Interruption Interview:

An approach to elicit situation assessment for an ill-defined task

Presented at
15th International Command & Control Research & Technology Symposium

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INTERRUPTION INTERVIEW

An interviewing technique where participants are interrupted in a simulated environment for the purpose of understanding how one

- comprehends percepts in the environment and
- projects these percepts into the future.

Influenced by

- Klein's approach to Naturalistic Decision-Making (cognitive dimensions)
- Endsley's theory of Situation Awareness (projection into the future)

MOTIVATION

“故曰 知己知彼，百战百胜，
不知己而知彼，一胜一负，
不知彼不知己，每战必败。”

~ Art of War by Sun Tsu, around 500BC

“If you know the enemy and know yourself,
you need not fear the result of a hundred battles.”

~ Translation by Giles (1910)

OBJECTIVES

Project: Elicit cognitive processes related to assessing an intelligent adversary

- Types of predictions & relation to performance
- Basis of judgment
- Situational considerations
- Order of recursion

Paper: Methodology

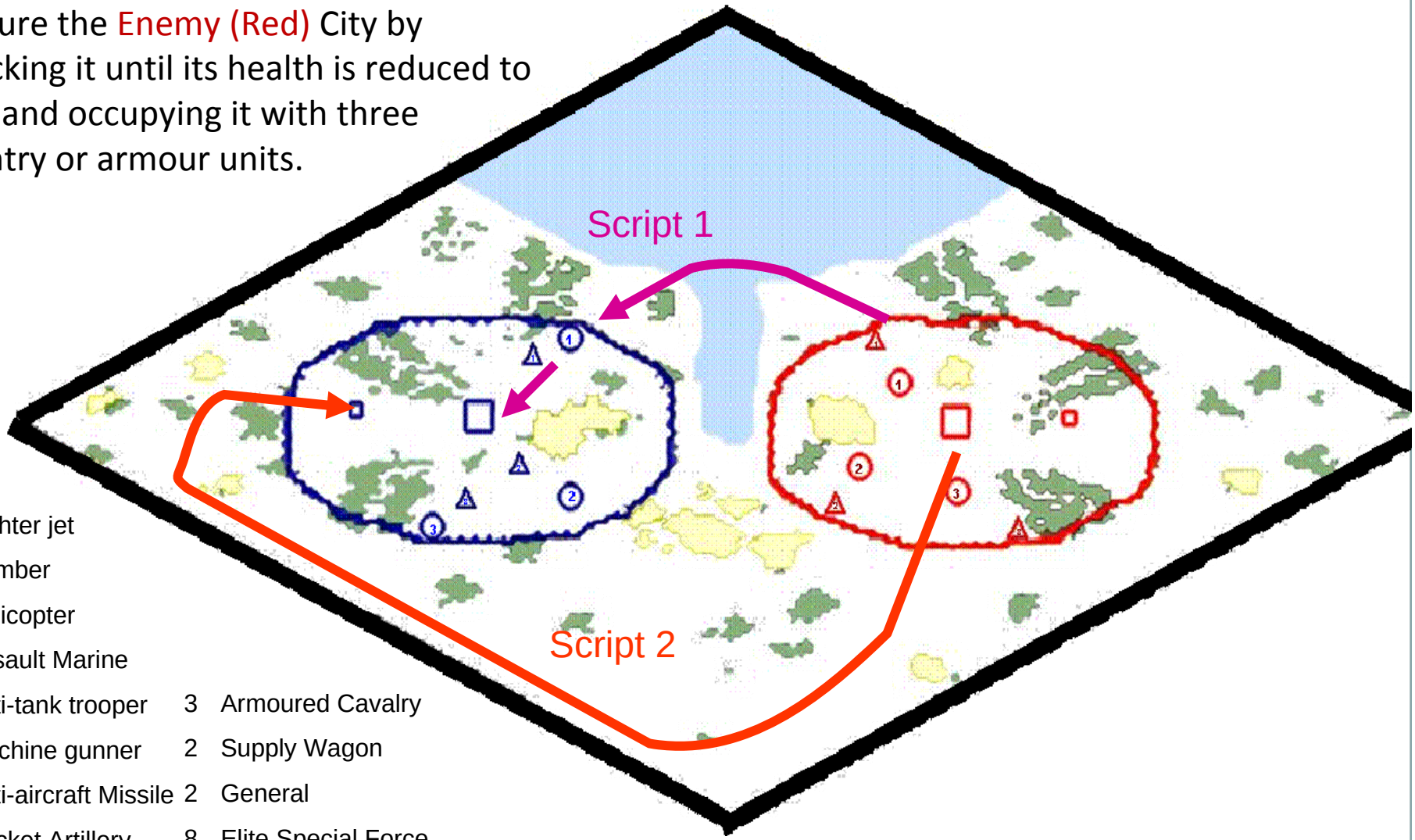
- Design
- Execution
- Challenges
- Demonstrate its effectiveness

