

Modelling & Simulation: Issues, Challenges and Recurring Errors

MSG-108 Workshop
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Presentation Purpose

To present issues, challenges and recurring errors made when designing and delivering simulation-based training and analytical events

Agenda

- Definitions
- Distinctions
- Design
- Delivery

Agenda

- (The lack of agreed) Definitions
- (Loose) Distinctions
- (Poor) Design
- (Bad) Delivery

Definitions

Scenario:

‘The background story that describes the historical, political, military, economic, cultural, humanitarian and legal events and circumstances that have led to the specific current exercise crisis or conflict. The scenario is designed to support exercise and training objectives and, like the setting, can be real, fictionalised or synthetic as is appropriate. A scenario will be composed of specific modules, event and inject serials and technical data essential to the accomplishment of the exercise objectives or of the seminar/academic/experiment objectives.’

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Definitions

Wargame:

NATO AAP-6:

'A simulation, by whatever means, of a military operation involving two or more opposing forces, using rules, data, and procedures designed to depict an actual or assumed real life situation.'

Definitions

Wargame:

Working UK DCDC:

‘Adversarial by nature, wargaming is a representation of military activities, using rules, data, and procedures, not involving actual military forces, and in which the flow of events is affected by, and in turn affects, decisions made during the course of those events by players acting for all actors, factions, factors and frictions relevant to those military activities.’

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The Power of Wargames

- Better decision makers and decision making
- An opportunity to:
 - identify and mitigate risks in a risk-free environment
 - practise key skills in a joint, combined and interagency context
 - reveal unintended consequences
 - test assumptions
- Exposure to:
 - the full spectrum of conflict at all levels, current and future
 - the friction inherent in all military operations
 - an adaptive thinking opponent
- A mechanism for:
 - exploring innovation in the art of war
 - experimentation and exploring 'what if' questions
 - developing and refining force structures and operational modus operandi
- Players facing the consequences of a their own decisions
- An enjoyable, challenging and engaging environment

Distinctions

Simulation:

- **Live.** Real people using real systems. For example soldiers using laser emitters and receivers to simulate fires, or real aircraft fitted with emitters and sensors.
- **Virtual.** Real people using simulated systems. For example a tank crew in a simulated tank operating in a virtual environment.
- **Constructive.** Simulated people using simulated systems. For example a HQ giving orders to simulated subordinate forces based on a simulated operational picture. a operational picture.

