

# SEPG 2008

## Using the Mission Diagnostic: Lessons Learned

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# Mission Success in Complex Environments (MSCE)

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Part of the Dynamic Systems Program, the MSCE Project develops methods, tools, and techniques for

- Advancing the state-of-the-practice for risk management
- Managing assurance in
  - Multi-enterprise, distributed projects and processes
  - Software-intensive systems and systems of systems

The project team builds on more than 15 years of SEI research and development in risk management

- Continuous Risk Management for software-development projects
- Operationally Critical Threat, Asset, and Vulnerability Evaluation (OCTAVE®) for organizational security



# Topics

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Background

Overview of Mission Diagnostic

Applying Mission Diagnostic

Lessons Learned

Questions



# Background

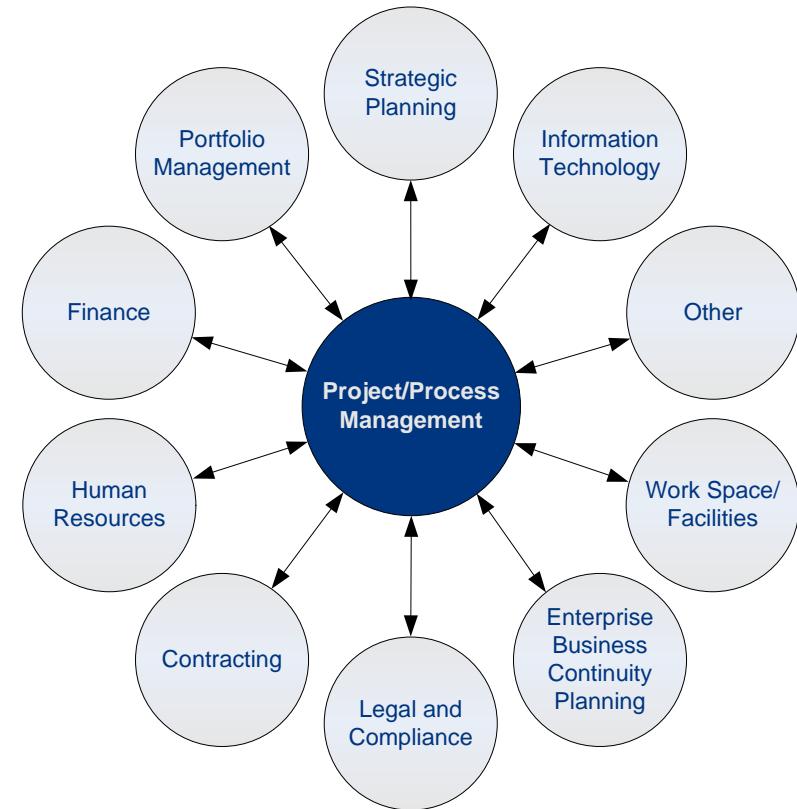


# Traditional Approaches: Projects and Support Functions

Traditional management approaches focus on issues directly under the control of projects or operational processes

Various functions within an organization that support projects and processes can increase or mitigate risk

- Some of these functions are outsourced to third parties
- Decision making is usually not well coordinated



# Distributed Programs and Operational Processes

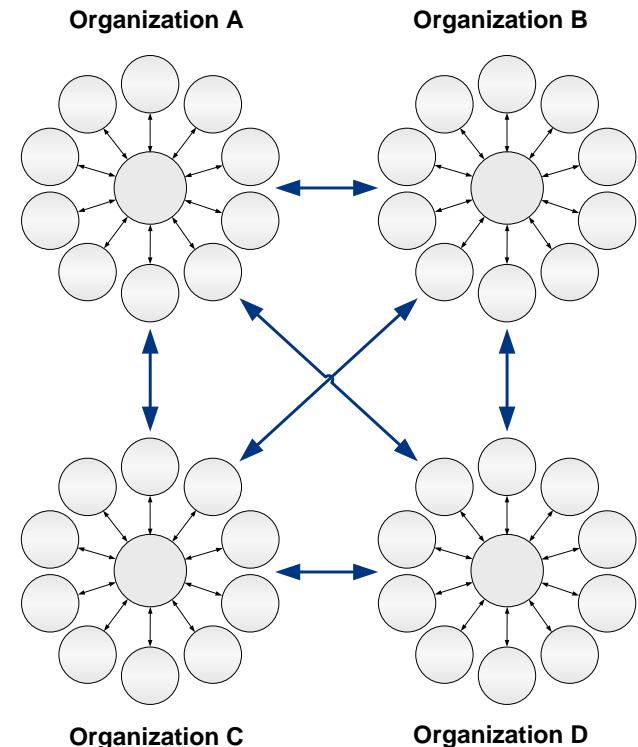
Frequently collaborative ventures with multiple organizations

