
  - Tasks
  - Justifications
  - Assignments/Responsibilities
  - Deadlines
  - Resources
  - Dependencies
  - Potential Issues

Conclusion

- By continually sharing information and ideas, and assessing stakeholder opinions of POET aspects of the program, we believe we can
  - Exchange information and ideas to promote shared understanding
  - Promote continual broad stakeholder involvement (especially end user)
  - Rapidly reach "good enough" solutions, not unanimity
  - Improve stakeholder buy-in
  - Surface perceived problems early
  - Leverage distributed and asynchronous collaborative participation

QUESTIONS