On Lock Down: Requirements Change Management

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How can we help you shine?

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Ground Rules

- This session is for you, so please participate.

- Interrupt me for clarifications.

- The content in this presentation is the responsibility of Hans Eckman, and does not express the views or opinions of SunTrust Bank.

- No animals were harmed during the creation of this presentation. Please support your local pet rescue groups.

Conclusions

- Principles of release management and change control can be applied to requirements management.

- Level of control must match risk and timing.

- Consistency and diligence are required for success.

Diligence

Triage

Threat Level
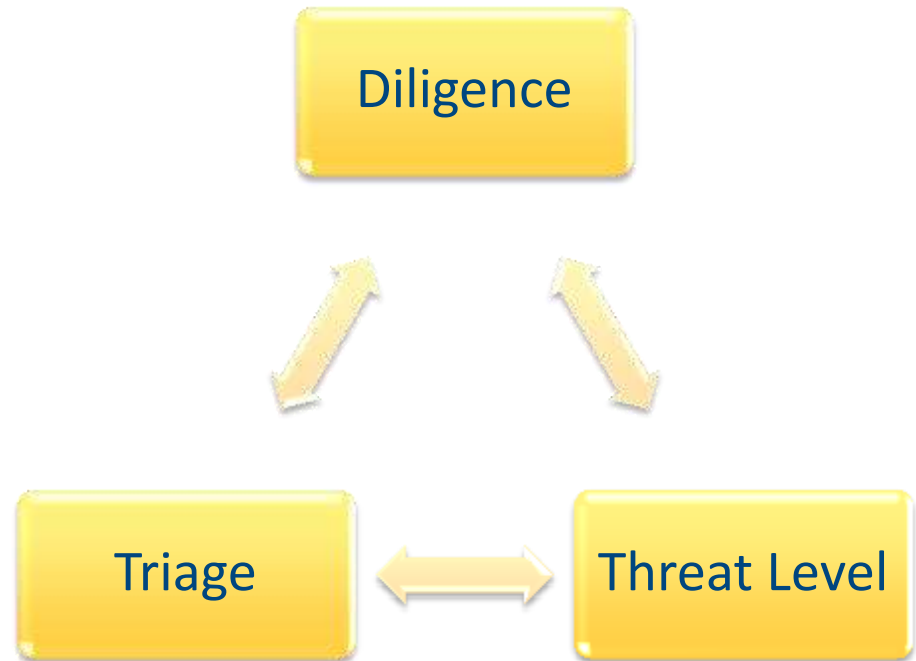
The Ideal Project Timeline

Define → Develop → Test → Implement

- All stakeholders agree, and know exactly what they need from the beginning.

- Developers translate the requirements perfectly into a viable solution.

- No defects or missed requirements in solution.

- No change in business need or prioritization during the project.
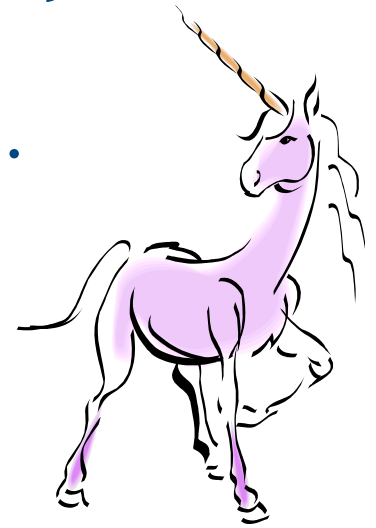
The High Cost of Change

Error Cost Factor	Requirements, Design	Coding, Unit Test	Integration Test	Acceptance Test	Post-product Release
Tassey[1]	1x	5x	10x	15x	30x
Boehm[2,3]	1x	3x	7x	50x	100x
When Errors are introduced[1]	3.5%	10.5%	35%	6%	15%

Other Cost Factors[3]

- "One insight shows the cost-escalation factor for small, noncritical software systems to be more like 5:1 than 100:1."

- "Current software projects spend about 40 to 50 percent of their effort on avoidable rework."

