Wargame DCMP and Design

13 Dec 2017

Connections, Oz

Five Phases of Wargame Creation and Planning
(Major tasks, not all inclusive)

Initiate	Design	Develop	Conduct	Analyze
Develop Relationship with Sponsor	Determine Scenario	Playtest all components of wargame (1 of 3)	Collect Data	
Form Core Wargaming Team	Choose Adjudication Models, Methods, Tools	Playtest all components of wargame (2 of 3)	Manage Players	
Determine Sponsor's Objective and Issues	Determine Player Roles Required		Exercise Contingencies (as necessary)	Review and Process Data
Scope Problem	Determine Wargame Data Reqts	Blind Playtest wargame	Develop Quick Look Report	Develop Final Results
Create Data Collection and Management Plan		Full Dress Rehearsal of wargame		Develop Final Report

The Data Collection and Management Plan (DCMP)

- The DCMP is the foundation upon which a wargame is designed.

- The DCMP decomposes the sponsor's **objective and issues** into the information (**data**) that needs to be collected from the **players and the wargame's Methods, Models, and Tools (MMTs)**.

- There is no known 'standard' format for a DCMP. System wargames usually have a more straightforward DCMP, seminar games are typically more abstract.

The type of game, information format (closed/open), players required, MMTs needed, and data collection techniques employed will all be informed by the completed DCMP.

The Data the DCMP must specify

- **Initiation Data**: The data needed before the wargame begins will consist of the data that the players will need to understand their roles and make the decisions the wargame will require as the wargame begins and the data that any method, model, or tool (MMT) will need to be ready to function when called upon anytime during the wargame's execution.

- **Feedback data**: Data that informs the players on the outcome of their decisions. This data is needed to keep the players engaged and to keep the wargame progressing, and is usually produced <u>during the wargame</u>. The challenge for the wargame design team is developing a means to produce and collect this data quickly and then communicating the appropriate data back to the players.

- **Analysis Data**: This is the data that the wargaming team decided up front would be needed in order to produce the wargaming results that answer the sponsor's issues and meet the sponsor's objective for the wargame. <u>This is the data that the wargame is designed to produce</u>. This data may be collected or produced in many forms and by multiple sources.

Feedback Data is almost always Analysis Data as well, so maintain a record of Feedback Data provided to players.

Data Collection and Management Plan

Issue #	ISSUE	SUB-ISS#	SUB-ISSUE	EEA#	EEA	MOM#	MEASURE OF MERIT	Data Element #	DATA ELEMENT	DATA SOURCE	LOCATION	EVENT / TIME
	BATTLE COMMAND DATA COLLECTION MATRIX											
	Overarching Issue: How does the Armies' C4ISR architecture enable the commanders to execute effective battle command?											
BC1	*Situational Awareness: Do the Armies' organic sensors enable sufficient coverage and persistent ISR?*											
		BC1.1	What coverage is provided over time?	BC1.1.1	How does the coverage compare to the requirements identified in the CCIR and the NAI/TAI requirements identified in the collection plan?	BC1.1.1.1	Identify information obtained by the Armies to satisfy CCIR over time (PIR, FFIR).					
						BC1.1.1.2	Number of CCIR satisfied by the Armies by sensor type over time.					
						BC1.1.1.3	Identify CCIR (PIR, FFIR) shortfalls over time.					
						BC1.1.1.4	Number and type of Red units about which intelligence is available over time.					
						BC1.1.1.5	Number of first detections provided by organic Armies' sensors against CCIR over time.					
BC2	*Mission Assessment:*											

Source: ABCA Analysis Handbook (ABCA Pub 354)

BATTLE COMMAND DATA COLLECTION MATRIX

Overarching Issue: How does the Armies' C4ISR architecture enable the commanders to execute effective battle command?

Issues (from Sponsor)
Sub-Issues (Wargaming Team)
EEAs (Wargaming Team)
Information wargame produces

And Then a Miracle Occurs...