Distinctions

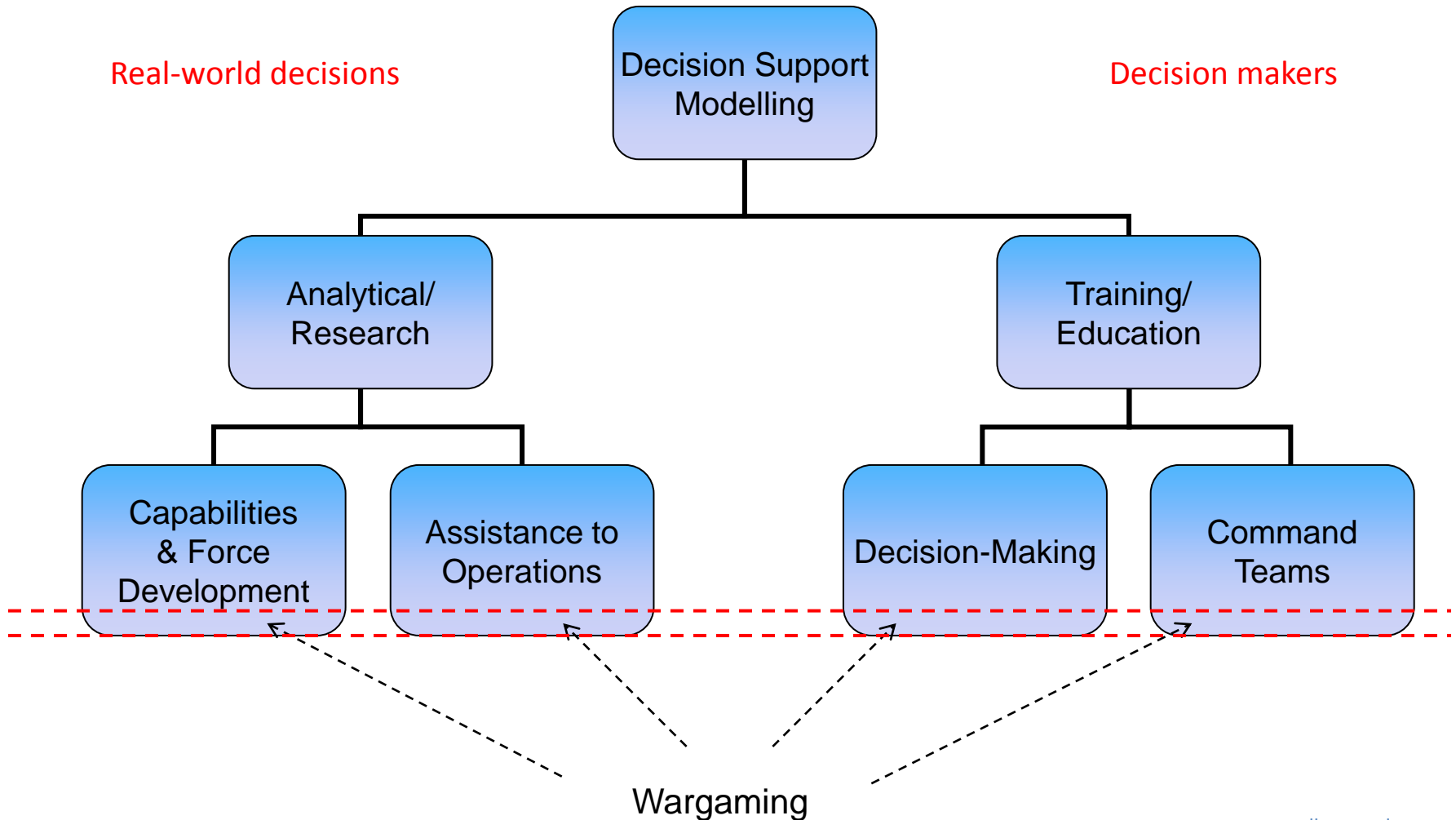
Training versus education

‘A’ War versus ‘The’ War

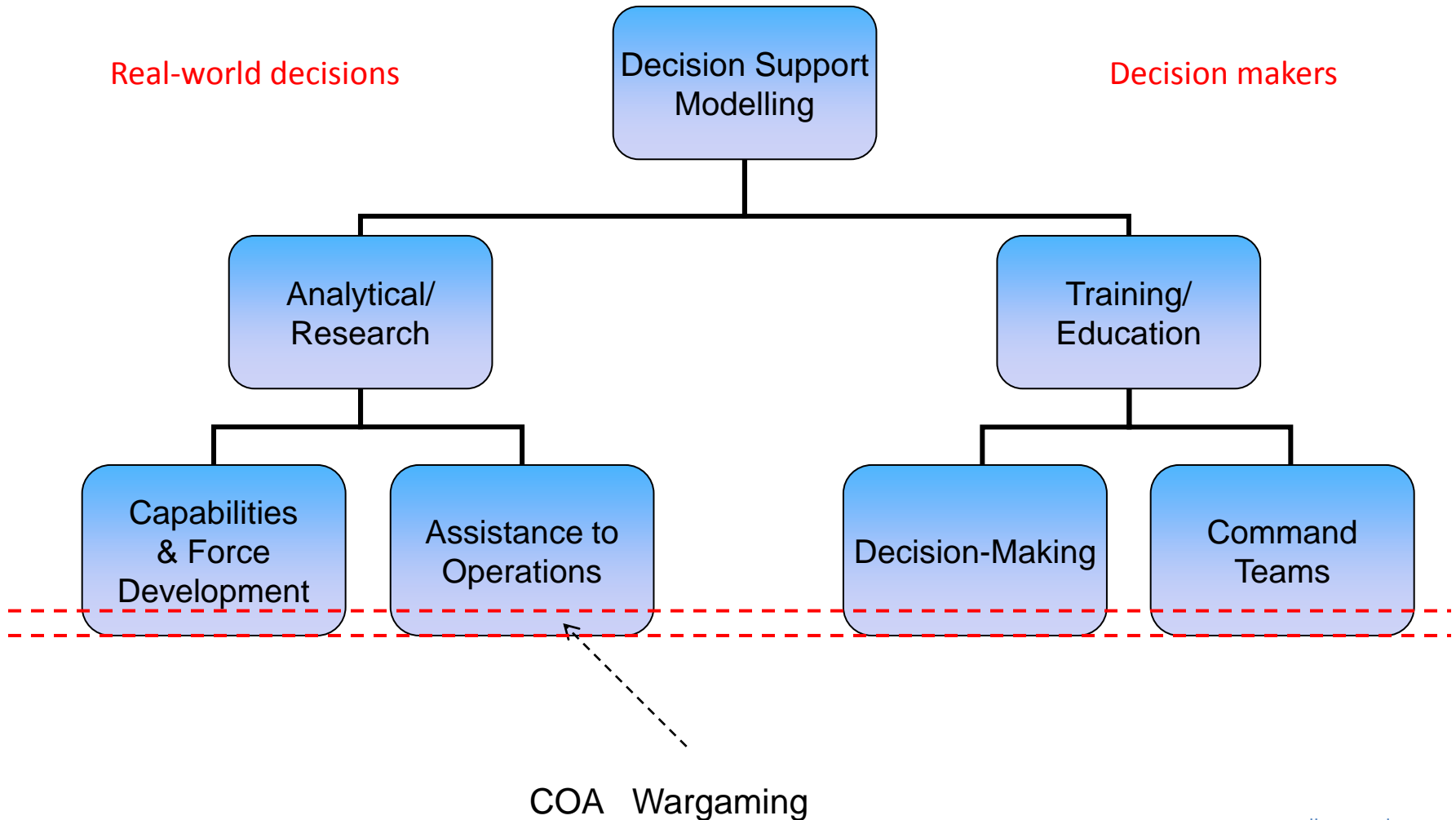
Validation versus verification

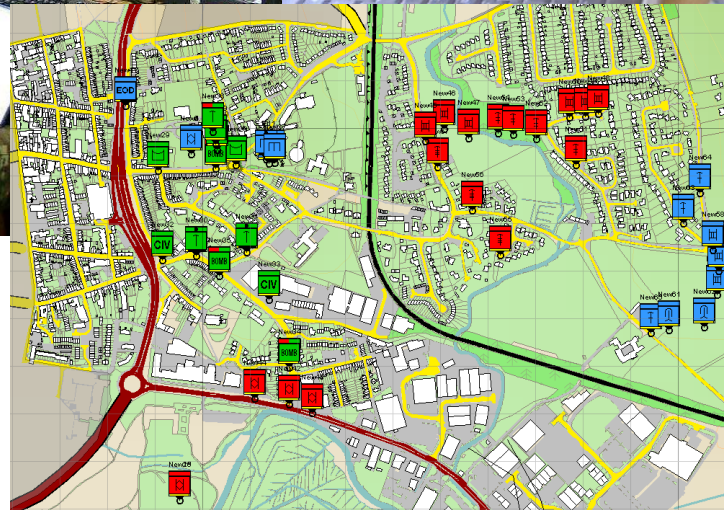
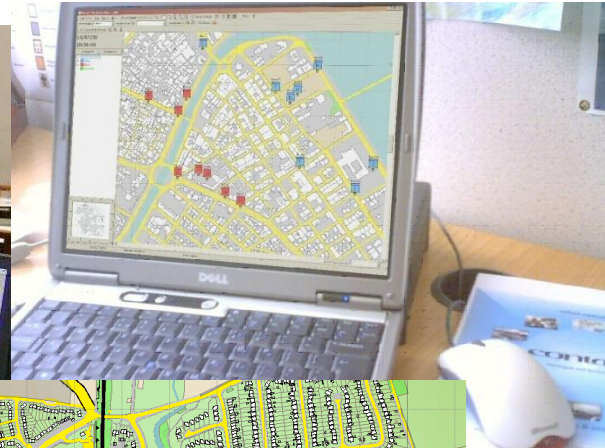
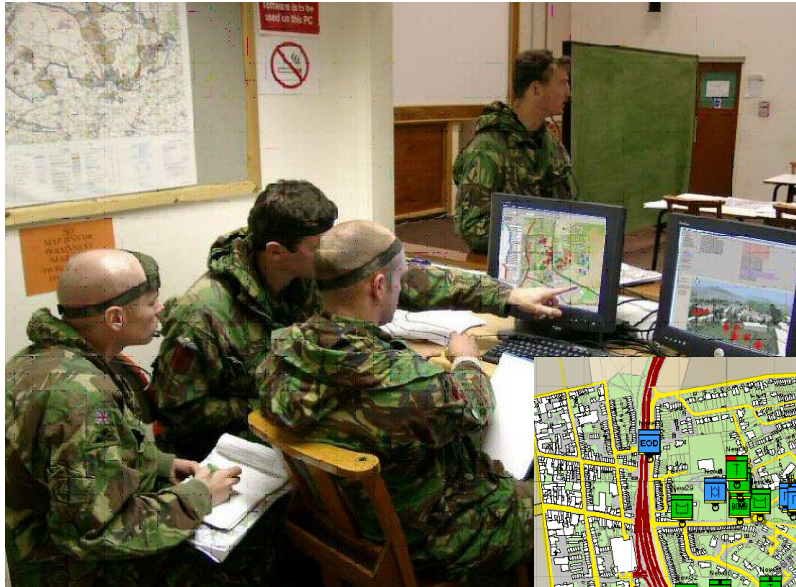
Types of Wargame

Distinctions



Distinctions





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Design

The Design Process for a **training** wargame:

1. Specify the wargame Aim and **Training Objectives**
2. Identify the **people** to be trained, their roles and the decisions they will be expected to make
3. Determine the **effects on the players** that are desired, and the exercise activities required to achieve these
4. Determine the **scenario** and the **types, level and sources of all information** the players will need to make their decisions and to enable the desired effects to be visited on them
