The Economics of Performance Engineering Involvement in Architecture Proposals

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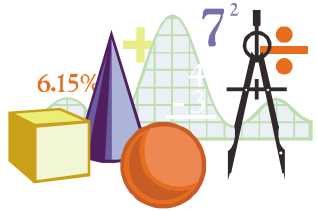
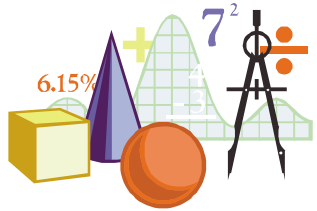


Architecture and Performance Engineering

- Software performance engineering has a high payoff when it begins on day one of an architecture effort.
- The following case studies are drawn from:
  - 5 years as SPE for 500-person development organization.
  - 5 years as internal SPE consultant for 25,000-person R&D corporation.
  - 2 years as independent SPE consultant.



Case Study: Meeting Contractual Obligations

- Retrofit of a contracted feature for a demanding customer several years after initial deployment.
- One week of SPE showed that the initially proposed distributed architecture was not viable because of bandwidth limitations. $10K saved 60 staff months ($750K) of rework.
- A centralized architecture with high performance risk was mandatory. If it did not meet response time requirements, the vendor would be responsible for over $1M in hardware upgrades.
- The additional cost of the SPE effort that led to success: $150K (6 months SPE, 4 months performance test, 1 day of developer rework). $150K saved $1M.

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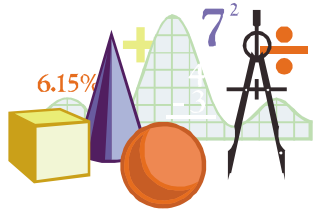

Case Study: Evaluation of an Outsourcing Proposal

- A customer asked a vendor to evaluate a proposal from a third-party service provider to port an application from 10 Unix servers to a single Amdahl mainframe.
- Performance modeling showed that the proposed front-end processor could not handle the required workload, and that the proposal was not economically viable. One mainframe would be needed to replace each Unix server. The projected effort to port the software was 6 months each for 10 people ($750K) plus use of new hardware for testing.
- The cost of the SPE effort: $4K saved $750K.

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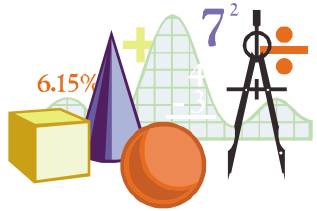
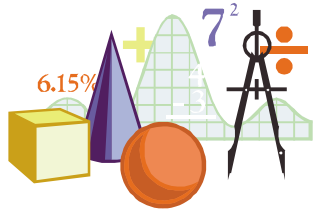


Case Study: Global Deployment Proposal

- Proposal to deploy a mature software system for a global project.
- Architect and manager were hostile to the finding of an architecture review that predicted failure.
- Upper management mandated performance modeling that identified a fundamental bottleneck, and confirmed the architecture review finding that a new architecture was required.
- The cost of the architecture review + SPE effort: $72K.
  - Ten staff weeks of effort for the architecture review (half from the review team, half from the project).
  - One month of a performance engineer's time.
  - A combined total of one staff-month effort from the project team to support the modeling effort.



Early SPE for Risk Mitigation

- Early SPE involvement in architecture proposals minimizes rework by minimizing the risk of attempting to deploy a non-viable architecture.
- Intervention takes place earlier than a typical architecture review. Ideally, a performance engineer participates in early architecture discussions.

How Many? How Fast?
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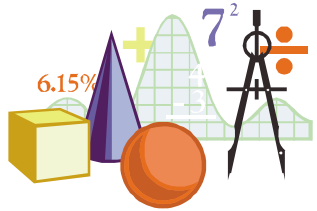

Cost of Early SPE Intervention

- Staff costs assumptions:
  - $150K loaded salary per year for typical technical employee
  - $200K loaded salary per year for SPE in organization
  - $2K per day for internal SPE consultant
  - $2.5K per day for external SPE consultant
- The additional costs of early SPE intervention:
  - One staff month for SPE training ($12K for 20 people taking a one day course) the first time SPE is used on project.
  - One month of a performance engineer's time ($15K to $40K).
  - A combined total of one staff month from all other project staff for the SPE effort ($13K).

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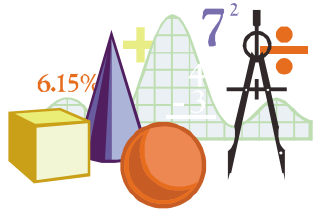

The Bottom Line

- $10K of SPE saved $750K of rework.
- $150K of SPE saved $1M in contract costs.
- $4K of SPE saved $750K of throwaway software porting costs.
- $72K of SPE verified that a system could not meet the needs of a new application.