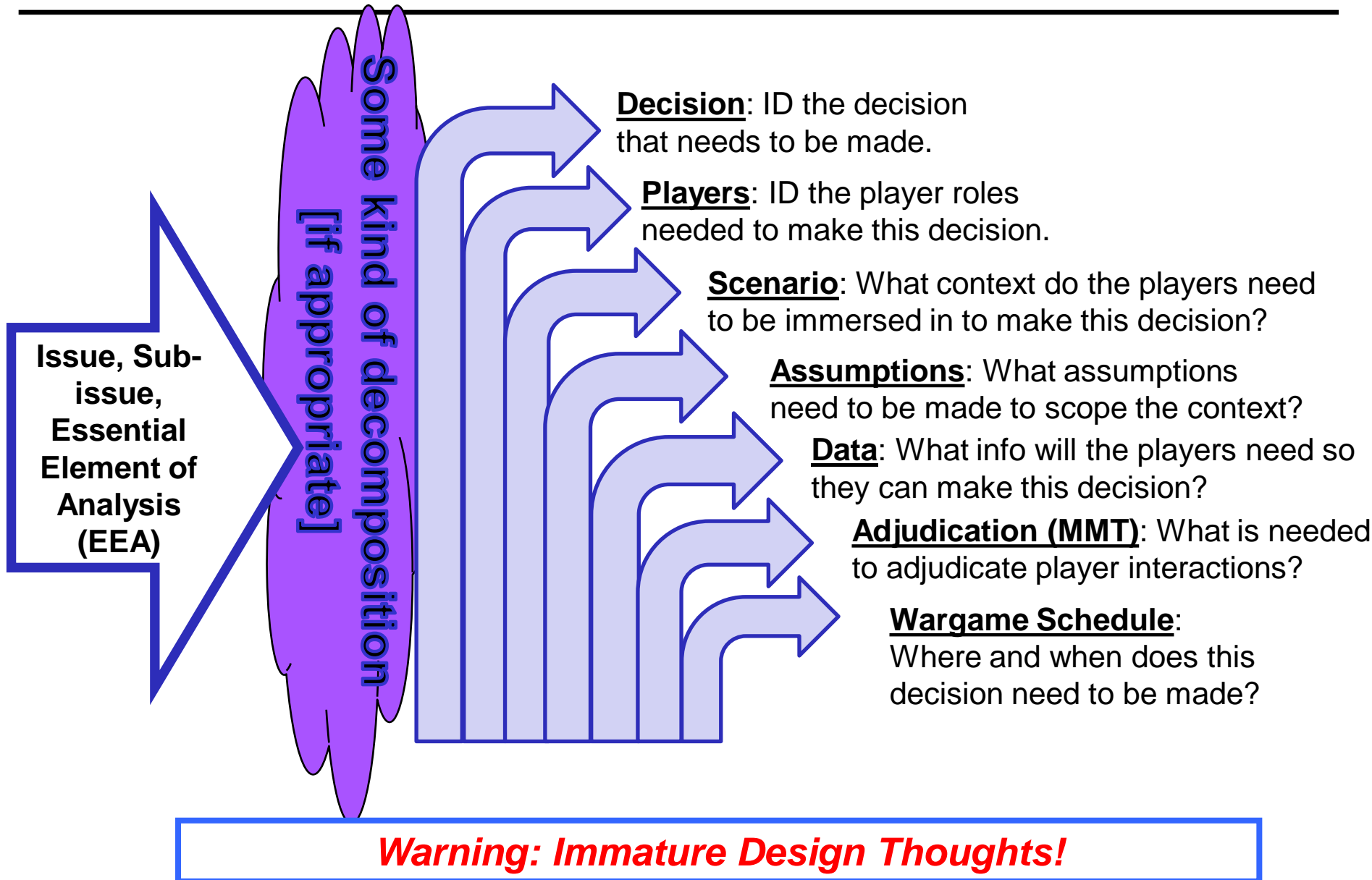Scenario(s) and Vignettes

Wargame Type

Players

MMTs

A non-decomposable set of issues may require some other techniques to connect the sponsor's issues with the information the wargame players must produce…

DCMP to Measurement Space

Issue, Sub-issue, Essential Element of Analysis (EEA)

Some kind of decomposition [if appropriate]

Decision: ID the decision that needs to be made.