- "Two major sources of avoidable rework involve hastily specified requirements and nominal-case design and development…"

The Only Constant is Change

Define ▶ Develop ▶ Test ▶ Deploy

Ambiguities, Clarifications, Invalid Requirements

Scope and Prioritization Changes

Constraints: Design, Resource, Time, Budget

Missed Requirements

Missed implementation

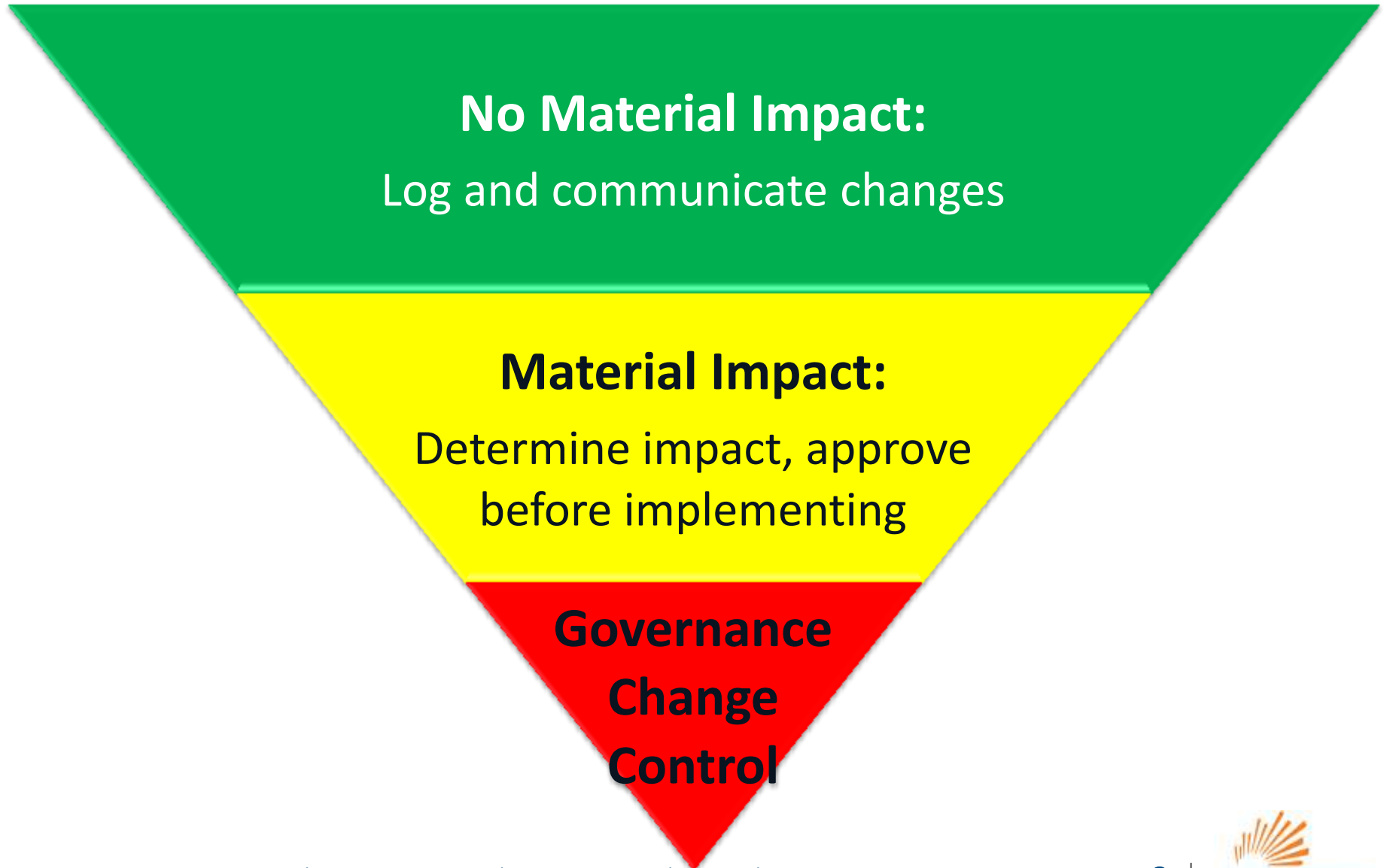Change in business need

Threat Levels

No Material Impact:

