

ROI of Dependability Activities

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(Contractors) Don't understand dependability

They don't understand how to evaluate it.

“we treat software reliability as 1”

They won't spend money on it.

“show me the money”

As long as they have their CMM rating they are happy

“never let product get in the way of process”

(Mostly) we don't have the leverage to force change

“it's not in the contract so we can ignore you” or

“show me the money”



The Problem – MBV Example

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Example: Model-Based Verification – attempted to introduce a practice of using model checking as a means of identifying errors early in the lifecycle.

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- We had evidence that the technology found significant problems much earlier in the lifecycle than techniques used by the contractors.
- **Result: push-back from the contractor that the problems we found were either not significant or were found earlier than we thought they were. Extremely defensive.**



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- Example comments from the contractor, etc:
 - “Business case for dependability cases not made. This requirement will add cost, schedule, and product overhead with no ‘value-added’ to the projects.”
 - “IFIP Working Group 10.4 is not a recognized standards body. The taxonomy of dependability, and the definition of Dependability Cases is an immature and unproven approach to software development.”
 - “Unnecessary cost burden on the Project/Program while adding no real value.



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 - “Unnecessary cost burden on the Project/Program while adding no real value.
- Result: Instead of a requirement, dependability (assurance) cases and plans were deemed a “recommended practice” and therefore ignorable by the contractors.



The Real Problem

Contractors claim that using certain dependability techniques will increase costs with not enough benefit.

For certain techniques it may be possible to show a positive return on investment to counter such arguments.

However, for others (e.g., assurance cases) we think that there is a payoff across the life-cycle but we don't have ROI numbers.

- Finding ROI numbers would presumably require conducting parallel development of a system, monitoring costs through the life-cycle.
- For the kinds of systems where the payoff is likely to be large this would take a long, long time.

We (at least I) need to find ways of showing a benefit in terms that the contractors cannot ignore, for this and other dependability-related activities.



This is already done

Contractors have been conditioned to believe that the effort of reaching SEI's CMM Level 5 in their software development processes has positive ROI.

- One reason: many acquisitions require it. Don't use it, don't get the contract. Infinite ROI.
- More seriously: there are studies that show significant positive ROI when developing using Level 5 processes.

For assurance cases and other dependability activities we need similar ways of documenting ROI (even if it ends up being negative).

As alluded above, one way out of this is to influence the acquisition process or regulators to require the use of the activity, but even then it would be nice to not have to wave hands.

