Inspections and Reviews for Improved Quality

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Inspections vs. Reviews

Inspections

- Formal
- Group Effort
- Meeting Setting
- Record Defects
- Time-boxed

Reviews

- Informal
- Individual Activity
- Feedback sent to moderator may be recorded as defects.
- May take days to get feedback.

Importance of Inspections and Reviews

- Identify defects earlier.
- More cost-effective than fixing later.
- Product Quality Improvement.
- Reduce cost of downstream activities.
- Allow for quantitative quality assessment.
- Develop the organization to produce better products -> Process Improvement
- Promotes cross-training.

Risk Mitigation

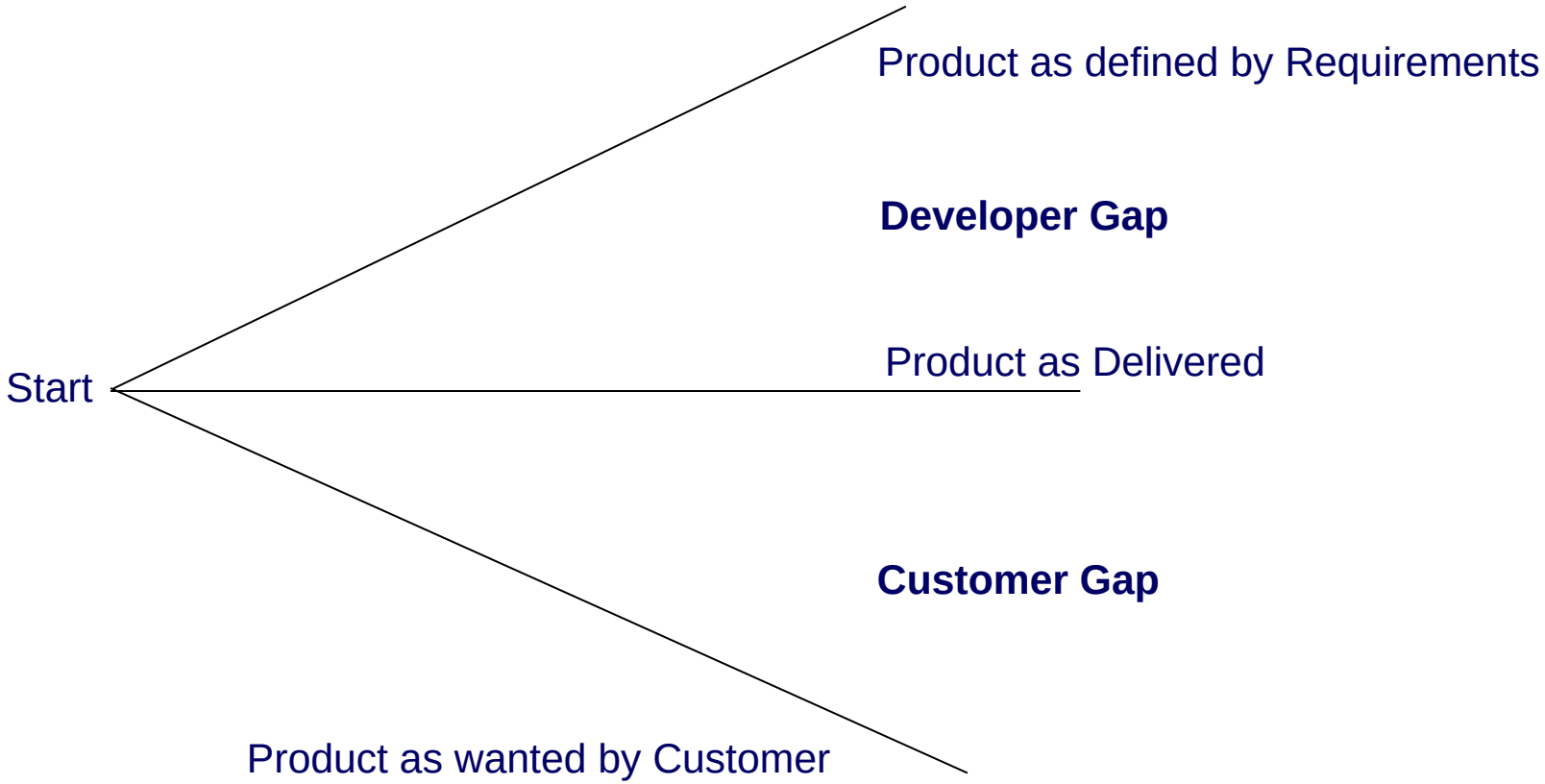
- Goal is to reduce risks the product would fail to possess quality attributes:
  - Meet business requirements
  - Conform to Standards
  - Be maintainable or contain reusable components
  - Efficiently process data
  - Testable
  - Usable
  - Flexible
  - Integrate with other required systems