Partner actions can increase or mitigate risk

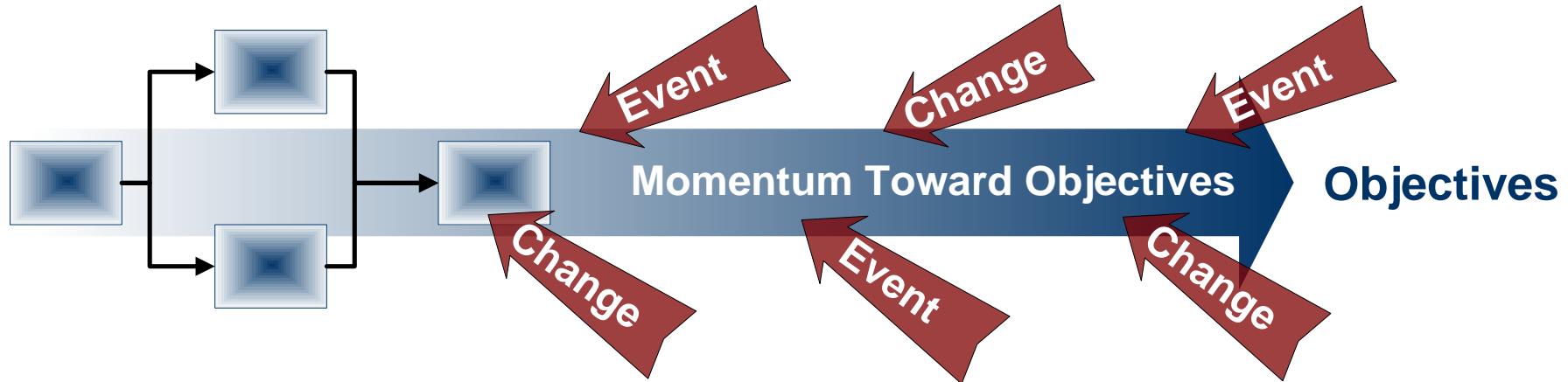
Distributed programs and processes are especially vulnerable to

- Conflicting priorities
- Uneven resource allocation
- Complex interrelationships
- Dynamic conditions

Typical consequences can include hidden risks, unmitigated risks, and locally optimized risk mitigation



