

Group Discussion:
Formulating the Problem &
the Strategy for Solution

23 April 2002

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 23 APR 2002	2. REPORT TYPE N/A	3. DATES COVERED -	
4. TITLE AND SUBTITLE Group Discussion on Formulating the Problem and the Strategy for Solution		5a. CONTRACT NUMBER	
		5b. GRANT NUMBER	
		5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)		5d. PROJECT NUMBER	
		5e. TASK NUMBER	
		5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) MITRE 7515 Colshire Drive, MS N650 McLean, VA 22102-7508 USA		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)	
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited			
13. SUPPLEMENTARY NOTES See also ADM001657., The original document contains color images.			
14. ABSTRACT			
15. SUBJECT TERMS			
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	UU
			18. NUMBER OF PAGES 20
			19a. NAME OF RESPONSIBLE PERSON

Goals

- Elicit how the draft CoBP might be
 - Added to
 - Subtracted from
 - Modified
- Identify steps that might be taken to further illuminate or clarify the subject
- Identify key issues that might be the subject of future SAS panels

Agenda

- Problem Formulation (What & Why)
 - Context
 - Aspects of the Problem
 - Principles of Problem Formulation
 - C2 Assessment
 - OOTW C2 Assessment
 - Bounding the Problem
 - High Level MoM
 - Tools for Problem Formulation
- Solution Strategy (How)
 - Developing a solution strategy
 - Study Management Plan

Context

- Four *contextual* areas have been identified
 - Geopolitical
 - Analysis aim, objectives
 - Generic C2 issues
 - Relevant prior studies

Are these areas necessary and sufficient?

Aspects of the Problem

- Five *aspects* of the problem have been identified
 - Issues to be addressed
 - Assumptions
 - High level MoMs
 - Independent variables
 - Constraints on the variables
- Statement: “The problem is not formulated until the Assessment Team has specified each aspect of the problem” -- *Do you agree or disagree?*

Principles of Problem

Formulation: C2 Assessment

- Do it prior to developing concepts for analysis or model selection
- Understand the decisions to be supported and stakeholder viewpoints
- Carefully review previous work
- Do analysis *and* synthesis
- Be broad and iterative
- Practical constraints are modifiers, not drivers
- Address risks to the study explicitly

Is this list correct and comprehensive?

Principles of Problem Formulation: OOTW C2 Assessment

- Address the
 - Geopolitical context
 - Generic C2 issues
- Look at the policy level impacts (i.e., MOPEs)
- Recognize that history can be important
- Do not focus in too soon
- Employ a broad range of disciplines on the team

Is this list correct and complete?

Assembling a Multi-Disciplinary Team Can Be Challenging...



“But I don’t want to do C2 assessment!”

Notes for Slide 9

As many of you know, members of the Synthesis Panel have a “daytime job” and a “night-time job”. During the day, each member of the panel is assigned to one of the six mission oriented panels. During off-hours we meet to share insights and develop a holistic view of the subject. Thus, recruiting can be difficult, requiring unorthodox approaches.

Bounding the Problem

- Explore and understand the significance of each boundary before making assumptions about it
- Recognize that in formulating an OOTW problem, we are trying to bound a complex system
- Avoid the trap of over-specification
- Care must be taken to avoid coming to closure prematurely

Comments?

High Level MoM

- In order to construct appropriate MoM, conduct a structured analysis of potential benefits; causally map
 - Lower level MoM (that can be related to investments or other action) to
 - Higher level MoM (that can be valued by decisionmakers)