Cost of Quality Impact

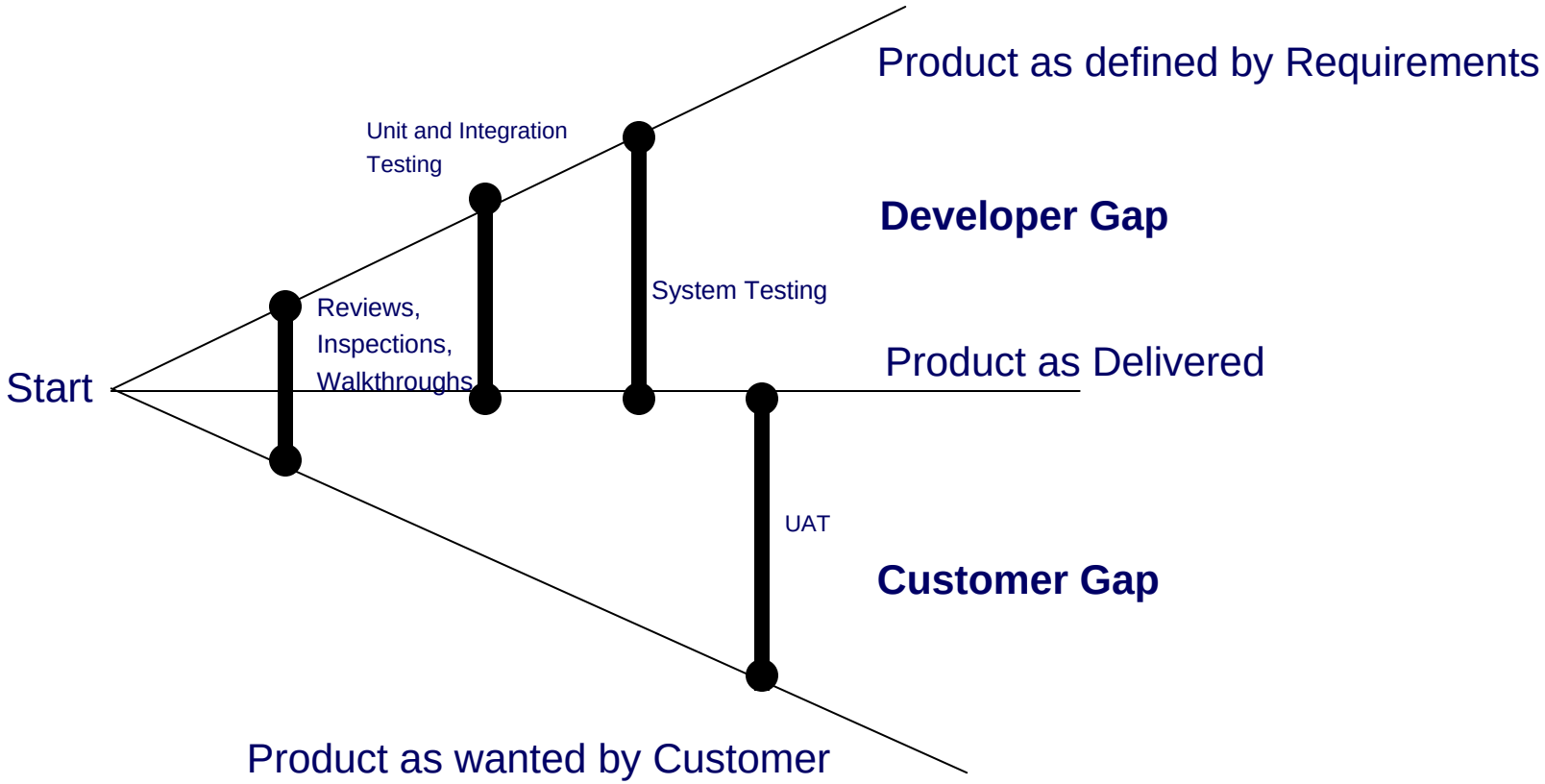
- The net impact is to reduce the Cost of Quality – the money spent beyond what it would take to build a product correctly the first time.
  - Prevention – methods, procedures, training
  - Appraisal – inspections, reviews and testing
  - Failure – rework, bug fixes, lost business

Increase Prevention and Appraisal should have a greater reduction in the Failure cost.

