An Approach to Software Product Line Acquisition Planning

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What is the Problem?

Acquisition Planning	RFP / SOW	Source Selection

All too often acquisition planning is short-changed.

- The downstream consequences are often painful.

In a software product line (SPL) the acquisition considerations are different than "usual".

- an SPL acquisition can
  - be more complex
  - involve more stakeholders

If more attention is given to planning, acquisition risk can be reduced.

We have found that a good way to start this planning is by holding an *Acquisition Planning Workshop*.

Agenda

▶ ***Workshop overview***

Some details and examples

Conclusion

Acquisition Planning Workshop - Purpose

Why hold a workshop?

1. To be *proactive* in acquisition planning and RFP preparation when it can make a difference.

2. To provide a *structured technical interchange* for key acquisition stakeholders to understand the program's acquisition approach and current status, and explore potential ways for *reducing software acquisition risk*.
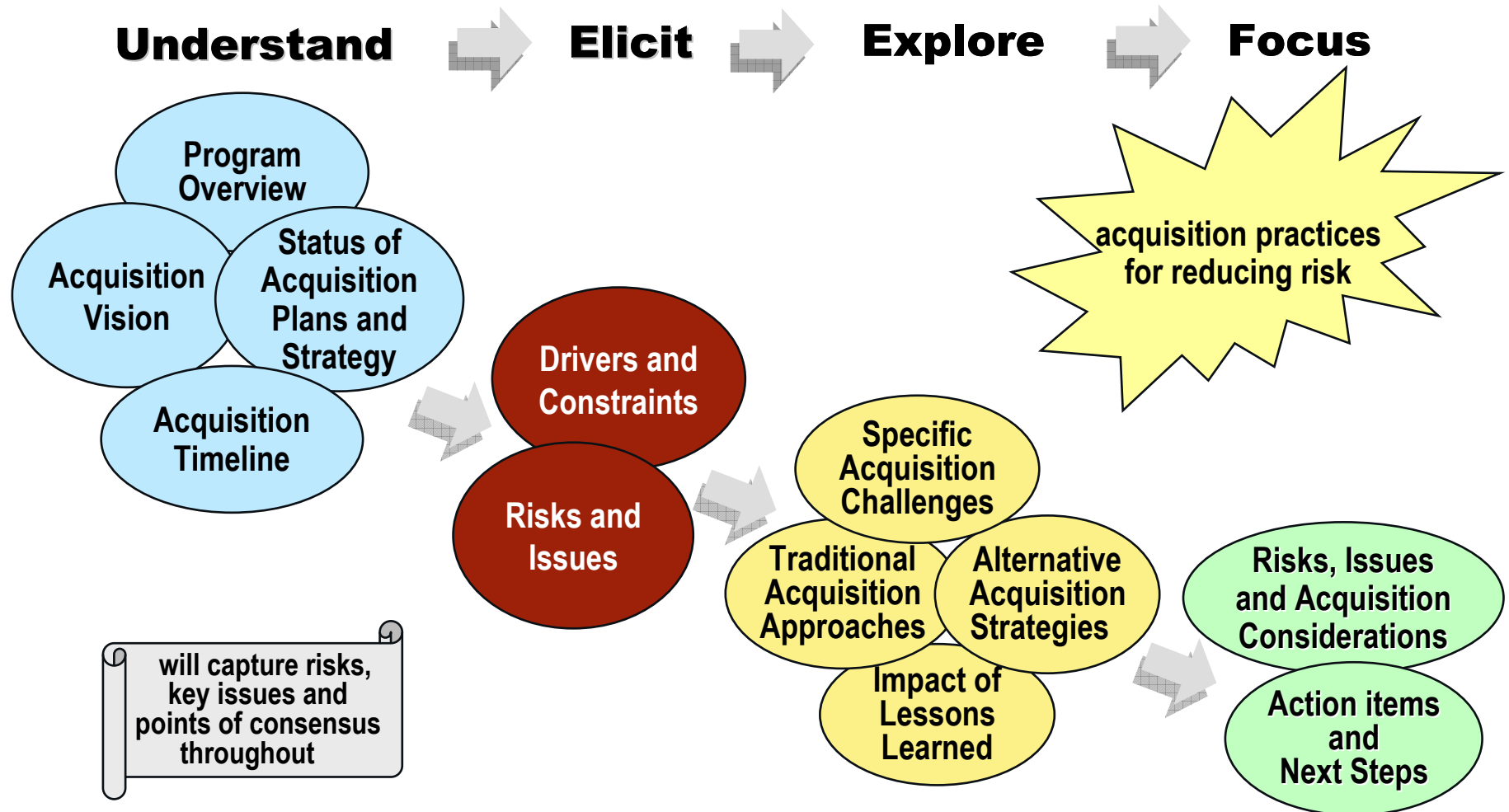
The workshop is most effective when tailored to the organization.