# Need to Establish and Sustain Momentum Towards Success



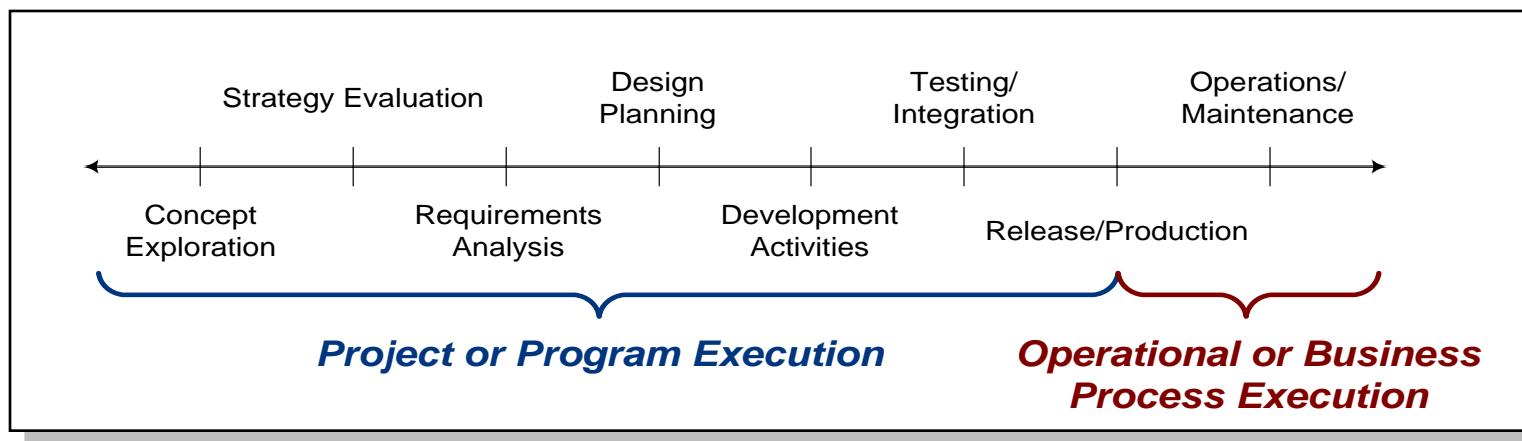
Achieving success requires

1. Establishing sufficient momentum toward objectives
2. Sustaining momentum when stressed by events
3. Sustaining momentum when circumstances change

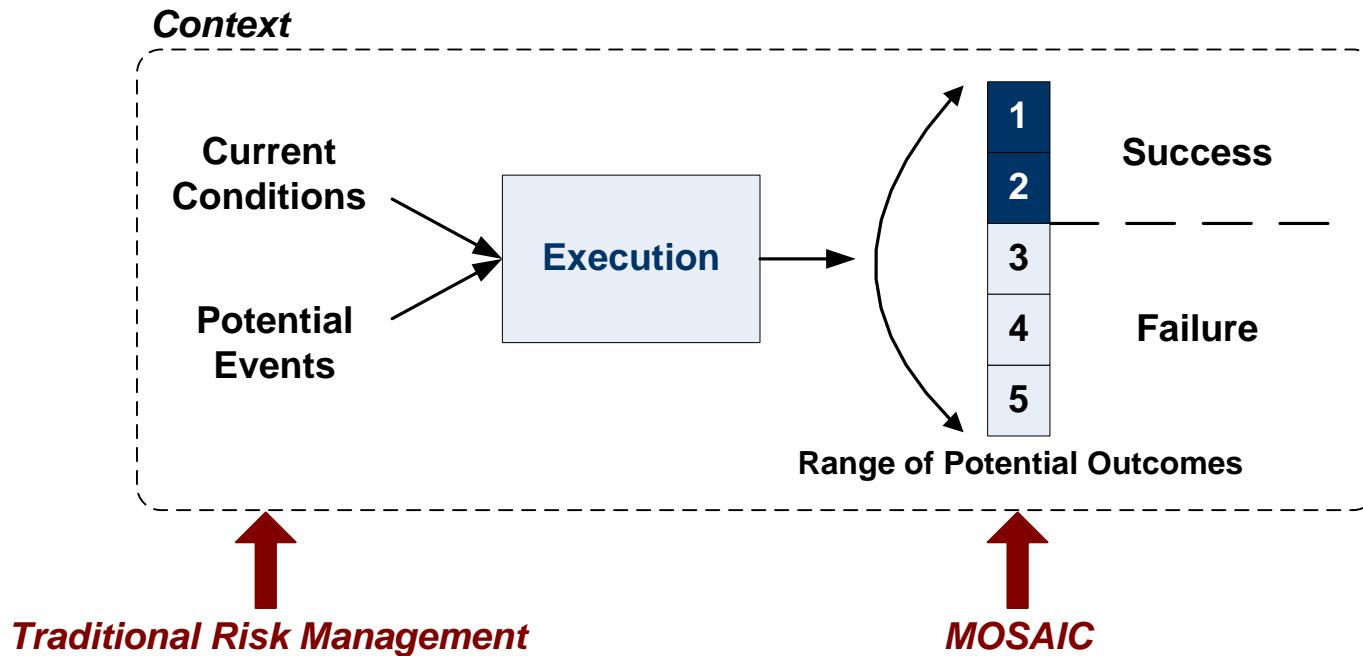


## SEI Mission-Oriented Success Analysis and Improvement Criteria (MOSAIC)

- Is a management approach for establishing and maintaining a reasonable degree of confidence that objectives will be achieved
- Comprises a suite of assessment and management methods
- Can be applied across the life cycle and supply chain