Players: ID the player roles needed to make this decision.

Scenario: What context do the players need to be immersed in to make this decision?

Assumptions: What assumptions need to be made to scope the context?

Data: What info will the players need so they can make this decision?

Adjudication (MMT): What is needed to adjudicate player interactions?

Wargame Schedule: Where and when does this decision need to be made?

Warning: Immature Design Thoughts!

Wargame Design Principles

- **Specify Objective and Issues.**

- **Identify**
  - **players,**
  - **their game roles, and**
  - **the decisions they will be expected to make which might include:**
    1. **the decision,**
    2. **the conditions under which the decision was made,**
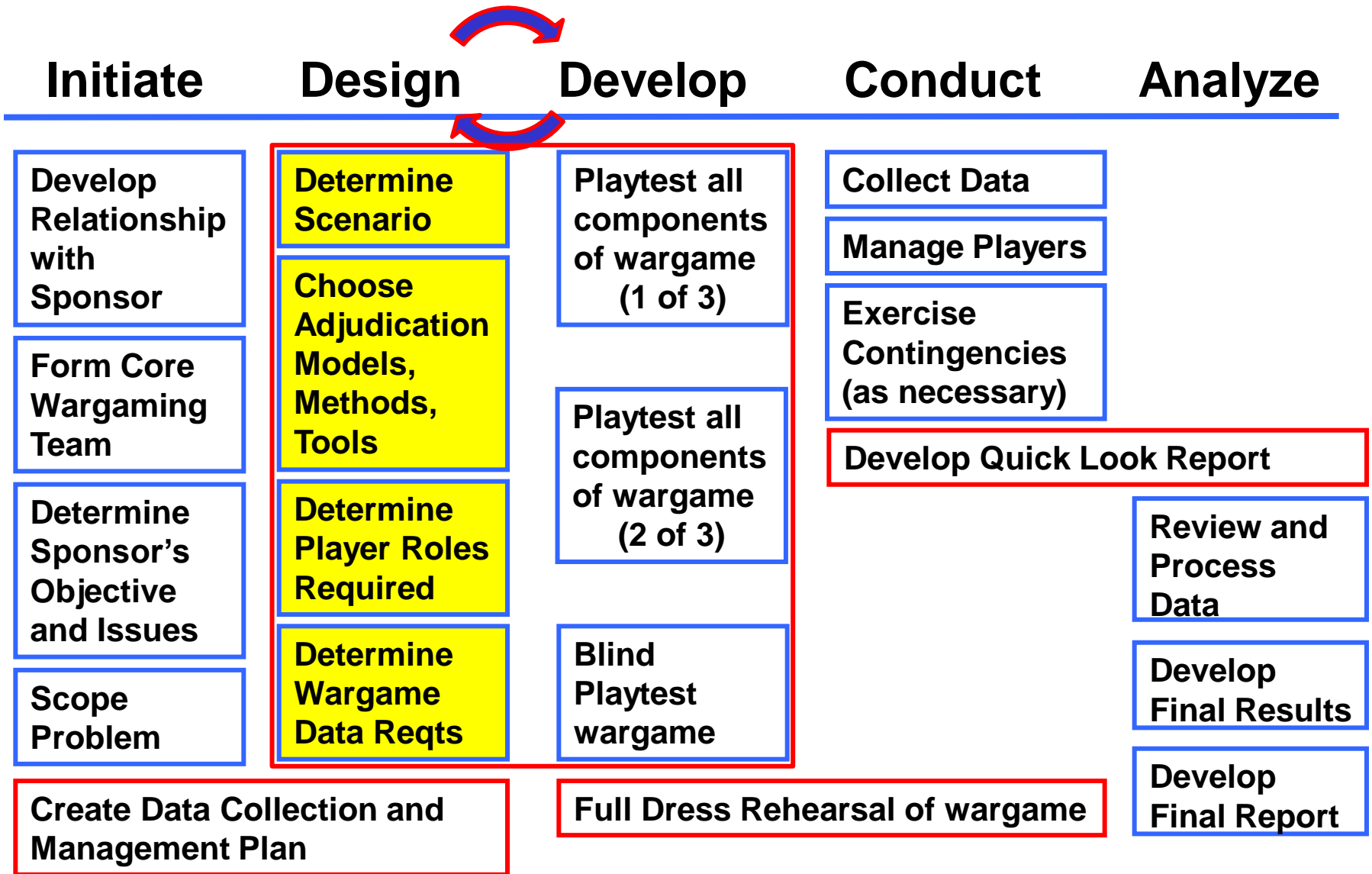   3. **information available and/or missing.**