Developer and Customer Gaps



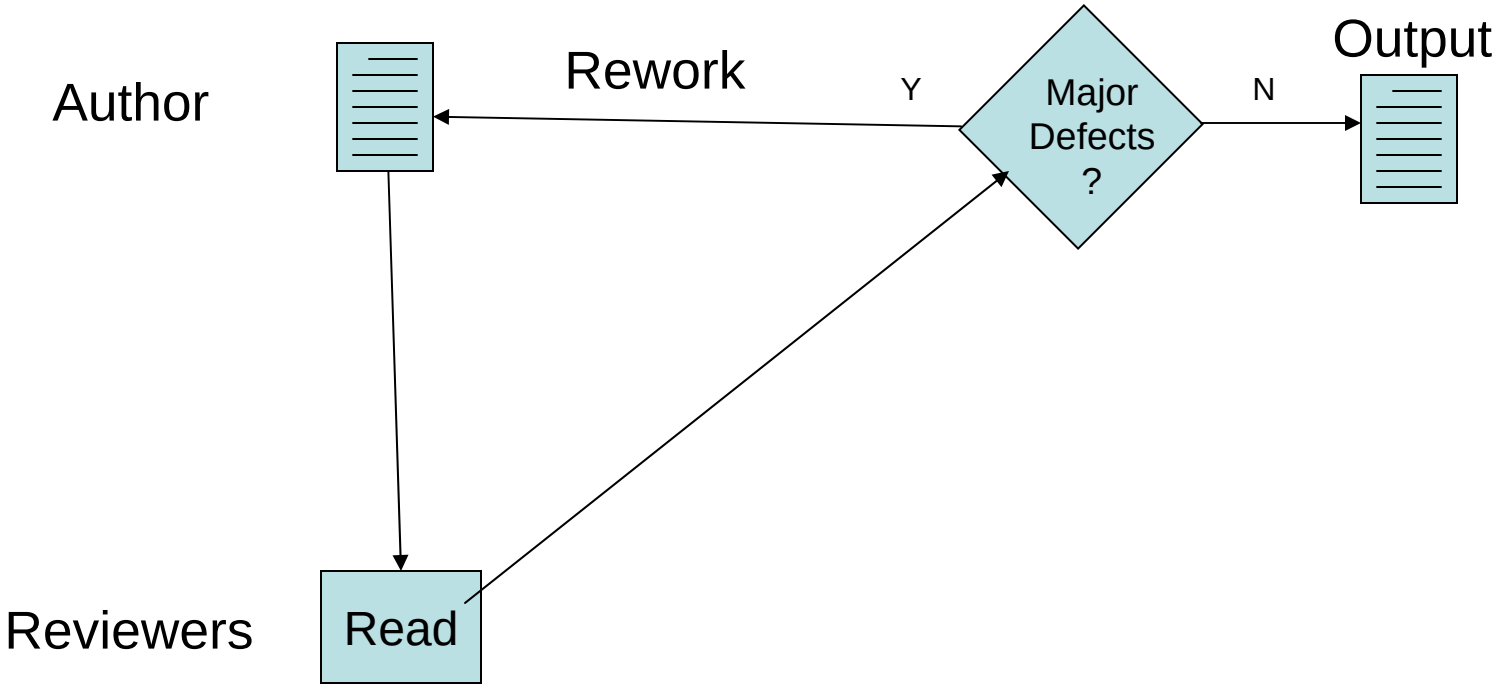
Developer and Customer Gaps



Review Basics

- No rigid format meetings
- Assign review of artifact to individuals, each to review on a different aspect:
  - Standards
  - Efficiency
  - Maintainability
  - Logic Flow
  - Data Constructs/Database use
  - Production Environment Impact
  - Downstream Dependencies