# Focus on Outcomes



Traditional risk management is focused on managing potential problems or obstacles that can lead to adverse consequences

MOSAIC is focused on managing the outcome, or result, of each project or business-process objective



# Overview of Mission Diagnostic



# MOSAIC Assessments

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**Mission Diagnostic Protocol  
(MDP)**



**Mission Assurance Analysis  
Protocol (MAAP)**



*Analysis Complexity* →

Two protocols are currently defined:

- **MDP** is a *simple, time-efficient* analysis that estimates the potential for success for a project or process based on a small set of key drivers
- **MAAP** is an *in-depth, complex* analysis that determines the potential for success for key objectives in distributed environments based on both key drivers and an operational model



# Potential for Success

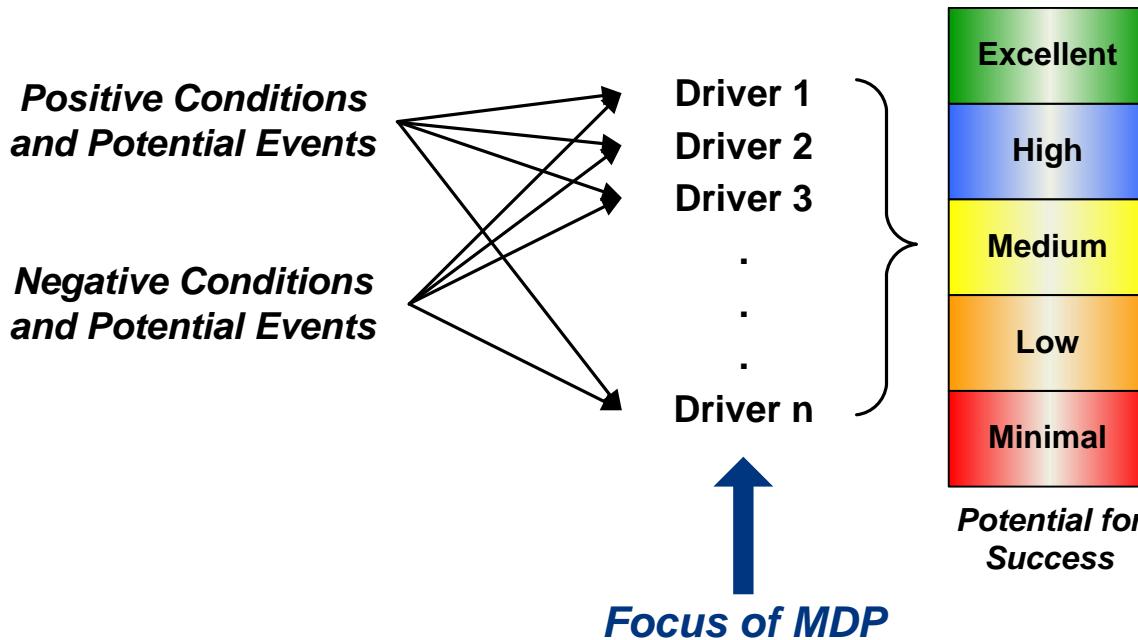
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The likelihood that an objective will be achieved

Excellent	The objective will almost certainly be achieved.
High	The objective will most likely be achieved.
Medium	The objective is just as likely to be achieved as not.
Low	The objective will most likely <u>not</u> be achieved.
Minimal	The objective will almost certainly <u>not</u> be achieved.