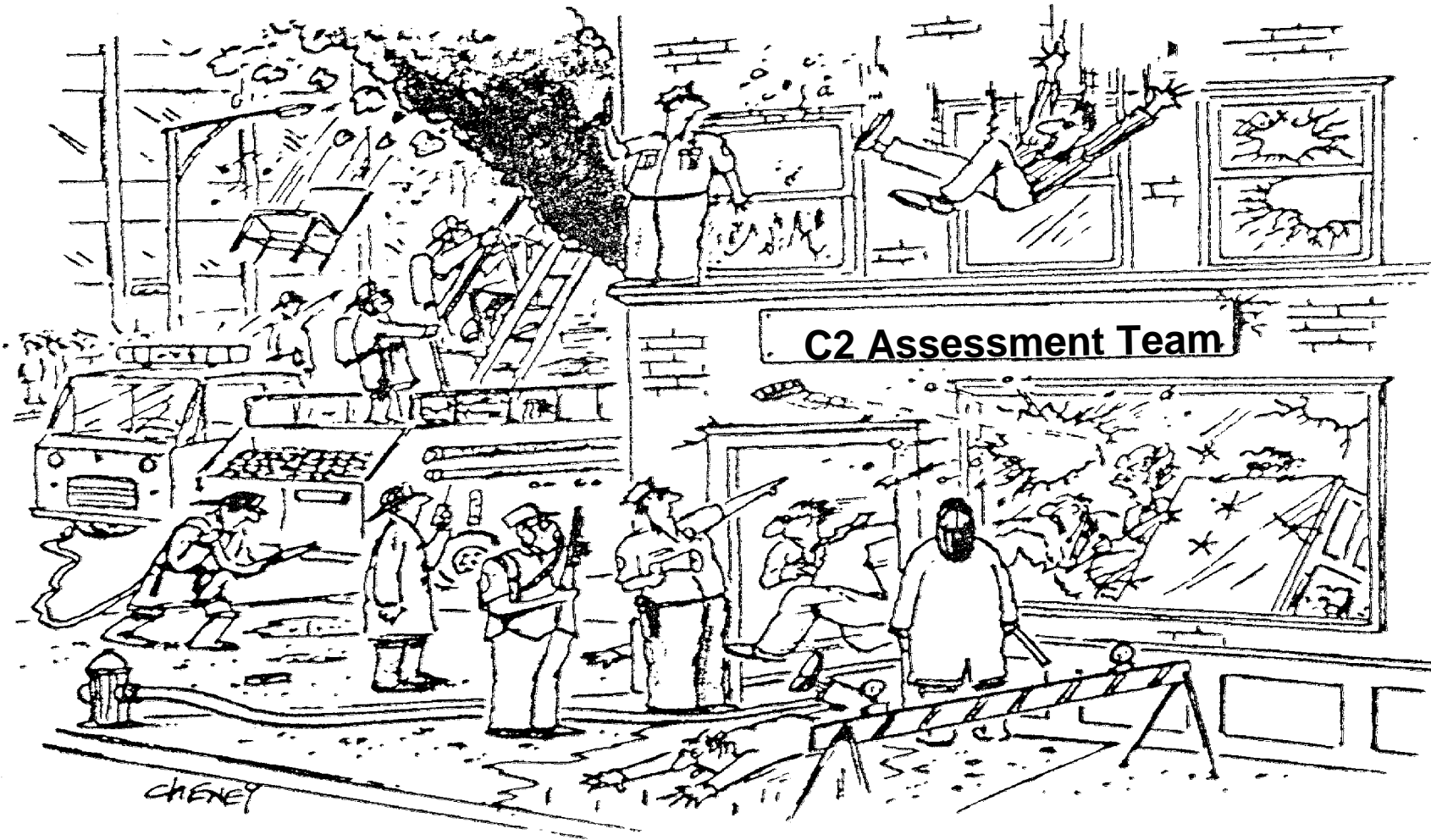
Comments?

Tools for Problem Formulation

- Several tools were cited; e.g.,
 - Elicitation support
 - Influence diagrams
 - Casual maps
 - System dynamic models
 - Agent based ‘distillations’

Are there any other important tools to cite?

The C2 Assessment Process Can Be Chaotic Without a Solution Strategy



Notes for Slide 14

In contrast to the other panels, the Synthesis Panel was very tactical in its operations (i.e., it responded to the “crisis de jour”).

Developing a Solution Strategy

- A solution strategy must be *iterative*, consisting of
 - The detailed specification of the MoM
 - The development of a conceptual model (including the relevant human and organisational factors)
 - The specification of a set of scenarios
 - A data collection and analysis plan (including the methods and tools to be used)
- The strategy needs to be *tested* to see if it addresses the issues at hand
 - Within schedule and resource constraints
 - With acceptable levels of uncertainty and risk

Do you concur?

