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Application of Risk Management in a Net-Centric Environment

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Traditional Risk Management

- **RISK** is a measure of potential inability to achieve overall program objectives within defined **cost**, **schedule** and **technical** constraints



- **RISK MANAGEMENT** is the act of of dealing with **RISK**





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The Times ... They are Changing

Stovepipe systems seek risk avoidance ...

Controlled Environment



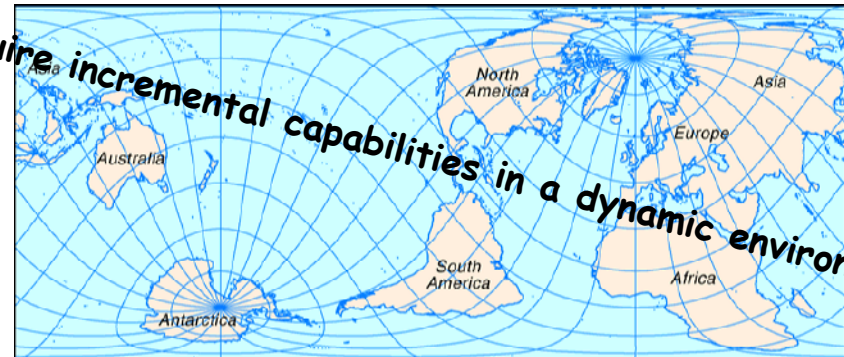
Build turn-key systems in a static environment

Risk Avoidance

Net-Centric Transformation

... An impossibility in era of Net Centricity – risk must be an accepted fact of life

Net Centric World Wide Web



Acquire incremental capabilities in a dynamic environment

Risk Management

Old risks have not disappeared and new risks abound



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Net-Centric Transformation

- **Old Information Systems World**
 - Systems oriented
 - Specific design requirements process (dream and develop)
 - R&D from scratch
 - Years spent developing entire system
 - Tightly integrated functionality
 - Test against perfection
 - System-Level Security
 - Obsolescence and disposal
 - Prescriptive Governance
- **New Net-centric World**
 - Services oriented
 - Functionality-based, “close enough” (see and use)
 - Greater use of COTS, especially for enterprise services
 - More focused on sustainability and scalable deployment
 - Dynamic functionality through composability
 - Security built in, with balanced risks
 - Living and adaptable
 - Collaborative governance

Net-Centric Environment raises different risk management challenges



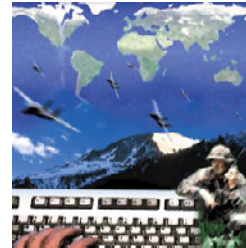
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How Is Risk Management Conditioned by Net-Centric Transformation?

- **Emphasis on the use of COTS**



- **Use of spiral, incremental capabilities development strategies**



- **Dynamic test environments**

- **Warfighter need for “early-to-market” product delivery**

- **Abbreviated Milestone development process**



- **Immediacy to vulnerability exploitation via web**

All the above and more increase pressure on risk management mitigation strategies and tactics



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Risk Management Process



How will Risk Management differ in the Net-Centric Environment?



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Notional Risk Framework for Net-Centric Environment

- **Technological Risk**
 - Standards maturity
 - Vendor products stability and interoperability
 - Scalability
 - Security challenges
- **Deployment/Provisioning Risk**
 - Predicting results of service composition
 - Testing and certification of services
 - Service Release management
 - Blend of managed services from others and own-provided services
- **Business Risk**
 - New contracting models and incentives (not LSI)
 - Cost projection not focused on development/fielding cost
 - Cost-recovery models for services
 - Market effect and agility to mature services based on usage
 - Do we understand the marketplace? Who is offering competing services? How much usage is “our” capability module getting?
- **Organizational Risk**
 - System engineering process – adapted to services model
 - Risk management process – aligned with outcomes
 - Governance process
 - Life cycle management
 - Staffing / skills / experience matches
 - Right partnerships? With industry? With other government organizations?

Capability-Based Acquisition

- Focus on outcomes linked to operational use
- Less constraining requirements place more decision options with program

Systems Engineering for Net-Centricity

- Concurrent engineering of multiple material solutions/delivery models
- Rapid fielding, agility, and service refresh must be enabled (not constrained)

Challenge: Not Just Cost, Schedule, Performance ...