    These three elements inform the _analysis data_.

- **Determine and collect _initiate data_ the players will need to make decisions.**

- **Identify _feedback data_ required to achieve the game's objectives.**

- **Devise the MMTs needed to adjudicate the results of player decisions.**

- **Document the results of the effort (the wargame design: rules, procedures, assumptions, etc.).**
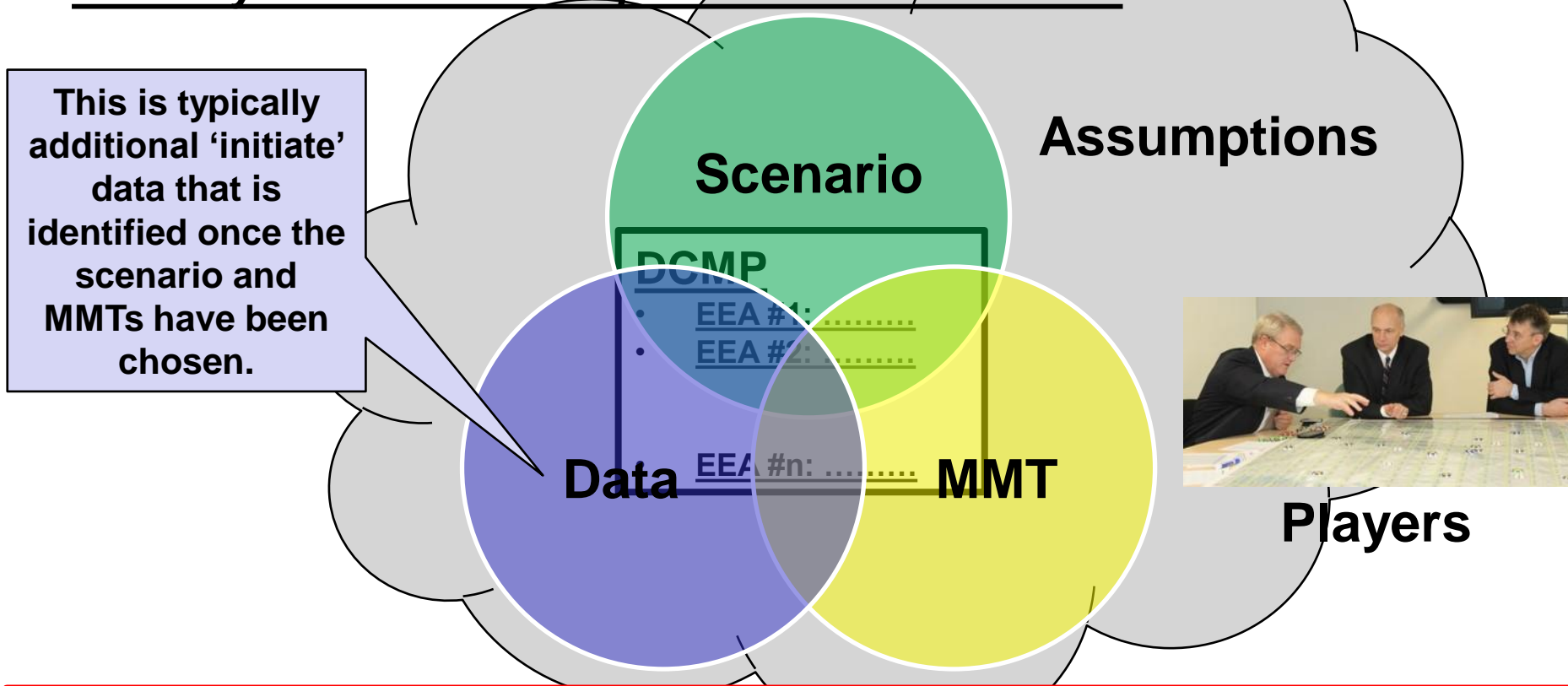
Five Phases of Wargame Creation and Planning
(Major tasks, not all inclusive)

