“Identifying Risks in Outsourcing Software-Intensive Projects”

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Some practical experience and insights into outsourced project risks.

- Identifies some risks inherent in subcontracting software projects.
- Serves as guideline to both software contractors and customers engaged in software contracts.
Software out-sourcing as a trend/necessity
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Some [obvious] background on software development process improvement methodologies:

- National and internal trends in process models for software development.
  (e.g., SEI’s SW-CMM models)
- Trends in process models for software acquisition.
  (e.g., SEI’s SA-CMM)
- Foci on risk management
  (e.g., SEI Risk Eval., Continuous Risk Mgt., Team Risk Mgt.)
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Report based on formal research into organizational practices and on-site (informal) observations:

- Survey/interviews of 26 orgs. About acquisition practices. (Fed. Govt., Telecomm., DoD, Financial Inst.)
- Contracts for $30K to $50M
- Projects: Business, Eng., AI/ES, Hybrids
Study focus:

- W$ to contracting organization during SDLC to acquire, manage, control, and support the software contract.
- W Time effort of personnel to support the contract.
- W Risk post-mortems.

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Some initial research observations:

- **[lack of]** Organizational awareness of models
- **[lack of]** Formal institutionalized software acquisition plans or project tracking plans
- Traditional “order and wait” scenarios
- **[lack of]** Software requirements document specificity

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Some initial research observations (continued):

- Lack of acquisition project management processes for:
  - Contract management
  - Configuration management for tracking
  - Internal/external personnel oversight processes
  - Tracking progress against requirements and costs
  - Artifact inspections
  - Risk identification and management
  - Metrics gathering

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The first part of research results [briefly]:

- The hidden costs of contracting software is substantial – mean value is 190% of the contract.

- Linear relationship between hidden costs and project size:
  \[ M = 2.2 \times \text{KLOC} + 52 \] (person months)
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The second part: Risk Identification and Management as a Major Component of Software Contracting Customer-Contractor relationships
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- **Nature** of risks in software contracting
- **Impacts** of contracting risks on organizations
- **Sources** of software contracting risks:
  - Customer: Internal Risks
  - Interface Risks
  - Contractor: Internal Risks

*Our focus*
As a customer, what are some of your internal risk sources?

- Inaccurate estimates of effort (time, scope, $)
- Personnel knowledge (software + acquisition)
- User availability and involvement
- Specification of customer (your) requirements
- Contract specificity (processes and interfaces)
- Creeping requirements
- Unanticipated coordination and oversight
What are the contractor’s internal risks?

[Ignored for this presentation – Because adherence to process models such as SEI’s CMM is meant to reduce or eliminate many of contractors risks – or provide guidelines for risk management plan.]

[BUT -- Additional problems arise if your contractor is sub-contracting!]
As a customer, what are some of the sources of risk at your interface with your software contractor?

- Mutually accepted ambiguous contract
- Ill-defined interfaces (users ... contract manager(s) ... developers ... system)
- Pathological [multiple] contacts
- Antagonistic interfaces
- Deficient inspections
- Loosely defined checkpoints
- Unavailable testing criteria, processes, data, benchmarks
As a customer, what are some of the sources of risk at your interface with your software contractor (continued)?

- Shared repositories
- Configuration management of artifacts
- Risk management [incompatible] program
- Quality assurance [incompatible] program
- Expectations of re-use and maintainability
- Missed schedules
As a customer, what are some of the sources of risk at your interface with your software contractor (continued)?

- **Costs** of tools and management software
- **Incompatible** deployment and development infrastructures
- **Security**
- **Transient** personnel
- **Unanticipated** direct costs
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As a customer, what are some of the sources of risk at your interface with your software contractor (continued)?

- Incompatible processes and standards
- Activity synchronization
- “Gutless” oversight
- Manager end-around play
- Negotiating change
- Test site requirements
- Contract termination and litigation
Conclusions:

- Process is [still] “King/Queen”
- Engage in software outsourcing only when you understand the pitfalls
- Be prepared: manage costs, manage risks
- Get it all in writing
- Avoid the “customer-victim” role.
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Questions?