ENVIRONMENT

	Warfighting	Simulation
Uncertain	Yes	Yes
Dynamic	Yes	Yes
Time Pressure	Yes	Yes
Limited resources	Yes	Yes
Stake	High	Limited

Modified COTS
Microsoft Rise of Nations
•2 sided
•Participants had limited resources.

Capture the Enemy (Red) City by attacking it until its health is reduced to zero and occupying it with three infantry or armour units.



5	Fighter jet		
4	Bomber		
3	Helicopter		
4	Assault Marine		
3	Anti-tank trooper	3	Armoured Cavalry
2	Machine gunner	2	Supply Wagon
5	Anti-aircraft Missile	2	General
3	Rocket Artillery	8	Elite Special Force
4	Main Battle Tank	5	Spy

Effectiveness of Tools: Does prediction performance affects task performance?

- 10 Participants x 4 Interruption Interviews
- 463 Predictions

	Participant level	Trial level
Prediction frequency correlates with game performance	(r(8) = .691, p=.027)	(r(38) = .318, p=.045)
Prediction accuracy does NOT correlates with game performance	(r(8) = .074, p=.840)	(r(38) = -.127, p=.434)

One does not have to be accurate in his prediction but he should make as many predictions about the enemy as possible!

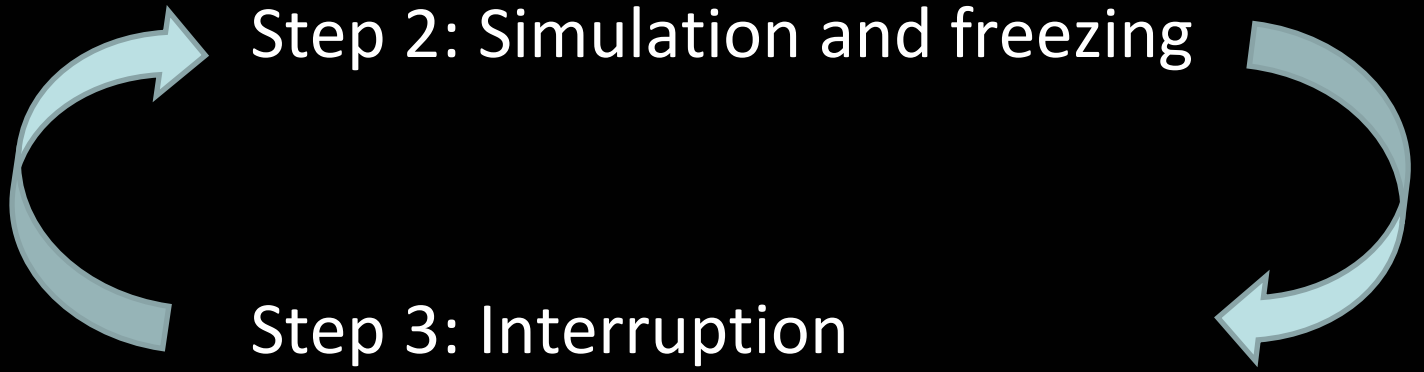
INTERRUPTION INTERVIEW

OVERVIEW

Step 0: Preparation

Step 1: Pre-task planning

Step 2: Simulation and freezing



Step 3: Interruption

Step 4: Post-task comprehension

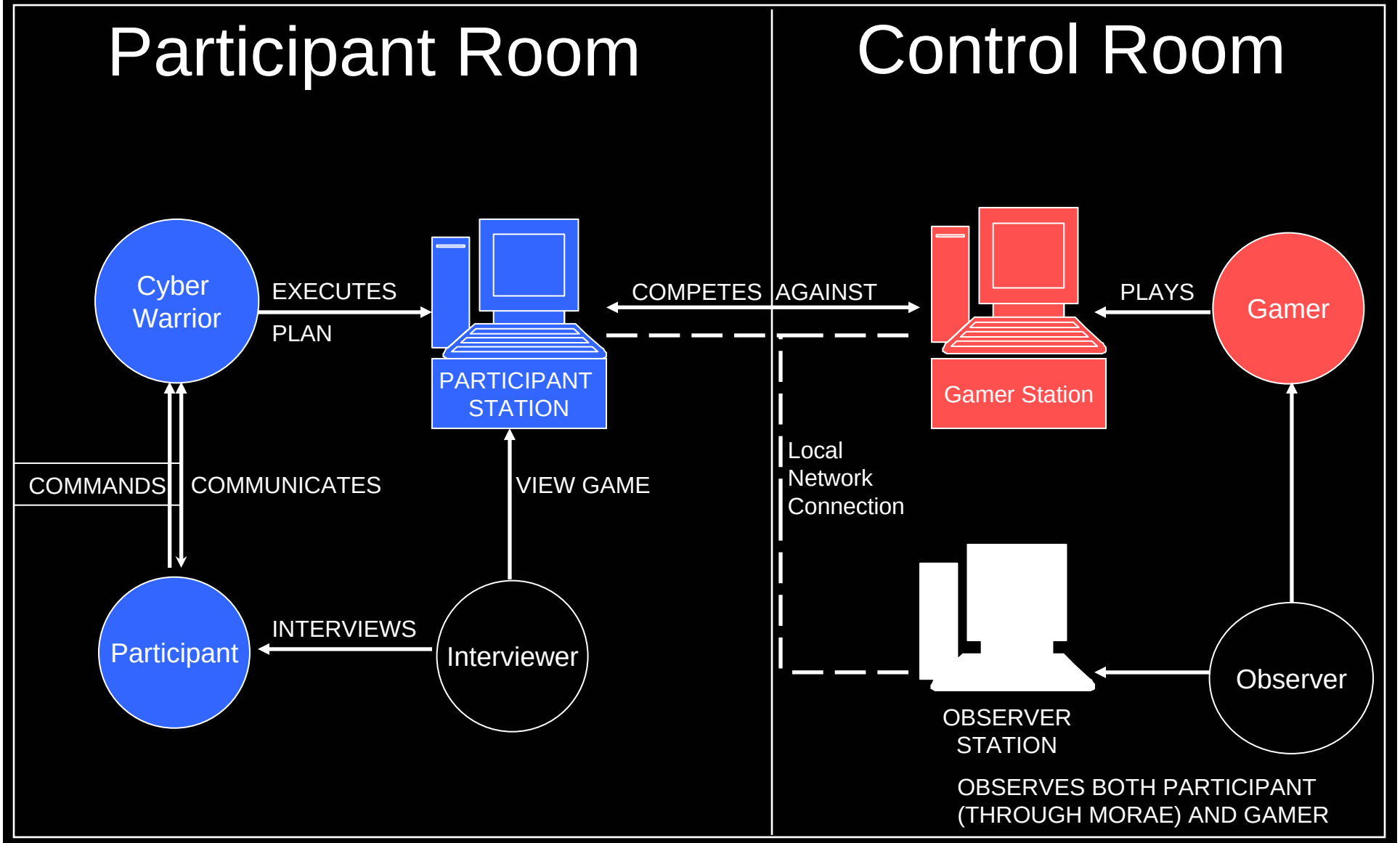
STEP 0: PREPARATION

Experiment Design

Coordination

Coordination

ENVIRONMENT



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STEP 1: PRE-TASK PLANNING

People are not thrust into complex and ill-defined tasks without warning!

PLAN & PREDICT

Interview

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STEP 2: SIMULATION & FREEZING

rticipants

mi-inform: Aware of freeze
d interview but not aware of
e ground rules

actice trial:

Different scenario

ess interviews

Experimenters

Semi-structured ground rules

- Calling and ending interruption
- Interval ~ 5min
- Not freezing during intense actions
- Signature question at the end of the interview