Initiate	Design	Develop	Conduct	Analyze
Develop Relationship with Sponsor	**Determine Scenario**	**Playtest all components of wargame (1 of 3)**	**Collect Data**	
Form Core Wargaming Team	**Choose Adjudication Models, Methods, Tools**		**Manage Players**	
Determine Sponsor's Objective and Issues	**Determine Player Roles Required**	**Playtest all components of wargame (2 of 3)**	**Exercise Contingencies (as necessary)**	
Scope Problem	**Determine Wargame Data Reqts**	**Blind Playtest wargame**	**Develop Quick Look Report**	**Review and Process Data**
Create Data Collection and Management Plan		**Full Dress Rehearsal of wargame**		**Develop Final Results**
				Develop Final Report

Measurement Space

- **Measurement space** is a function of the scenario, MMTs, and data used in an analytic study. The objectives of the study can only be met if the measurement space _allows enough latitude to permit the systems under study to be assessed throughout a sufficient range of the systems' critical capabilities and attributes_.

This is typically additional 'initiate' data that is identified once the scenario and MMTs have been chosen.

Assumptions

Scenario

DCMP
- EEA #1: ....
- EEA #2: ....

EEA #n: ....

Data

MMT

Players

BEST PRACTICE: Build the Scenario, Database and MMTs so you can collect the information (via the DCMP) that will allow you to answer the sponsor's objectives!

Sponsor

Analysis Team distills DCMP into Results that answer sponsor's objective and issues.

Wargaming Team

Scenario

DCMP
- EEA #1: ....
- EEA #2: ....