5. Identify the **processes** required to enable the outcomes of Steps 3 & 4
6. Identify the **tools, technology and SMEs** needed to make the exercise elements and processes work
7. Create an audit trail by documenting all decisions taken and the reasons for them

Design

The Design Process for a research wargame:

1. Specify the aim (to include the overall **Research Question**) and objectives
2. Identify the **subject(s) of the analysis**, and any critical elements within these
3. Determine how the subjects of analysis will be **evaluated**, any **required scenario** and any variables that will be required to achieve this
4. **Identify the metrics** that will need to be gathered to measure and gauge this evaluation, and how this data capture will be done
5. Identify the people required to **ensure the validity** of the analysis
6. List any **assumptions** made to date
7. Identify the **processes** required to achieve the objectives
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Design

It's the **process**, stupid:

‘The successful conduct of a CAX depends more on the correct composition of exercise components (Ex Control, Ex Support and Training Audience) than on the efficient tackling of technical issues’.

Erdal Çayirci. ‘Computer Assisted Exercises: A Reference Guide’, p.16

Design

The Design Team:

‘It is important to make one thing clear at the very start; designing a wargame is an art, not a science. Experienced **military officers, practiced operations research analysts, and accomplished computer programmers are not necessarily capable of designing useful wargames.** Although some or all of the knowledge and skills for such people are important tools for a wargame designer to possess, the nature of game design requires a **unique blending of talents**’.