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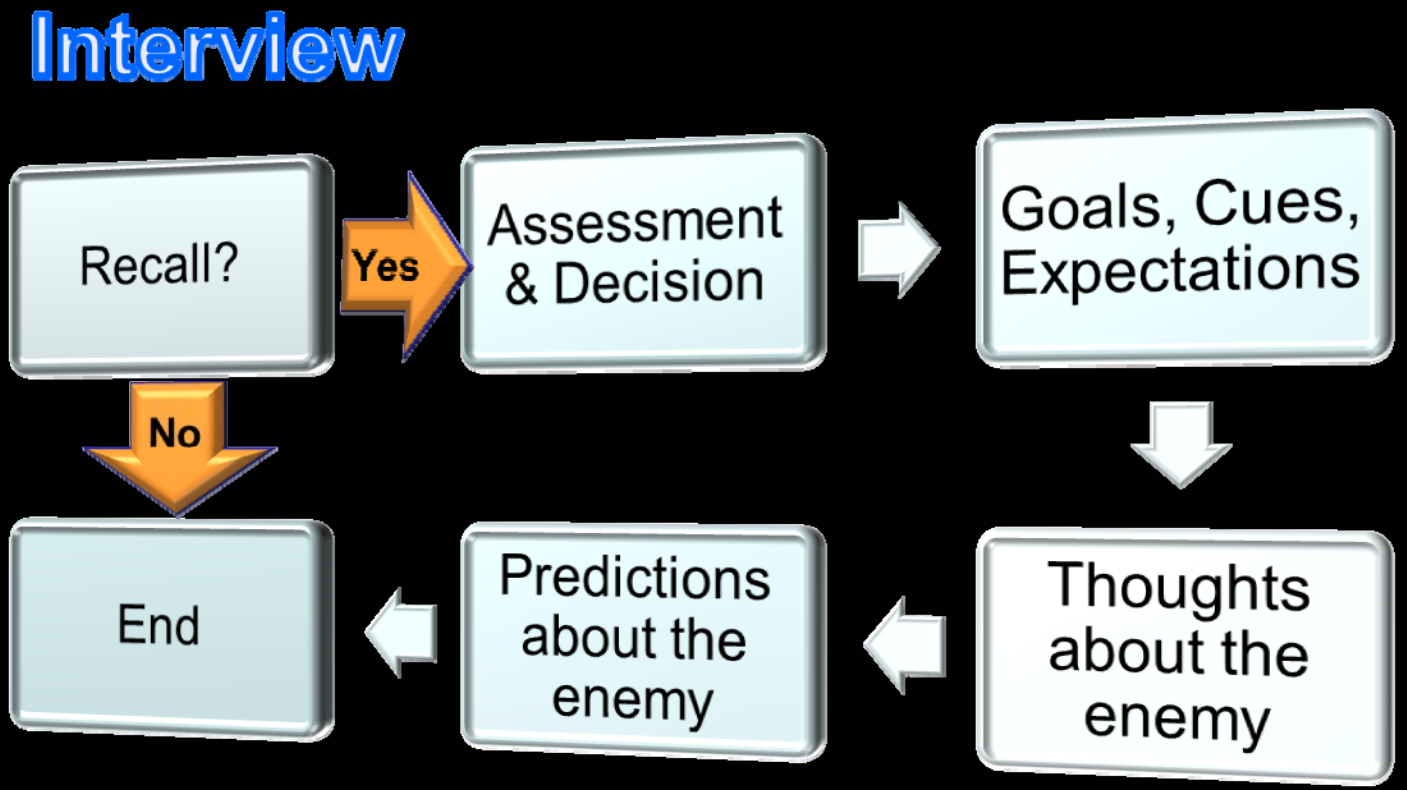
STEP 3: INTERRUPTION

Identify the
situations
gn questions
situation.
ttributes of
.g. location,
ction, size)

record
s they unfold



STEP 4: POST-TASK COMPREHENSION

Comprehension

Predictions for next game

Debrief: Summary of events

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RESULTS

EFFECT OF INTERRUPTION INTERVIEW

Participants felt that the interview gave them extra time to think about the problems.

However, results indicate no significant difference, $t(9) = .843$.

	Mean	SD
With Interruption Interview	8986	1541
Without Interruption Interview	9125	1554

Even if there is an effect, we were not too concern as the study was meant to be **exploratory**.

There were many other confounding variables. Examples:

-Pace of the battle

-Fatigue

-Stress

Discussion

- Supports in-depth analysis between psychological constructs for complex and ill-defined tasks
- For exploratory studies only
- Resource-intensive
- Dependent on participant's ability to verbalise their thought