Data   EEA #n: ....   **MMT**
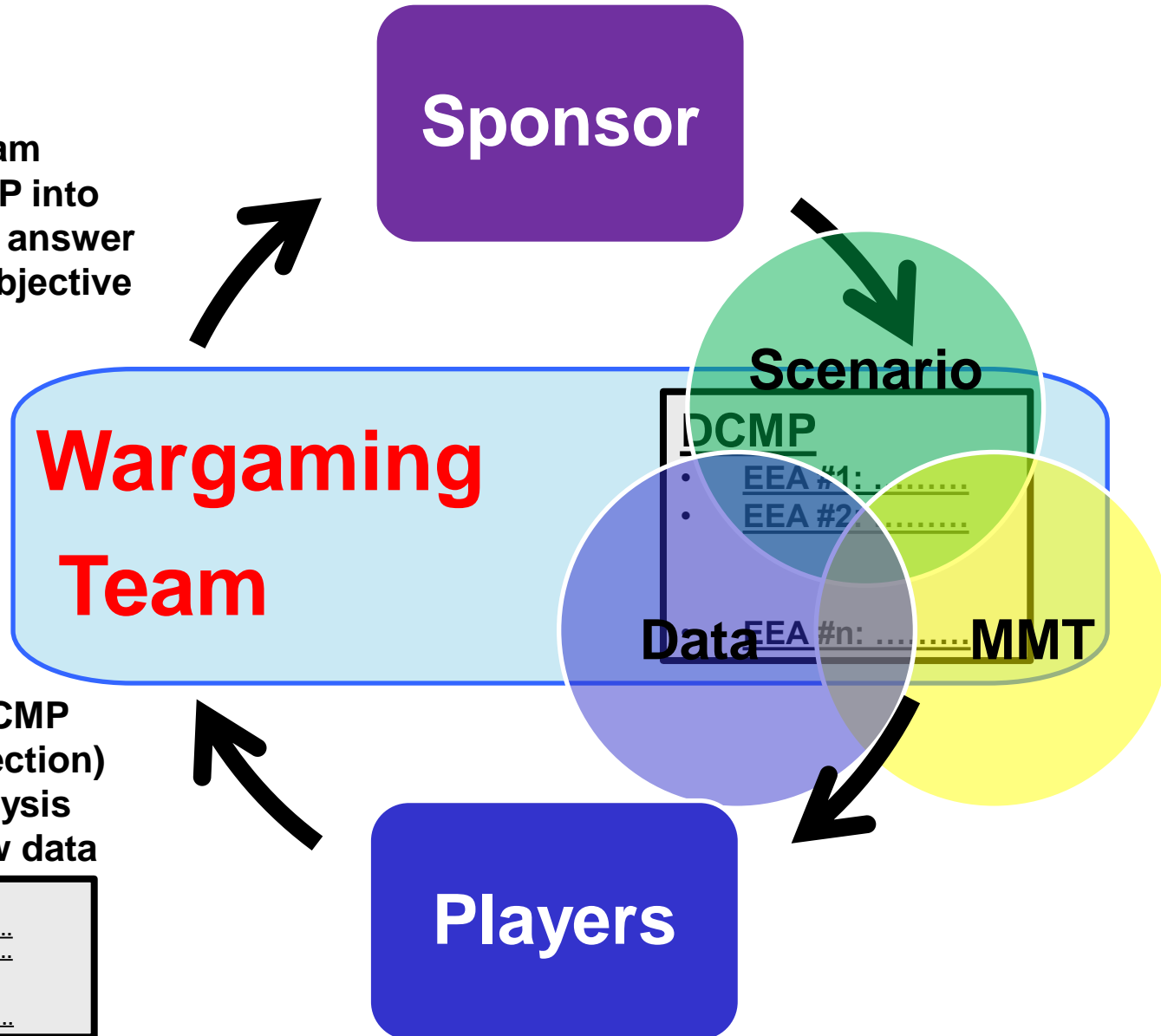
Completed DCMP (via data collection) provides Analysis Team with raw data

DCMP
- **EEA #1:** ....
- **EEA #2:** ....

- **EEA #n:** ....

Players

Methods, Models, & Tools (MMT) Purpose

- **THE wargame mechanisms that cause the actions and interactions required for the sponsor's objectives and issues to be answered!**

- ***Adjudicate*** **the outcome(s) of player decisions in order to provide feedback:**

    - **Combat outcomes**

    - **Opponent responses**

- **Provide bounds on the physical capabilities of combat systems:**

    - **Speed**

    - **Range**

    - **Information**

    - **Sustainability**

- **The MMT are tailored to the <u>scenario</u>, and will require <u>data</u>.**

MMTs do not have to be computer simulations!
- *__It could be a panel of SMEs.__*
- *__It might be simple look up tables or a spreadsheet tool.__*
- *__It may be the facilitator (in a pure seminar game)__*
Bottom line: MMTs need to keep the game moving by providing relevant information.

Tools from "Problem Structuring Methods"

- Peter Checkland's "Rich Pictures"

- Influence Diagrams

- Multiple Cause Diagrams, a.k.a. Causal Loop Diagrams

- Extensions:
  - Feedback Loops
  - Sign Graphs

- Further Extensions:
  - System Dynamics modeling
  - Other forms of models and simulations

- Find support in "Soft OR Tools" aka "Problem Structuring Methods":
  http://www.opanalytics.ca/npscourse/Softtools.html

Rich Pictures

- Use at the "pre-analysis stage"
  - before you know clearly which parts of the situation should best be regarded as process and which as structure

- Should depict subjective elements such as character and characteristics, points of view and prejudices, spirit and human nature

- Elements:
  - Pictorial symbols
  - Keywords
  - Cartoons
  - Sketches
  - Symbols
  - Title

- Avoid thinking in *systems terms* (to come later)

Influence Diagrams

- Represent the main structural features of a situation and the important relationships that exist among them

- Elements:
  - Blobs of varying sizes
  - Assorted arrows
  - Words labelling blobs and possibly also labelling arrows
  - Key for arrows
  - Title