# Applying MDP



The potential for success is determined by

- Evaluating a small set of key drivers of success or failure
- Applying a simple algorithm to determine the potential for success



# What Are Drivers?

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A driver is a condition or circumstance that influences the outcome of a project or business process

- A ***success driver*** guides a project or business process toward a successful outcome
- A ***failure driver*** guides a project or business process toward an unsuccessful outcome

Each project or process has a mixture of success and failure drivers influencing the eventual outcome

Drivers are used to estimate the degree of momentum toward project or business-process objectives



# Consider a Wide Range of Drivers



You need to analyze a wide range of success and failure drivers



# Generic Set of Drivers

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1. Are project goals realistic and well-articulated?
2. Are communication and information sharing about mission activities effective?
3. Are customer requirements and needs well understood?
4. Are organizational and political conditions facilitating completion of project activities?
5. Is the project plan sufficient?
6. Does project management facilitate execution of tasks and activities?
7. Is task execution efficient and effective?
8. Is staffing sufficient to execute all project activities?
9. Are the technological and physical infrastructures adequate to support all project activities?
10. Are changing circumstances & unpredictable events effectively managed?



# Evaluating Drivers

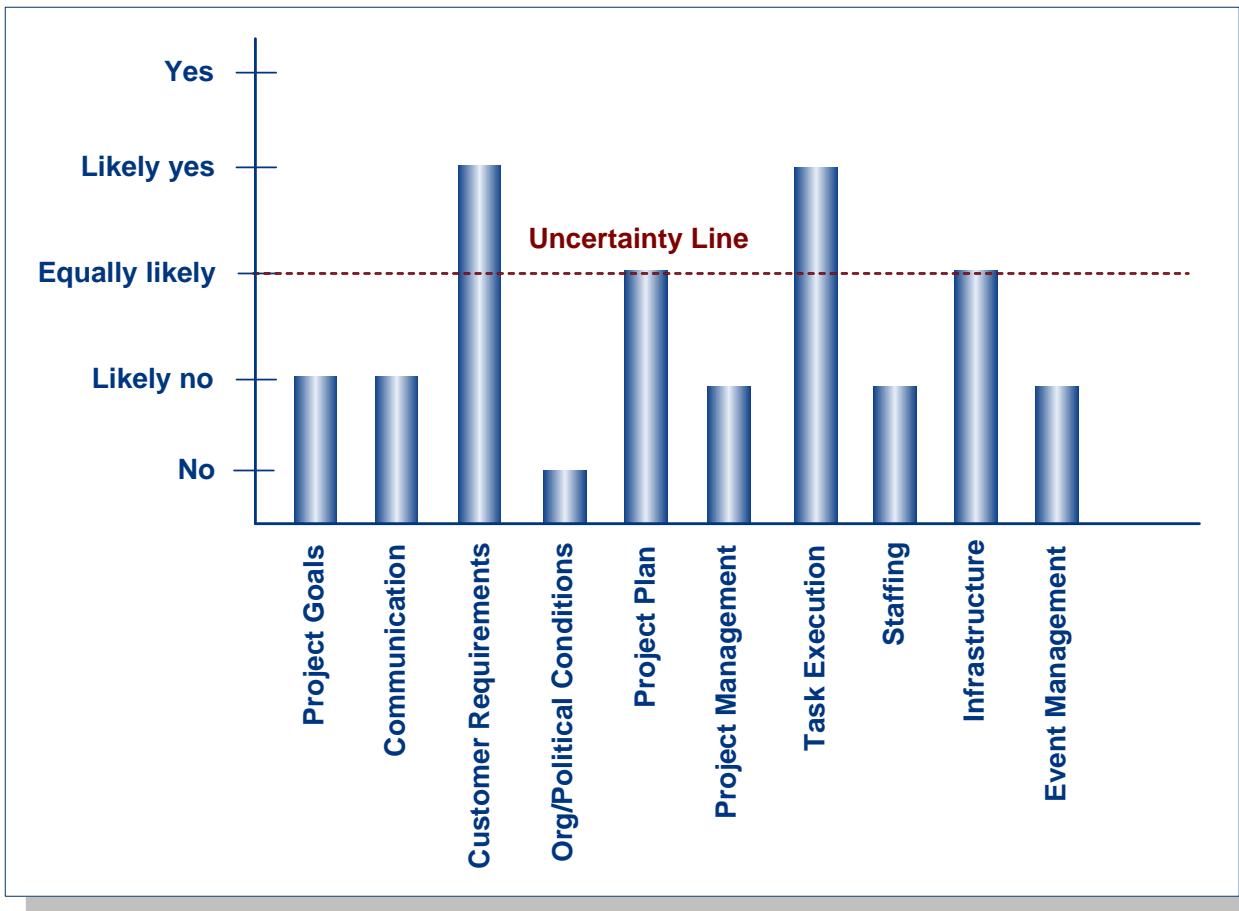
Question	Answer				
	No	Likely no	Equally likely	Likely yes	Yes
1. Are project goals realistic and well-articulated?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Each driver is evaluated based on the data collected