Review Process

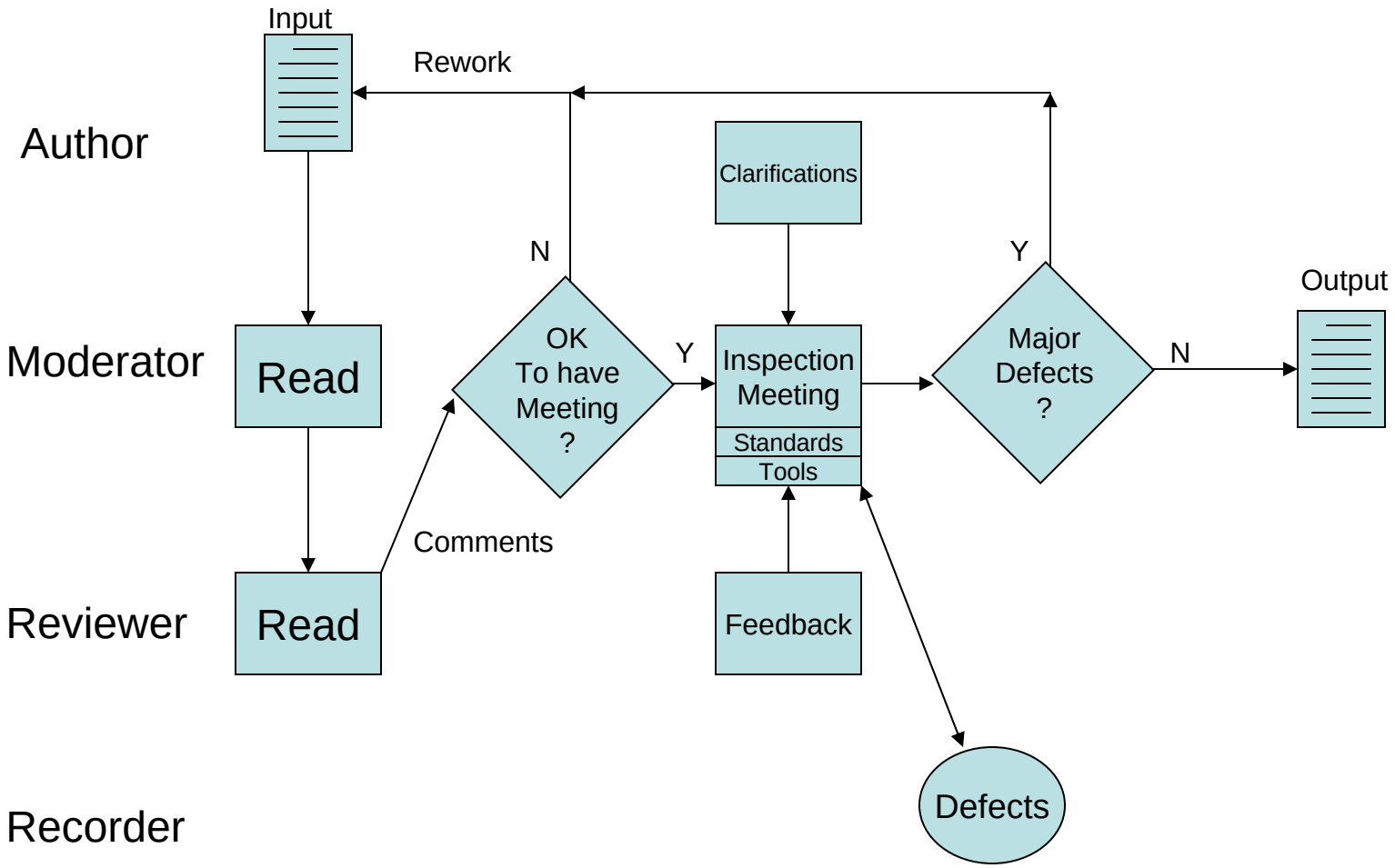


Look for clarity, compliance to standards, efficiency, maintainability, logic flow, data storage, impacts on other systems.

When to use Reviews

- Rapid response is not critical.
- Reviewers are already familiar with the artifact under review.
- Group discussion is not anticipated.
- Rework will not result in a strategic change.

Inspection Process



Inspection: Customer Need

- **Artifact**: Problem or need description.
- **Risk**: The need for a system change is not clearly stated.
- **Activity**: Discuss with sponsor and customer representatives the problem, rank priority relative to other problems or needs.
- **Cost**: Low
- **Benefit**: High

Inspection: Return On Investment

- **Artifact**: ROI Calculations.
- **Risk**: Time and money could be directed to non-cost-effective projects.
- **Activity**: Validate assumptions and expectations of resource utilization used in calculations. Include in post-project analysis to understand any deviations from expectations.
- **Cost**: Low
- **Benefit**: High

Risk Reduction may not have tangible savings.

Inspection: Requirements

- **Artifact**: Requirements Document
- **Risk**: The requirements might not meet the business need.
- **Activity**: Detailed examination of requirements to determine their completeness, correctness and consistency relative to the Customer Need.
- **Cost**: Medium
- **Benefit**: High

Itemized requirements allow for traceability later.

Inspection: Design

- **Artifact**: Technical Design Document
- **Risk**: The design might not be consistent with the requirements or violate standards.
- **Activity**: Detailed examination of the design to determine its completeness, correctness, efficiency, testability, maintainability, usability and consistency relative to the requirements and standards.
- **Cost**: High
- **Benefit**: High

Have a Technical Review team and rotate members every 6 months.