- Arrows *do not* indicate flows of material, or a chronological ordering... Just *influence*

- May need coding (color, line types) to distinguish forms or strengths of influence
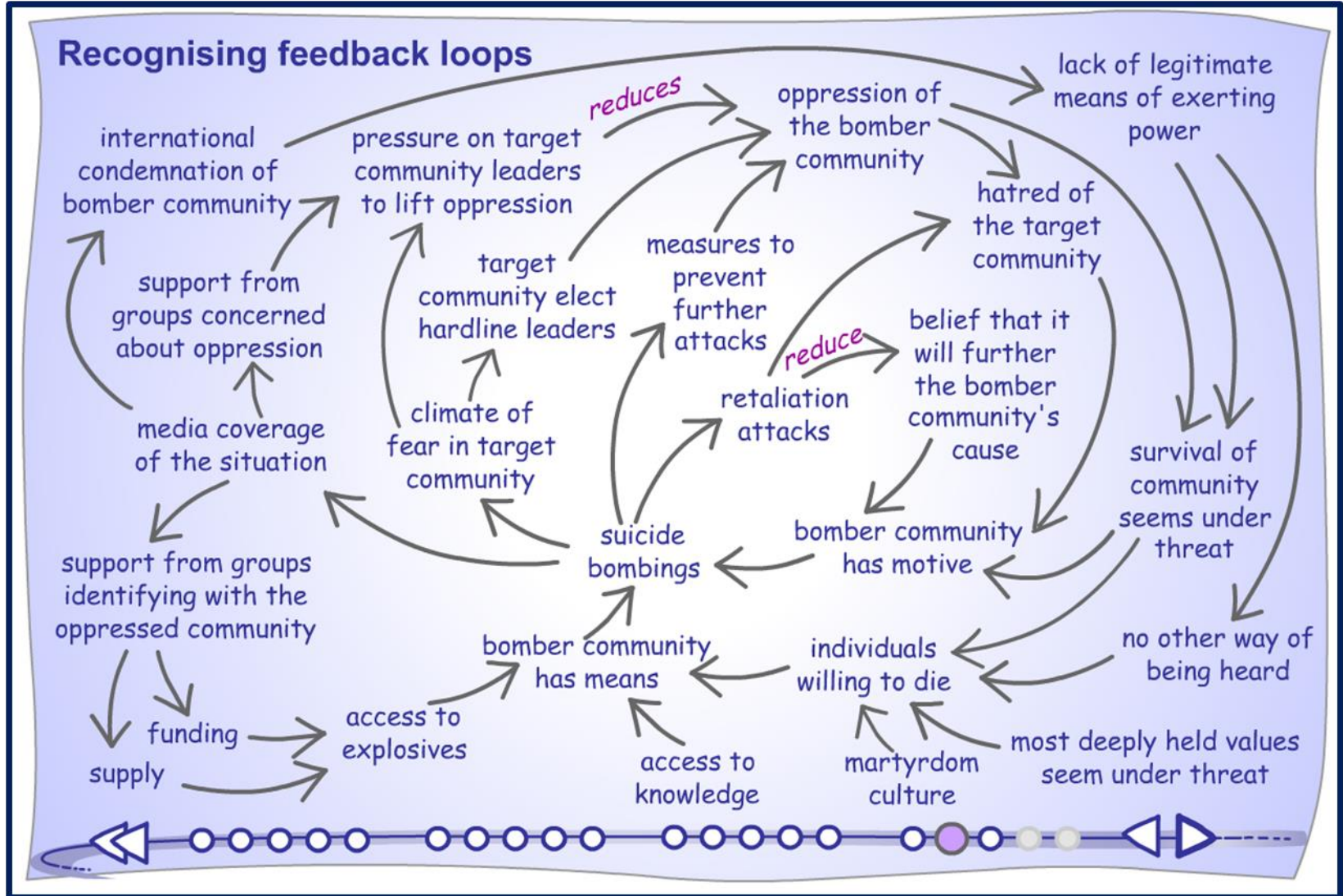
Multiple Cause Diagrams