Typos, Wording Ambiguities, Clarifications, Structure, Formatting, Decomposition, Supporting Requirements, Details, Etc.
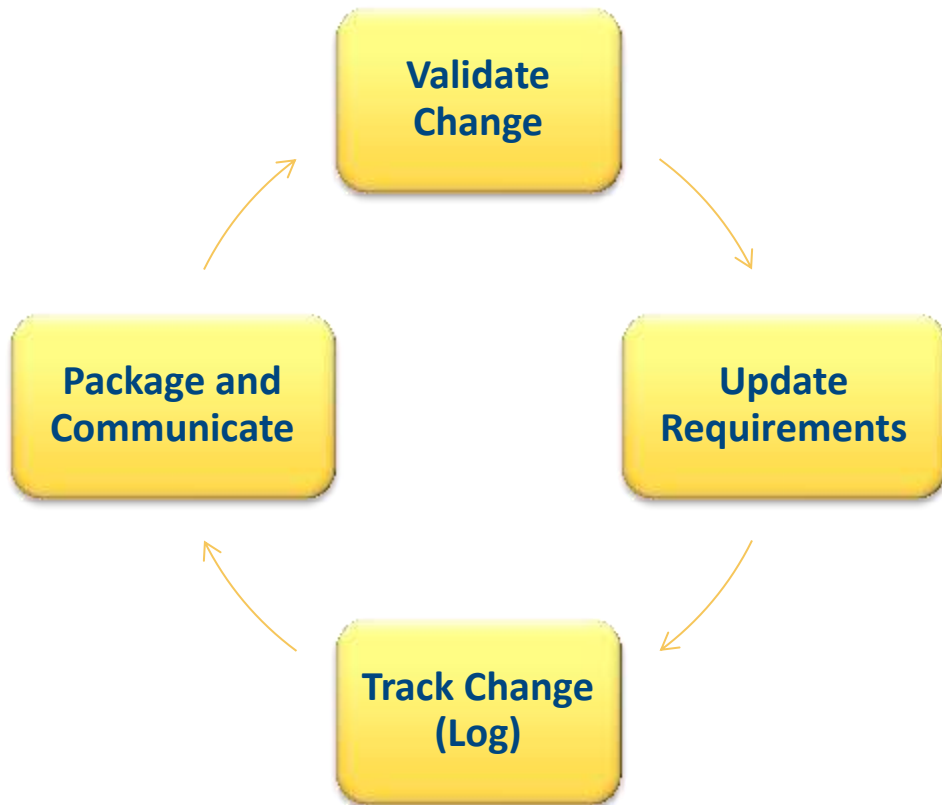
Material Impact:

Missed Requirements, New Requirements, Constraints, External Impacts, Etc.

Governance Impact

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# Triage Levels

No Material Impact:
Log and communicate changes

Material Impact:
Determine impact, approve before implementing

Governance Change Control

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No Material Impact - Update Process

Validate Change

Update Requirements

Track Change (Log)

Package and Communicate

- Begin after first formal communication of requirements

- Need to update system of record for requirements

- Log all changes with effective date

- Update Process is the foundation for Change Approvals

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Documenting Changes

- Changes are logged by document version

- State changes source: defect, change control, etc.