Probability is incorporated into the range of answers for each driver



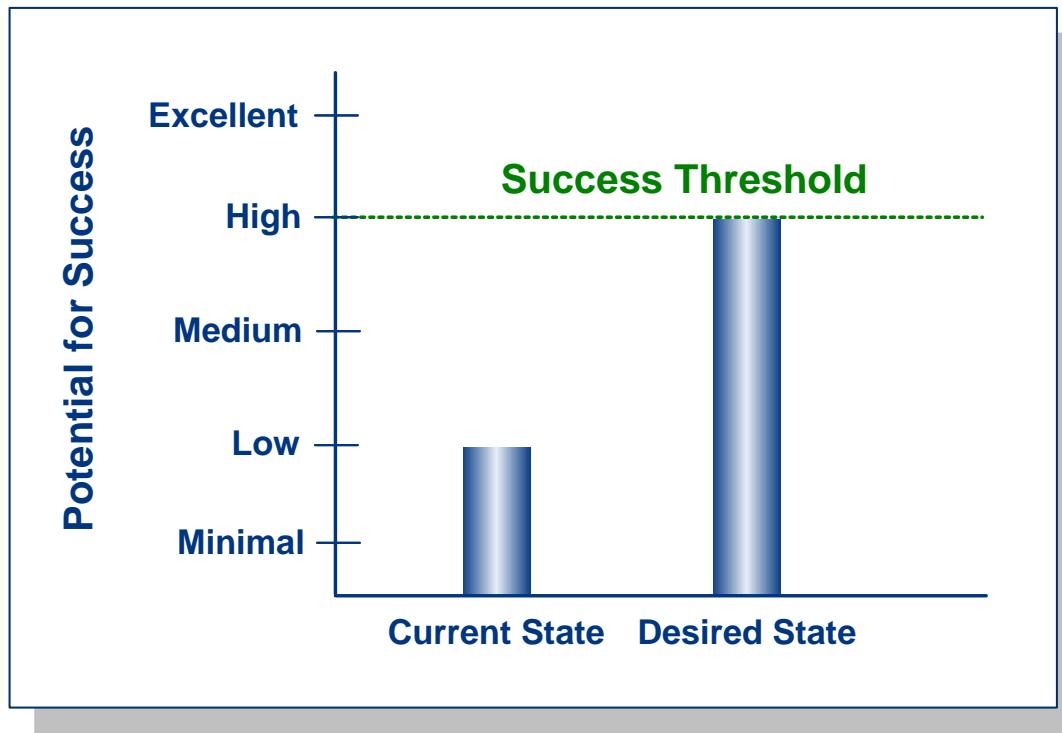
# Analyzing Project Drivers



A simple analysis provides insight into the potential for success



# Managing the Potential for Success



The potential for success is the likelihood that the desired outcome will occur  
The goal is to ensure that the potential for success is within tolerance



# Applying Mission Diagnostic



# Applications of Mission Diagnostic

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We have applied Mission Diagnostic (MD) in the following domains:

- Cyber-security incident management
- Software development portfolio management
- Software development and deployment

MD proved to be an effective in all cases

For each domain, we tailored the MD drivers and some of our techniques



# Cyber-Security Incident Management

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We used MD as an adjunct to a detailed functional assessment to provide a broad, risk-based view of the response team's potential for successful operations

- Identified 10 drivers
- Additional 5-10 minutes per interview using broad questions

Assessed operational processes and practices used

- To prevent, detect, and respond to incidents
- For various types of events and incidents

Method was transitioned to incident response team experts for further use



# Software Development Portfolio Management

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Customer wanted a quick, risk-based means of sorting through various software development projects based on their potential return-on-investment and risk at different points in their life-cycles