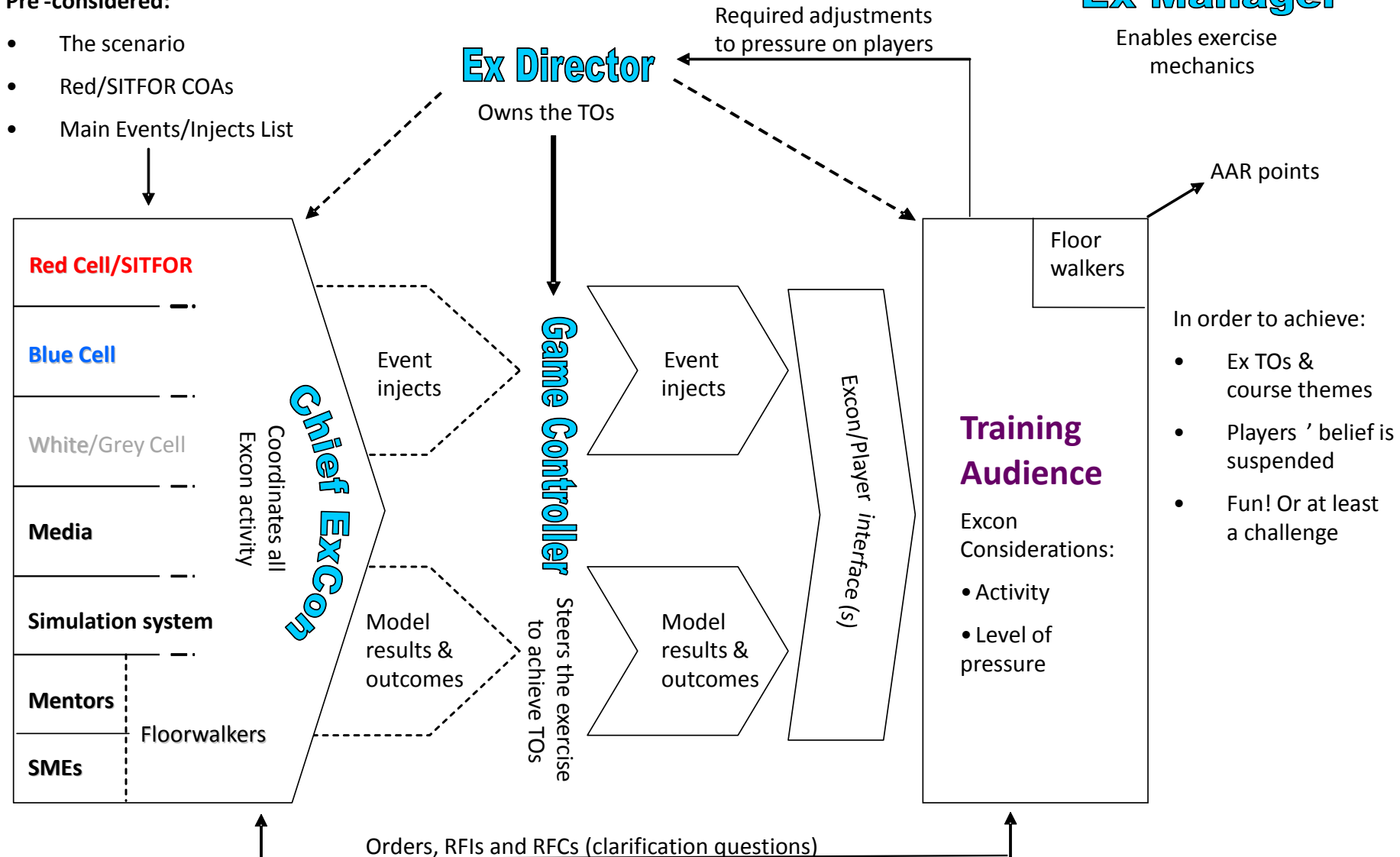
Perla, P. *The Art of Wargaming*, Naval Institute Press, 1990.