The workshop typically lasts 1 or 1 ½ days.

 We'll present a general approach with tailored examples interlaced.

Overview of Acquisition Planning Workshop

Understand → **Elicit** → **Explore** → **Focus**

- Program Overview
- Acquisition Vision
- Status of Acquisition Plans and Strategy
- Acquisition Timeline

- Drivers and Constraints
- Risks and Issues

- Specific Acquisition Challenges
- Traditional Acquisition Approaches
- Alternative Acquisition Strategies
- Impact of Lessons Learned

acquisition practices for reducing risk

- Risks, Issues and Acquisition Considerations
- Action items and Next Steps

will capture risks, key issues and points of consensus throughout

Sample Workshop Agenda - 1

Time	Topic	Responsibility
0800-0830	1. Welcome & Introductions	SEI/PO
0830-0900	2. System overview and product line vision	PO
0900-0915	3. Overview of acquisition organization and stakeholders	PO
0915-0930	4. Acquisition lifecycle – program status	PO
0930-1000	5. Elicitation of acquisition drivers, constraints and issues	SEI Facilitation
1000-1015	Break	
1015-1045	6. Basic product line acquisition approaches	SEI
1045-1100	7. Overview of system acquisition challenges	SEI
1100-1200	8. Elaboration* of Challenge #1	SEI Facilitation
1200-1300	Lunch	PO
1300-1400	9. Elaboration* of Challenge #2	SEI Facilitation
1400-1500	10. Elaboration* of Challenge #3	SEI facilitation
1500-1515	Break	
1515-1615	11. Elaboration* of Challenge #4	SEI Facilitation
1615-1700	12. Review and Next Steps	SEI Facilitation

* Includes capture of risks, key issues, action items, and points of consensus

Sample Workshop Agenda –2

If necessary the workshop could extend into a second day to
- address additional challenges
- review previous discussions in light of lessons learned
- explore alternative acquisition strategies
- plan the next steps more thoroughly
- begin to address action items

Agenda

Workshop overview

▶ ***Some details and examples***

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Agenda Item 2 – System Overview and Product Line Vision

The PM/Acquisition Organization provides

- A summary statement of the mission need with some elaboration of the important aspects

- A system *context diagram* (black box view) showing

  - system concept

  - all the actors that interface with the system

  - primary and secondary actors

  - key system input and output artifacts

- a system block diagram (white box view)

- the product line vision

  - high-level scope, ownership, future

Agenda Item 3 – Overview of Acquisition Organization and Stakeholders

The PM/Acquisition Organization summarizes

- The program management and acquisition organization showing:
    - organizational chart for acquisition organization
    - all the organizations that are (or will be) involved and key stakeholders
    - prime and supporting contractors
    - the organizations represented at the workshop

- Other key stakeholders and relationships (e.g., other services)

- Who's doing what -- overview of roles & responsibilities (e.g., IPT's)

- Working relationships envisioned for product deployment and life cycle support

Agenda Item 4 – Acquisition Lifecycle – Program Status

The PM/Acquisition Organization summarizes

- Status of the program in relation to the regulatory life cycle milestones that have completed