- May be called "Causal Loop Diagrams"

- Explore why a given event happened or why a certain class of events tends to occur

- Elements:
  - System boundary (optional)
  - Phrases
  - Arrows (which may occasionally be labelled)
  - Title

- Begin at the factor/event to be explained and work backwards
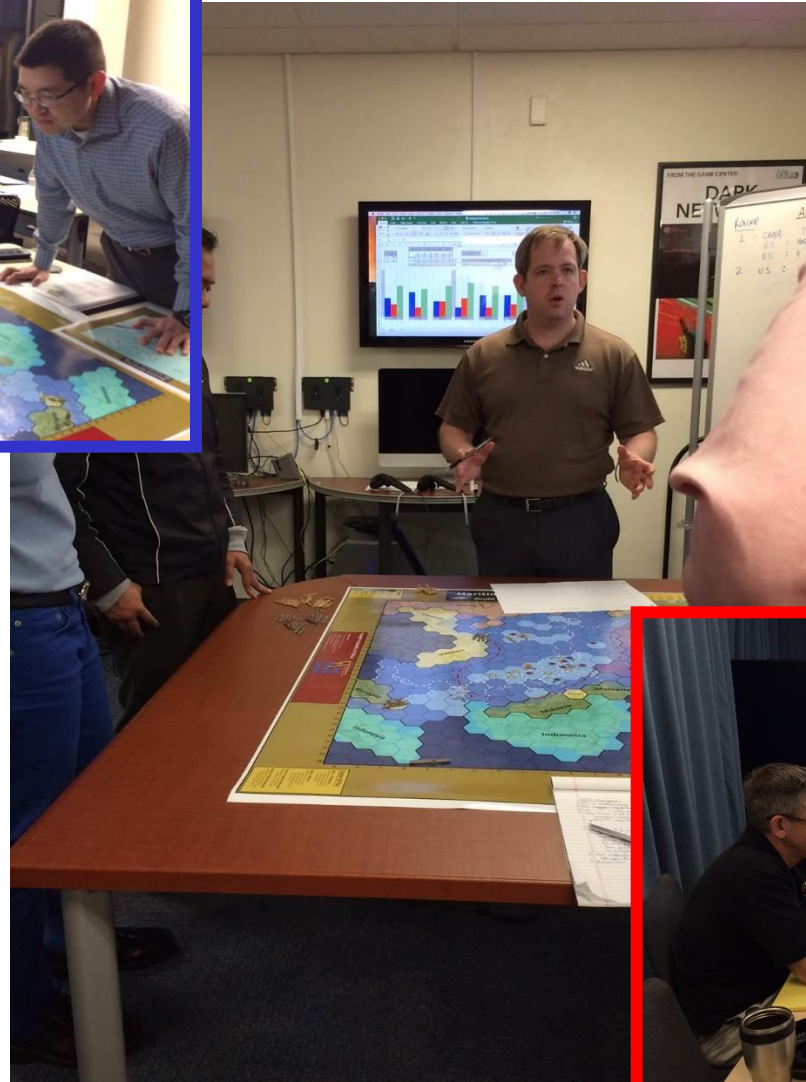
Open University Course Material
Copacetic Example

Recognising feedback loops

(Diagram of feedback loops including: international condemnation of bomber community, pressure on target community leaders to lift oppression, reduces, oppression of the bomber community, lack of legitimate means of exerting power, support from groups concerned about oppression, target community elect hardline leaders, measures to prevent further attacks, hatred of the target community, belief that it will further the bomber community's cause, reduce, media coverage of the situation, climate of fear in target community, retaliation attacks, survival of community seems under threat, support from groups identifying with the oppressed community, suicide bombings, bomber community has motive, no other way of being heard, bomber community has means, individuals willing to die, funding supply, access to explosives, access to knowledge, martyrdom culture, most deeply held values seem under threat)

From: http://systems.open.ac.uk/materials/T552/

accessed 25 October 2016

Operational Energy Wargame
System Wargame

High North/Russian Hybrid Threat
Seminar Game

Questions/comments/concerns?