- Identified 14 drivers based on previous successes and failures
- Conducted face-to-face interviews

Transitioned method to client at the end of the first pilot



# Software Development and Deployment

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Used MD for a rapid, high-level assessment of the potential for a successful deployment of a software-intensive system

- Identified 18 drivers, with a particular focus on deployment concerns
- Conducted interviews using teleconferencing to keep costs down



# Lessons Learned



# Self-Application

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MD assessments can be self-applied

- Simple, algorithmic aspect
- Generic set of 10 drivers is useful in most applications\*
- You do not have to be an expert in MD to get actionable results

We have successfully transitioned  
tailored MD assessments to customers



*\* Tailoring drivers does require some expertise and experience*



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# Number of Drivers

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Time-efficiency is a key aspect of a MD assessment; keeping the number of drivers small is essential

Between 10 and 15 drivers will generally provide good results

We have successfully used 18 drivers



# New Sets of Drivers

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We began with a generic set of 10 drivers, then...

- Tailored the generic drivers to create a 10 driver set for *cyber-security incident management projects*
- Developed a new set of 14 drivers with a focus on ROI and other business concerns for *software development portfolio management*
- Developed a new set of 18 drivers focusing on technical and programmatic concerns for *system development and deployment projects*



# On-Site Interviews and Teleconferencing

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Usually used on-site interviews, requiring from 10 to 45 minutes, depending on the number of drivers

- On-site interviews can be more effective, but are harder to schedule and can require additional expenses
- Teleconferences were just as effective, but did raise issue of being unsure who was really on the other end of the phone
- In cyber-security, we used only 4-5 questions to *collect* information for the 10 drivers; other information came from the parallel, in-depth assessment

All techniques were effective at raising concerns, strengths, and issues



# Algorithmic Analysis

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MD assessments use simple algorithms to calculate the potential for success

- Does not require extensive risk or assessment experience to use
- Basic means of identifying potential for success
- Results are sufficient for managers to determine where to make improvements
- Provides only a broad view of the potential for success

More complex/advanced analyses would be needed to provide a more refined view or to consider alternative outcomes

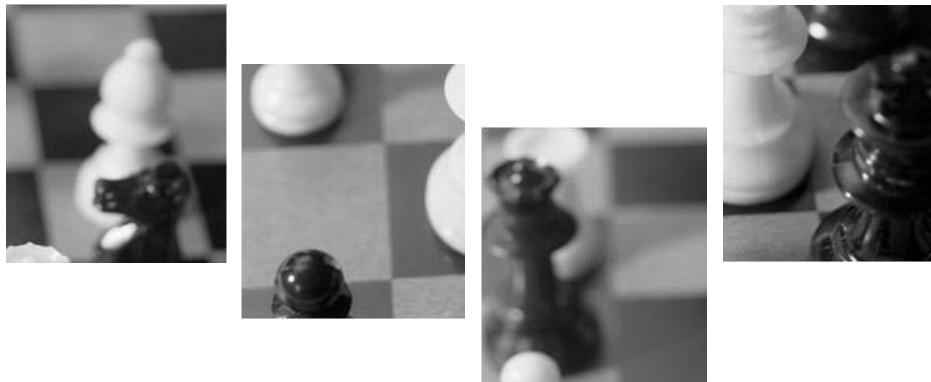


# Outcome-Based Scenario Analysis

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For software development and deployment projects, we borrowed *outcome-based scenario analysis* from the more complex MAAP assessment

- Determined minimal, moderate, and good pictures of success and the potential for each to occur
- Able to show that at least some type of success was possible
- Requires additional expertise to identify and assess alternative scenarios



# Useful Complement to In-depth Assessments

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When used with the in-depth functional assessment for cyber-security incident management teams, MD provided a useful, alternative view into the current state of the team and its operational processes