  – acquisition management documents that have been completed

  – approvals that have been obtained

- Major activities that are currently in progress

- Where the program is in the RFP planning and preparation cycle

- Any acquisition planning risk areas that need to be addressed

Agenda Item 5 – Elicitation of acquisition drivers, constraints and issues

Sources of drivers and constraints

Externally Imposed	Adopted by Acquisition Organization	From Other Stakeholders

Types of drivers and constraints

- business
- management
- programmatic

- mission
- technical
- system qualities
- software considerations

- political
- cultural

- contractual
- legal

Example Drivers and Constraints - 1

Example *Externally-imposed* Drivers and Constraints
- Joint service program
- Imposed schedule compression
- Cost plus contract
- Standard desktop configuration
- SOSCOE compatibility
- Stringent interoperability requirements

Example Drivers and Constraints *Adopted* by the Acquisition Organization
- RFI to industry <day.month.year>
- RFP release <day.month.year>
- Competitive down select and contractor teaming encouraged
- Incentive award fee
- Use of CORBA middleware

Example Drivers and Constraints - 2

Example Drivers and Constraints *Imposed by Other Stakeholders*

- Flight certification
- Multi-level security
- Backward software compatibility with legacy systems

Agenda Item 6 – Basic Product Line Acquisition Approaches

Referring to presentation by John Bergey, the three approaches are

- Commission a government organization to develop the product line.
- Commission a supplier to develop the product line.
- Commission a supplier to develop products using its own product line.

It is useful to consider this as pre-work prior to the workshop.

If it hasn't been considered yet, this will be a fundamental decision.

Agenda Item 7 – Overview of Acquisition Challenges

Pre-work is definitely called for to adequately prepare for this step.

- The SEI works with the PM to develop a set of key challenges.

These challenges serve as a focal point for identifying risks, issues, decisions and actions.

Example: An existing product line effort will serve as the basis for a new competitive acquisition for a follow-on family of systems.

A set of key challenges for this situation could be

- How to support on-going product development and sustainment
- How to take possession of and transition existing assets for future use
- How to initiative the new competitive acquisition
- How to manage the overall program office commitments

Agenda Items 8-11 – Discussion of Acquisition Challenges

Again, pre-work is very useful to create a set of questions to guide the discussion and stimulate thought for each acquisition challenge.

Example discussion questions for the challenge "*How to support on-going product development and sustainment*"

- What is the scheduled life-time for currently deployed systems? What support will be necessary during this period? Is a phase-out planned?
- Are there dependencies between this sustainment and the new acquisition?
- How long is the current contract in effect? Is an extension necessary to provide continuity of support? Should the scope of work be reduced (e.g., just focus on critical fixes)?

Example discussion questions for "How to take possession of and transition existing assets for future use"

- Have we validated the government data rights?
- Do we have an inventory of transitionable assets? Is additional effort necessary to package the assets?
- Do we have the necessary training materials?

Discussion of Acquisition Challenges

If a set of specific tailored questions has not been identified prior to the workshop, consider these basic questions

- What needs to be done?
- When will it have to be done?
- Who will be responsible for doing it?
- Where are the unknowns?
- What will be difficult about different approaches?
- What is realistic in terms of effort and time?
- What constrains our work?
- How do we make sure the work is done satisfactorily?
- How can we avoid past problems?

As the discussion proceeds, a scribe records risks, issues, decisions and actions.

Example Risks and Issues

- There is no common understanding of the scope of the effort.
- The way the approach is currently planned, the government will be thrust into the role of system integrator.
- The schedule is unrealistic in <these areas>.
- We need to determine if we will run a competitive down-select.
- The envisioned acquisition approach is likely to result in a family of "clone-and-own" products rather than a product line
- The Request for Information needs to be more fully developed.
- The program office does not have sufficient staff to accomplish the tasks we have identified.
- There is a gap between what the current contractor is obliged to deliver and what is needed for subsequent life cycle support.
- Non-functional (i.e., quality) requirements are inadequately understood.

Agenda Item 11 – Review and Next Steps

Review

- risks and issues and decisions
    - create additional actions to priority items
- review action items
    - clarify and assign responsibilities

Plan next steps

Agenda

Workshop overview

Some details and examples

▶ *Conclusion*

SEI Experience with the Approach

We have gotten positive feedback on the workshops we have conducted so far.

- Improved identification of stakeholders
- Improved communication among acquisition stakeholders
- Improved understanding of acquisition risks
- Better basis for a successful acquisition

Questions

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