Study Management Plan

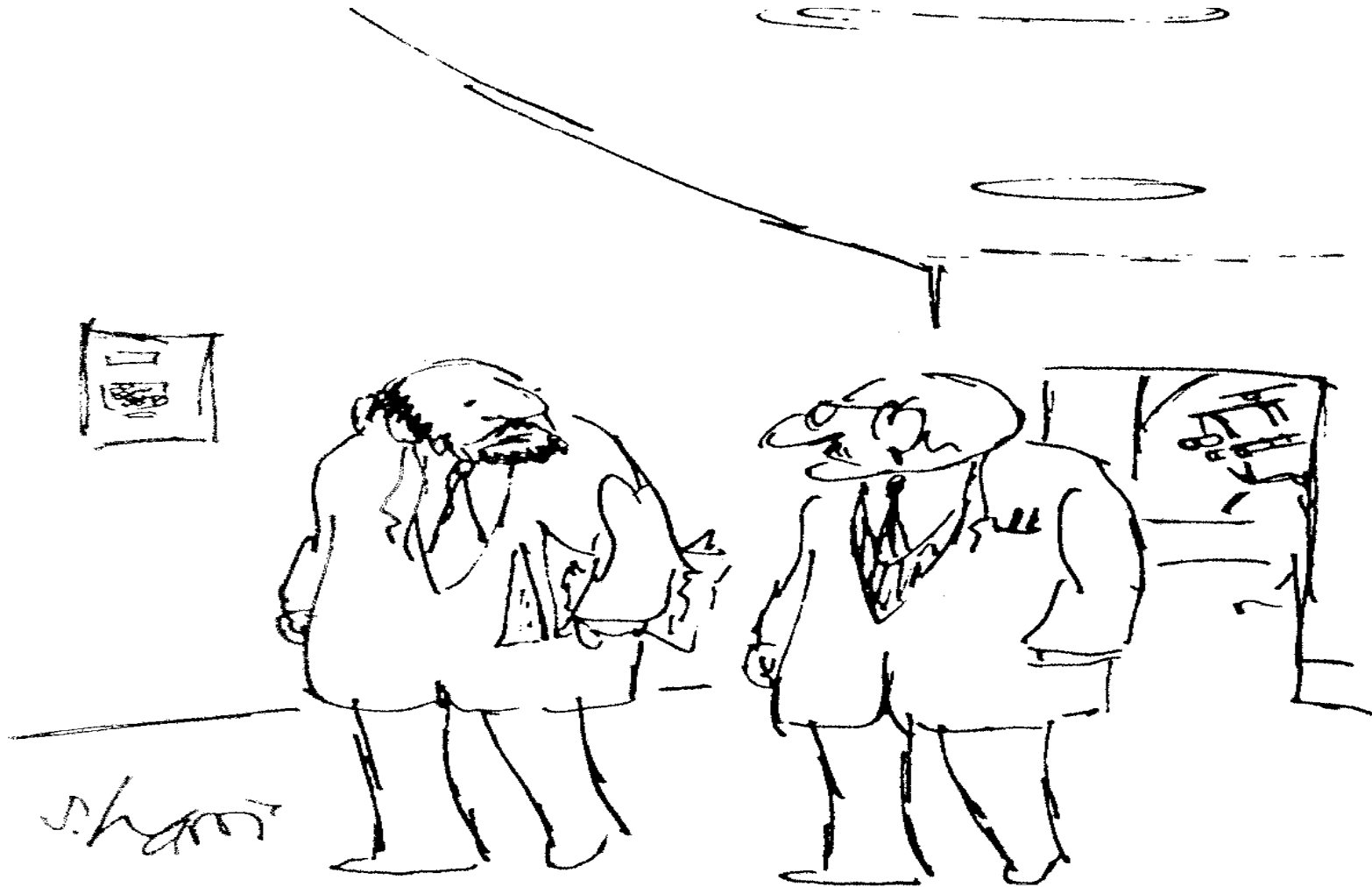
- The team should create and maintain a Study Management Plan that contains
 - Study glossary
 - Analysis plan
 - Tool deployment and modelling and simulation plan
 - Data collection/engineering plan
 - Configuration management plan
 - Study risk register
 - Quality assurance plan
 - Security plan
 - Review plan
 - Plan of deliverables

Is this list correct and complete?

Summary

- Comments?
- Questions?
- Areas of concern?

C2 Problem Formulation Tends to be Complex, Poorly Defined



**“Vacuums, black holes, antimatter, C2 problem formulation —
It’s the elusive and intangible which appeals to me”**

Group Discussion on “Formulating the Problem and the Strategy for Solution”

Stuart Starr

MITRE

7515 Colshire Drive, MS N650

McLean, VA 22102-7508

USA

starr@mitre.org

*This paper was received as a PowerPoint
presentation without supporting text.*

This page has been deliberately left blank

Page intentionnellement blanche