Software Process Improvement and e-Business: An Oxymoron?

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I. Background
II. e-Business and the Need for Process
III. CMM Adaptations for e-Business
IV. Summary

Questions and Answers
Background
The e-Business Environment

- Internet
- Extranet
- Intranet
- Web

- Fast time to market
- Accelerated rate of change
- High quality demands
Background
Defining the Environment

Business using the internet for:
- e-commerce
- advertising
- communication

A project that has the following characteristics*:
- quick delivery
- research-like, yet mission critical
- managed in turbulent business and technology environment

*James Highsmith, Cutter Consortium, Executive Report, Vol. 1, No. 1
Background
The Controversy

Light methodologies
- Preserving flexibility
- Adaptable to changing environments

CMM Perceptions
- Based on large DoD organizations
- Focused on continuous improvement
- Promoting repeatable processes
Background
The Study

15 Software managers in e-business environments
- IT organizations
- Web page development
- Web applications
- e-Business applications
Background
The e-Business Companies

**Software development practices**

- Project plans developed
- Iterative or evolutionary lifecycle used
  - Some parallelism of phases
  - Little prototyping – mainly for proof of principle
- Effort estimates generated based on experience
- Delivery dates customer driven
- Documentation stored in libraries
- Technology introduced gradually to minimize impact
- Personnel issues identified as greatest risk
Background
e-Project Discriminators

- Insufficient skilled, experienced software engineers
- Rapidly changing technology and business environments
- Many functionally complex, interconnected systems
- Increased number of stakeholders
- Worldwide, networked connectivity
- Fuzzy requirements
- Compressed development cycle/time-to-market pressures
Need for Process
e-Project Characteristics

- Insufficient skills, experience
- Subcontract management
- Org process definition
- Training program

Impact on development
- Systems engineering inadequately performed
- Software development outsourced

Process solutions
- Training
- Hiring of experienced managers
- Documented processes
- Subcontractor oversight
**Need for Process**

e-Project Characteristics - 2

**Impact on development**
- Turbulent transitions to technologies and business models
- Frequent updates/revamping of software

**Process solutions**
- Process for introducing change
- Short development cycles
- Planning for change
- Management of requirements changes
Need for Process
e-Project Characteristics -3

complex, interconnected systems

Impact on development
- Dependent on external commitments
- System quality a product of vendor and COTs quality

Process solutions
- Risk identification and management
- Planning & tracking of commitments
- Increased importance on integration testing
Need for Process
e-Project Characteristics

increased number
of stakeholders

Impact on development
- Conflicting requirements
- Changing requirements

Process solutions
- Stakeholder buy-in/commitment
- Requirements change processes
- Conflict resolution
Need for Process

e-Project Characteristics -5

worldwide, networked connectivity

Impact on development
- Immediate distribution of information/news
- Worldwide customer base
- High visibility of SW problems

Process solutions
- Improved product quality
Need for Process
e-Project Characteristics

Impact on development
- Requirements evolving as project progresses

Process solutions
- Prototyping
- Evolutionary life cycle
- Process for incorporating requirements changes
Need for Process

e-Project Characteristics -7

Impact on development
- Insufficient testing
- Inadequate systems analysis
- Reduced project functionality

Process solutions
- Improved estimating processes
- Training
- Hiring of experienced managers
- Reduced rework
- Increased milestones for tracking progress
# CMM Adaptations

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<th>CMM Level</th>
<th>KPAs</th>
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<td><strong>Level 2: Repeatable</strong></td>
<td><strong>Requirements management</strong></td>
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<td><strong>Integrated software management</strong></td>
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<td><strong>Process change management</strong></td>
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CMM Adaptations
Requirements Management

- Processes for managing changing requirements
  - Quick turn-around process for responding to customer or market needs
- Requirements not fully defined (i.e., incomplete, fuzzy)
- Increased importance of software review of requirements
CMM Adaptations
Software Project Planning

- Detailed planning for small, manageable units of work
- Iterative or evolutionary life cycle
- Plans for introduction of technology changes
- Increased planning needs
  - Increased risks
  - Increased interfaces
  - Increased commitments
  - Changing training needs
- Schedule & budget pressures on estimates

More planning, shorter cycles
CMM Adaptations
Software Project Tracking and Oversight

- Re-evaluation of project tracking metrics
- Increased tracking of commitments and risks
- Reduced frequency of plan updates
- Increased need for communication
CMM Adaptations
Software Configuration Management

- Heavy emphasis on tools
- Wider range of controlled items
  - Voice and video objects, graphic images
  - Databases
  - Copyright releases
- Provision for fast track in change management

What constitutes a CI?
CMM Adaptations
Peer Reviews

- Modified peer review methods to accommodate smaller teams
- Expanded coverage of peer reviews
- Re-definition of “code”
The CMM can improve e-business software development, if:

- CMM practices are applied judiciously to recognize the e-business need for:
  - Improved quality
  - Reduced time to market
  - Increased productivity

- Attention is paid to recognizing the alternative practices of e-projects when satisfying CMM KPA goals.
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