- Indentify owner, effective date and requirement ID

- Show before and after

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Changes Requiring Approval

Update Process

Define Impact, Revise

Change Control Needed?
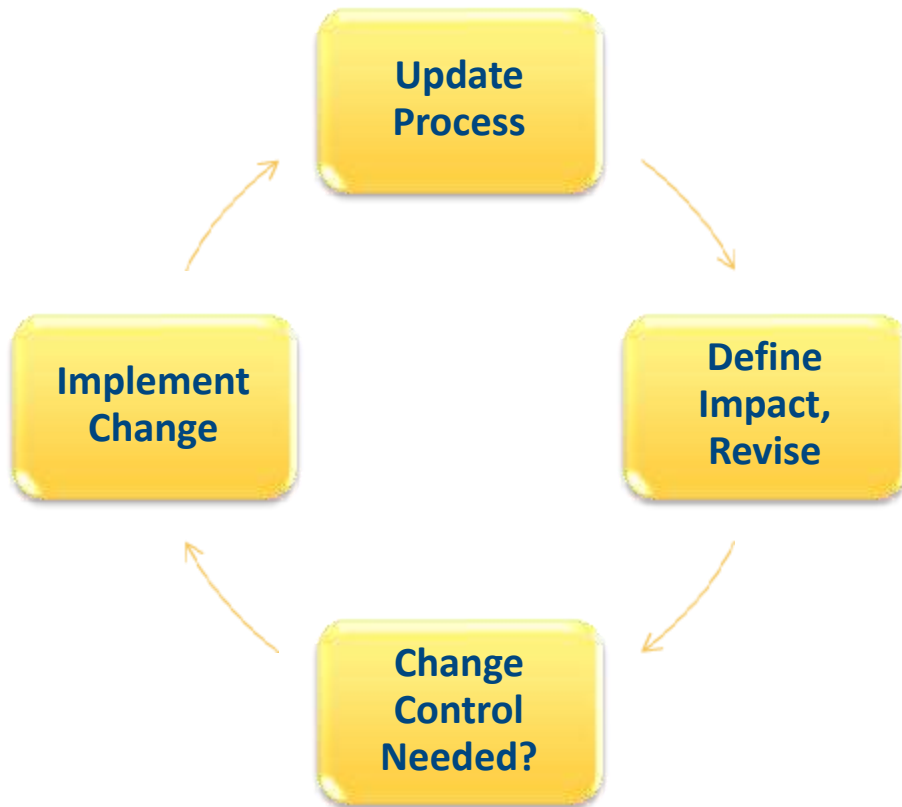
Implement Change

- Occurs when:
  - After document approval
  - Change to functionality
  - Impacts other deliverables
  - Impacts cost or schedule
- Leverages Update Process
- Define impact and cost if change is implemented
- Complete Governance Change Control if needed
- Stakeholders must approve

Tracking Approvals

Governance Change Controls

Additional step in Approval Process

Follow standard change control form and process

Use for

- Changes after artifact signoff

- Significant project impacts (scope, functionality, cost, schedule, etc.)

- Regrouping scope into releases or implementations

- Approval of all changes for final document version

Best Practices

- Communicate change process and templates as part of your requirements approach. No Surprises!
- Maintain consistent control and communication.
- Impact assessment is key to risk management.
- Leverage tools when available
  – Requirements management system
  – Defect/Change log
  – Track changes (Microsoft Word)
- Cross-reference every change
  – Source
  – Reason
  – Date
  – Supporting documentation: defect, change request, impact analysis, change control, etc.

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Applying to Baseline Documentation

