The Business Case for Requirements Engineering

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In a Nut Shell

- Requirements first opportunity to screw up
- Many requirements engineers aren’t
- Requirements typically contain many defects
- Requirements impact all down-stream work
- Cost to fix defects increases rapidly the earlier they are introduced
- Requirements primary reason for failure
First Opportunity to Fail

There are many chances to fail on any project:
- Contracting
- Requirements Engineering
- Architecting
- Design
- Implementation
- Integration
- Testing
- Etc.

Requirements first engineering chance to fail.
Many Requirements Engineers Aren’t

Requirement Myth:
• Since most requirements are specified in narrative English and most employees are minimally literate, managers often think that anyone (including low-level new hires) can do requirements engineering.

Requirements engineers lack training in:
• Requirements Tasks:
  • Requirements Identification
  • Requirements Analysis
  • Requirements Specification
  • Requirements Management
• Requirements Techniques (e.g., use case modeling)
• Requirements Tools
Requirements Contain Defects

The percentage of defects originating during requirements engineering are estimated as:

• 50% (Karl Wiegers, 2001)
• 42% (A Wingrove)
• 60-64% (requirements and design – EBG Consulting)

Requirements typically lack:

• Cohesiveness, Completeness, Correctness, Consistency, Currency, Essential, Feasibility, Lack of Ambiguity, Relevance, Testability, Usability, Validatability
Requirements Engineering Impacts

Requirements Engineering impacts:

- Management (scope management)
- Architecture (architecturally-significant requirements)
- Design and Implementation
- Testing
- Quality Engineering (determines defects)
- Safety Engineering (safety requirements)
- Security Engineering (security requirements)
- Reuse
- Training

Requirements Defects Snowball
Defect Costs Are Excessive

Requirements engineering defects cost:
- 50-200 times as much to correct once fielded. (Barry Boehm, 1988)
- 10-100 times as much to correct once fielded (Steve McConnell, 2001)
- 15 times as much to correct once fielded (IBM System Sciences Institute – all defects so requirements worse)
- 10 times as much to correct during testing (Hughes Aircraft)

Reworking requirements defects on most software development projects cost:
- 40-50% of the effort (Capers Jones)
- 80% of the effort (Karl Wiegers, 2001)
Bad Requirements Cause Failures

Requirements problems are the single number one cause of project failure:

- Significantly over budget
- Significantly past schedule
- Significantly reduced scope
- Poor quality applications
- Not significantly used once delivered
- Cancelled
Conclusion

Requirements Engineering:
• Starts project on the right foot
• Turns requirements workers into trained requirements engineers
• Eliminates and minimizes defects
• Improves architecting, design, implementation, testing, QA, security, safety, etc.
• Decreases development and lifecycle costs
• Increases probability of success
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