Inspection: Code and Technical

- **Artifacts**: Software, Database changes
- **Risk**: The software or database changes might not be consistent with the design or violate standards.
- **Activity**: Detailed examination of the code and database changes to determine its completeness, correctness, efficiency, maintainability relative to the requirements, design and coding standards.
- **Cost**: High
- **Benefit**: Medium

Can be very time intensive if all code is reviewed in detail.

Inspection: Product Demo

- **Artifacts**: Early build and environment.
- **Risk**: The deliverable might not be consistent with customer's expectations.
- **Activity**: Demonstrate usability and correctness relative to requirements.
- **Cost**: Low
- **Benefit**: High

If a GUI app, do screen mock-ups before writing code.

Inspection: Test Plan

- **Artifact**: Test Plan.
- **Risk**: The testing may be insufficient.
- **Activity**: Review the stages of testing that will be performed: Inspections or reviews, Unit, Integration, System, Regression, User Acceptance.
- **Cost**: Low
- **Benefit**: Medium

Use a simple template to remind people of the kinds of testing that should be considered.

Inspection: Test Case

- **Artifacts**: Test Cases, Data, Environment.
- **Risk**: The testing may be insufficient.
- **Activity**: Review the test cases that will be executed: Unit, Integration, System, Regression, User Acceptance. Verify traceability to test plan, requirements, test data, environment needs.
- **Cost**: High
- **Benefit**: Medium

Use tools that report traceability gaps.

Inspection: Deployment Plan

- **Artifact**: Deployment Plan.
- **Risk**: The steps for releasing to production may be unclear or incorrect.
- **Activity**: Review the deployment plan step by step with those who will use it. Was it executed in a test environment? How and when do we know it is successful? Is there a rollback plan?
- **Cost**: Low
- **Benefit**: High

Use an auditable system for recording who performed each step in the deployment plan.

Inspection: Post-Implementation

- **Artifacts**: Defect Log, Customer Comments.
- **Risk**: We repeat mistakes.
- **Activity**: Review the defect log, customer comments and support staff comments.
- **Cost**: Low
- **Benefit**: High

Goal: Improve Process, not Product.

Inspection: SOX

- **Artifacts**: Control Set, Evidence controls were effective.
- **Risk**: Financial Misstatements, Disclosure of control deficiencies.
- **Activity**: Review changes, approvals, access control permissions, record archives. Identify where records are incomplete or missing.
- **Cost**: Medium
- **Benefit**: Low

Do not rely on people to have to “remember” to follow the controls. Make as many as possible automatic and part of the process so a deviation can not occur. Examples – Approval Workflows and alert mails.

Inspection: ISO 9001:2000

- **Artifacts**: Document & Record Storage, Corrective & Preventive Actions, Quality Metrics, Training Logs, Job Descriptions, Process Changes, Customer Feedback, Vendor Management, Management Reviews.
- **Risk**: Break the Plan-Do-Check-Act cycle.
- **Activity**: Are we maintaining the artifacts? Are we repeating good practices and avoiding repeating mistakes?
- **Cost**: High
- **Benefit**: Medium

Inspection Measures

- Raw numbers related to inspections:
  - Person-hours spent in inspections.
  - Counts of revisions.
  - Counts of defects grouped by:
    - Inspection Type
    - Author
    - Severity
    - Process (group) or Product (individual)
    - Category
    - Resolution
    - Root Cause

Use the same defect tracking tool for all inspections as you use for recording test defects.

Inspection Metrics

- Calculated Metrics Indicate if we are getting value for the effort:
  - Time per page, diagram or KLOC.
  - Defect density.
  - Analysis grouped by type, category, resolution, root cause, author.
  - Compare analysis with original project risks.
  - Compare with defects found by customers.

Can you show a trend in defects over time?

Good Inspection Practices

- Obtain Executive Sponsorship.
- Clarify the process – training, roles, steps, standards, defect logging, follow-up.
- Include in project plans, include rework too.
- Be prepared for meetings.
- Include the right people.
- Do not let the author drive the meeting.
- Focus on artifact, not author.
- Limit problem solving discussions.
- Make benefits visible to management.

Exercise

- Divide into groups of 4 to 5.
- Take a few each minutes to identify your risks.
- Identify inspection types that would benefit your company. Consider the Cost & Benefits.
- Discuss risks with others in your group.
- Group discussion of what people find most beneficial.