Baseline

+

Release Changes
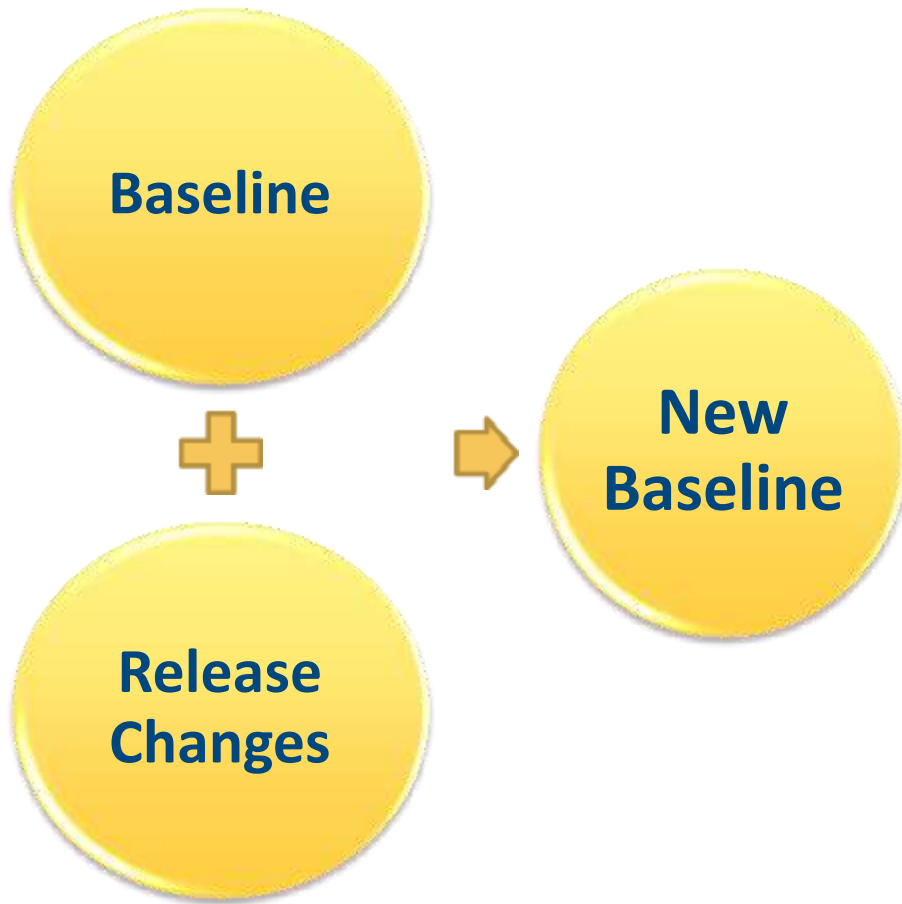
→ **New Baseline**

- Starting from baseline documentation dramatically reduces cost and risk
- Treat all scope as changes to baseline requirements
- Sum of changes is the release scope
- Sum of changes and original baseline becomes the new baseline
- May take additional time and effort to maintain accurate baseline

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Conclusions

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- Consistency and diligence are required for success.

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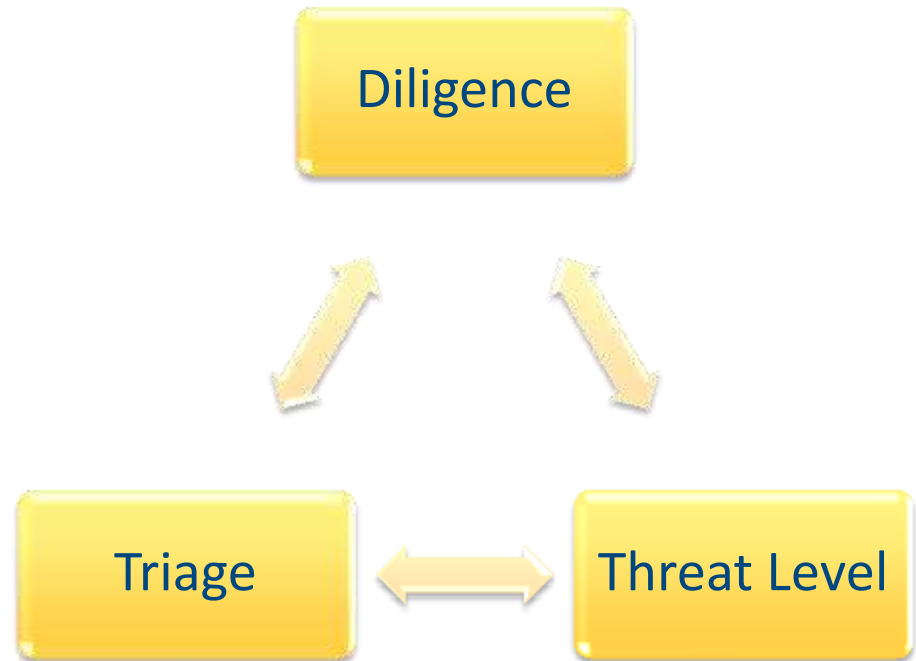
Appendix: Cost of Changes and Defects

1. *The Economic Impacts of Inadequate Infrastructure for Software Testing*
   - http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.122.3316&rep=rep1&type=pdf
   - Gregory Tassey, Ph.D., National Institute of Standards and Technology
   - Prepared by RTI: Health, Social, and Economics Research, RTI Project Number 7007.011

2. *Requirements-Based Testing: Encourage Collaboration Through Traceability*
   - http://www.softwaremag.com/linkservid/0E91E962-AEE3-2E9A-B2B475D66F29CC30/showMeta/0/
   - MKS, 2009

3. *Software Defect Reduction Top 10 List*
   - http://www.cs.umd.edu/projects/SoftEng/ESEG/papers/82.78.pdf
   - Barry Boehm and Victor R. Basili, January 2001

4. *An Introduction to Agile Software Development*
   - http://www.danube.com/docs/Intro_to_Agile.pdf
   - Victor Szalvay, Danube Technologies, Inc., November 2004

5. *Cost of Change - Modernized*
   - http://www.aptprocess.com/whitepapers/CostOfChangeModernised.pdf
   - Paul Oldfield, Mentors, 2003, Appropriate Process Group

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