1. Military officers
2. Operational Analysts/Researchers
3. Software/technical experts
4. Wargame designer

Delivery

Pre -considered:

- The scenario
- Red/SITFOR COAs
- Main Events/Injects List



Delivery



Delivery

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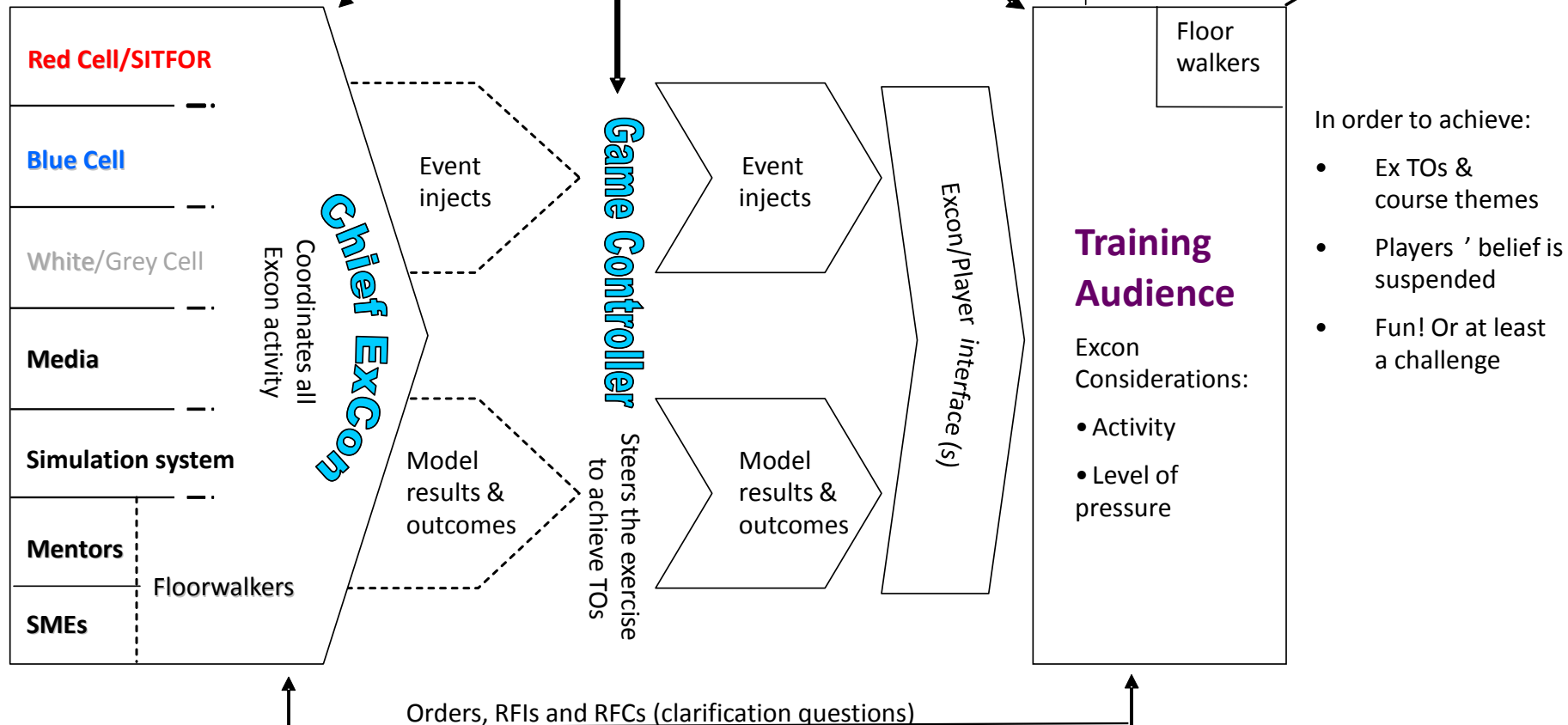
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Ex Director

Owens the TOs

Ex Manager

Enables exercise mechanics



Conclusions

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Questions?