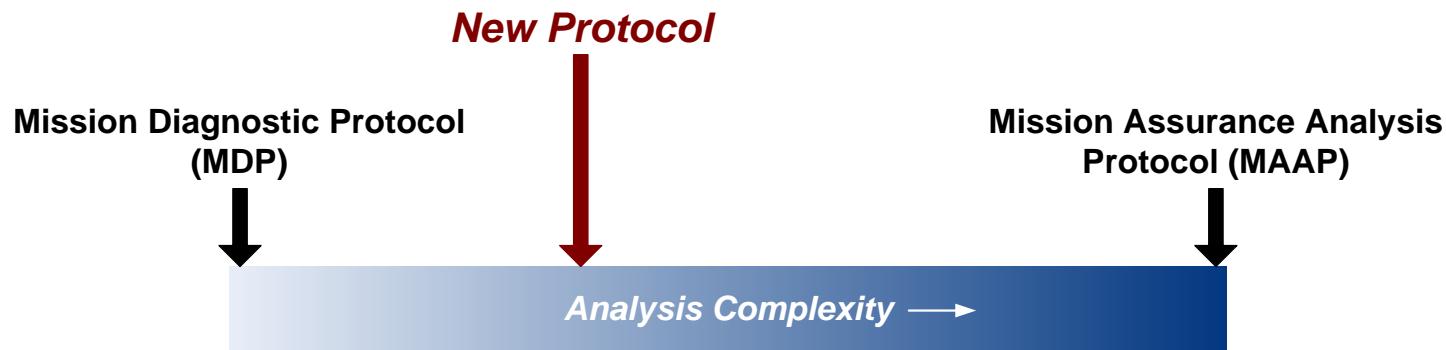
- Easier to understand the key issues and risks (10 or less)
- Senior management quickly understood the situation and what was needed for improvements
- MD results were used by senior managers to deal with risks that were beyond the control of the technical/project leads
- Drivers provided a more effective means of quickly communicating risk between senior managers and technical/project leads

In-depth assessment results were used by technical/project leads to conduct localized improvements



# New Areas of Research and Development

From the software development and deployment project, we will create a new assessment protocol that blends MD and MAAP



- Working with different layers of information, responsibility, communication, and risk mitigation across and within organizations has started research into a new taxonomy for success management based on conditions and events
- We will be conducting research into using the MD as a basis for continuous management of project and process risk.



# You Don't Need Detailed Assessments...

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...to see you are going in the wrong direction!

A quick, efficient assessment like the MD can reveal if you are generally heading for success or failure

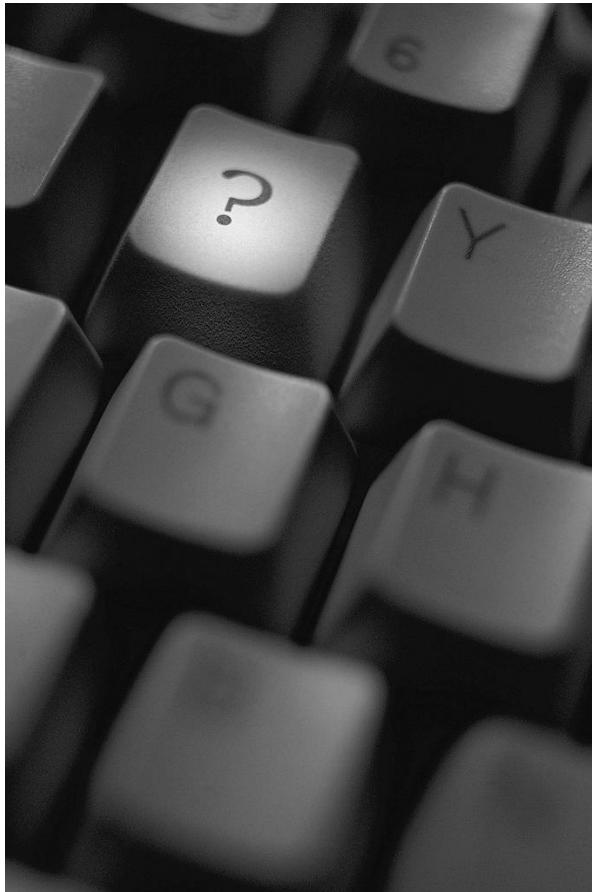
- Point out areas that need to be improved
- Identify general areas that could benefit from detailed analyses or assessments (e.g., a security assessment)

A quick assessment of your current state can make you stop and think...and, sometimes, that's what you need the most



# Questions

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# For Additional Information

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