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Risk Assessment for Net-Centric Environment

- **Traditional approaches still apply**
 - **Probability of occurrence**
 - **Severity of impact of occurrence**
- **But, ...**
 - **Complexity or displacement may mask effective valuation**
 - **“Contract, buy, build” decreases emphasis on development control factors (schedule and cost) and increases emphasis on performance and utility**
 - **We must learn to quantify risk in the face of more degrees of uncertainty**
 - **Looking for sources of lessons learned**
 - **Early adopters, pilots, commercial lessons learned, academic study?**

**Challenge: Credible valuation must be the foundation -
We don't know what we don't know**

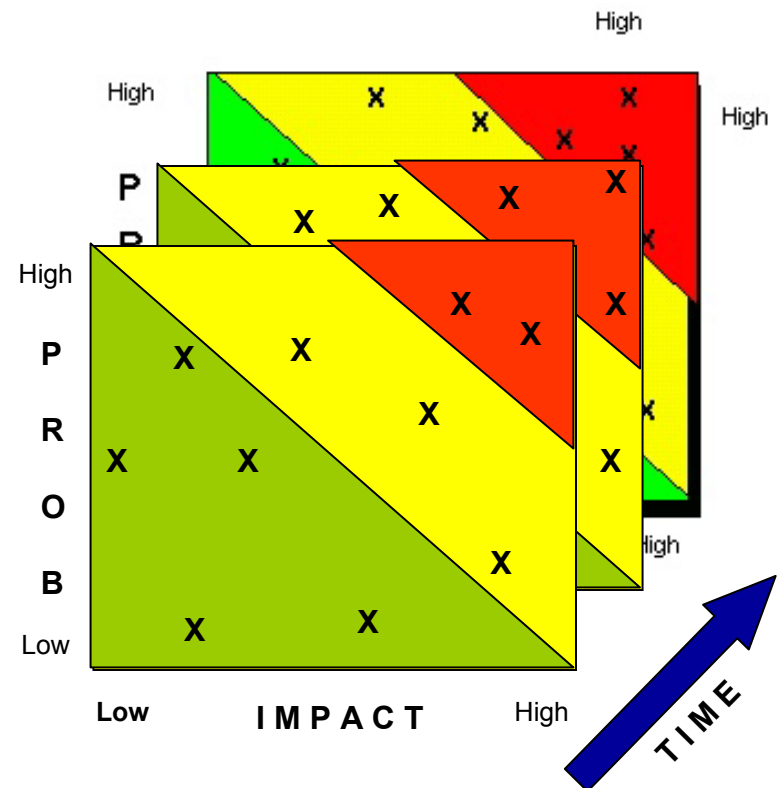


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Risk Prioritization for Net-Centric Environment

- **Prioritization: Use of a decision framework that identifies and prioritizes risks, such that**
 - Risks with greatest impact and the greatest probability of occurring are handled first
- **But ...**
 - Expand risk model elements
 - View multi-dimensionally
 - Devise new metrics for prioritizing risk
 - Results may revise material solutions and Acquisition Strategy



Challenges: Optimize ROI / Link Risks to Strategy / View risks in aggregate



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Risk Mitigation for Net-Centric Environment

- **Prioritization identifies highest-impact targets for risk mitigation**
- **Decision-makers must then lay out options for risk mitigation and consider resource investment, before choosing a course of action**
 - **Traditional Risk Mitigation options**
 - Risk avoidance (traditionally, our first option)
 - Risk transfer/distribution to another party, e.g. contractor
 - Reducing negative effect of risk
 - Accepting consequence of risk
 - **New business models may offer new options, or change our perception about acceptable mix of options**

Challenge: Finding new balance between risk mitigation and risk assumption



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Summary

- **Dynamics of net-centric environment put different pressures on risk management**
- **Old risks have not disappeared and new risks abound**
- **Emphasis shift from risk avoidance to risk management**
- **New dimensions to consider beyond cost, schedule & performance**
- **Need to continually revisit key decisions to assure they still apply**
- **Unknowns still to be investigated, studied and discussed**
- **Challenges remain in understanding complexities and implications of net-centric and service oriented architectures ...**

**Net-Centric Risk Management process ...
Challenges to address**



Challenges

- **Risk Identification: Expanding the framework beyond Cost, Schedule, Performance ...**
- **Risk Assessment: Credible valuation is the foundation - We don't know what we don't know (but we need to learn quickly!)**
- **Risk Prioritization: Still need to optimize ROI – CBA demands that we also link risks to materiel solutions strategy**
- **Risk Mitigation: Risk-averse culture must balance risk mitigation and risk assumption**