Q & A

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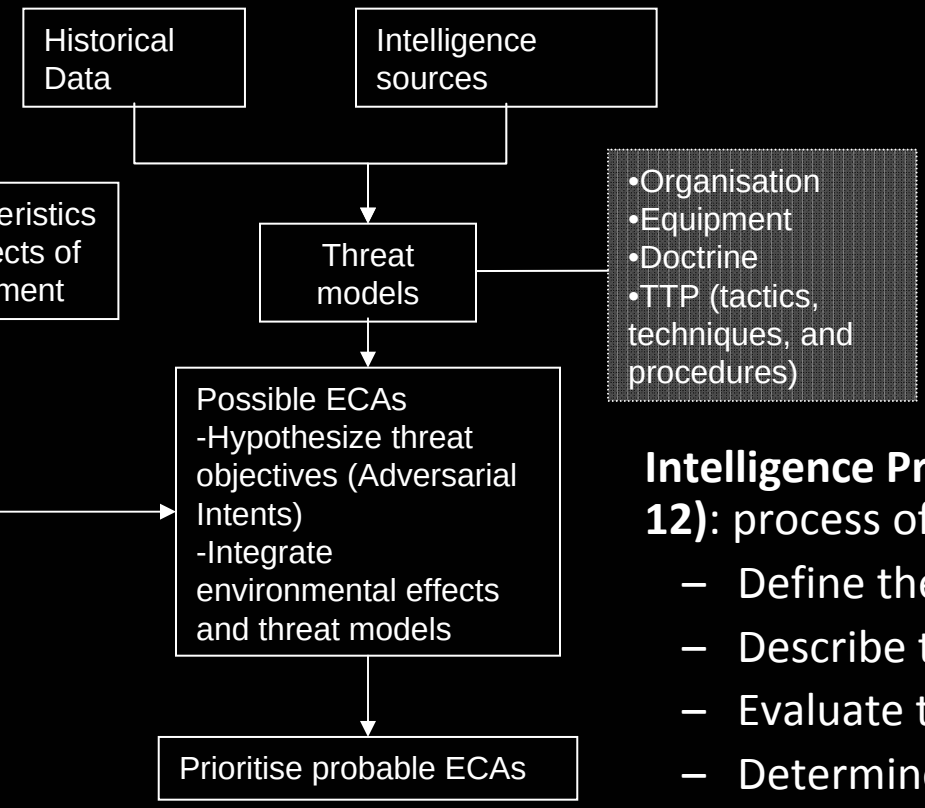
LITERATURE REVIEW (PROJECT)

MILITARY APPROACH



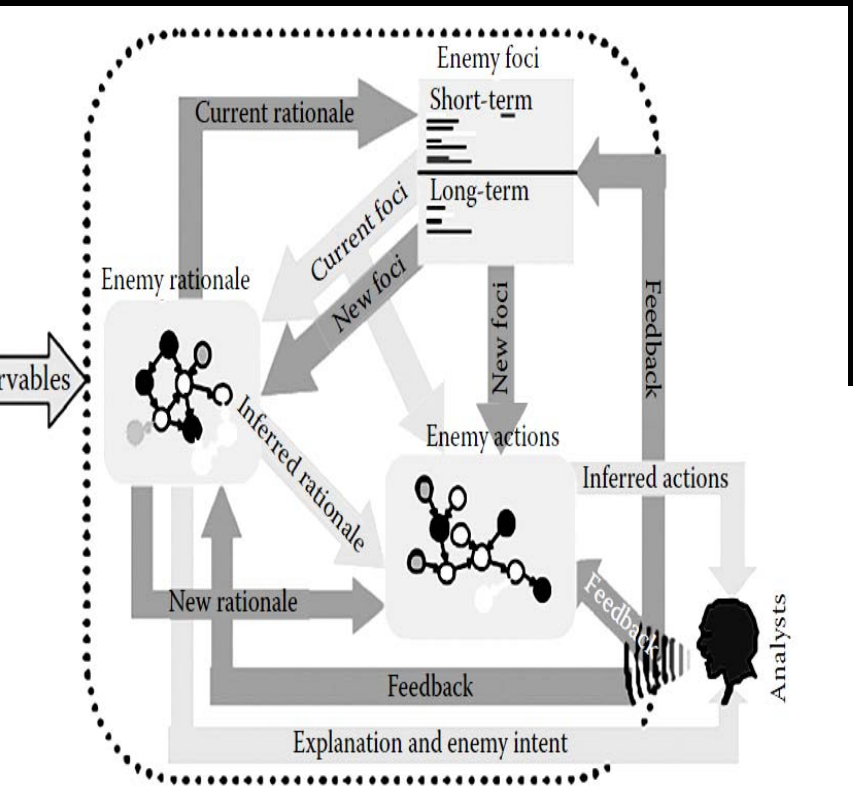
Intelligence Preparation of the Battlefield (FM100-12): process of analyzing enemy threats

- Define the battlefield environment
- Describe the battlefield's effects
- Evaluate the threat
- Determine threat course of actions

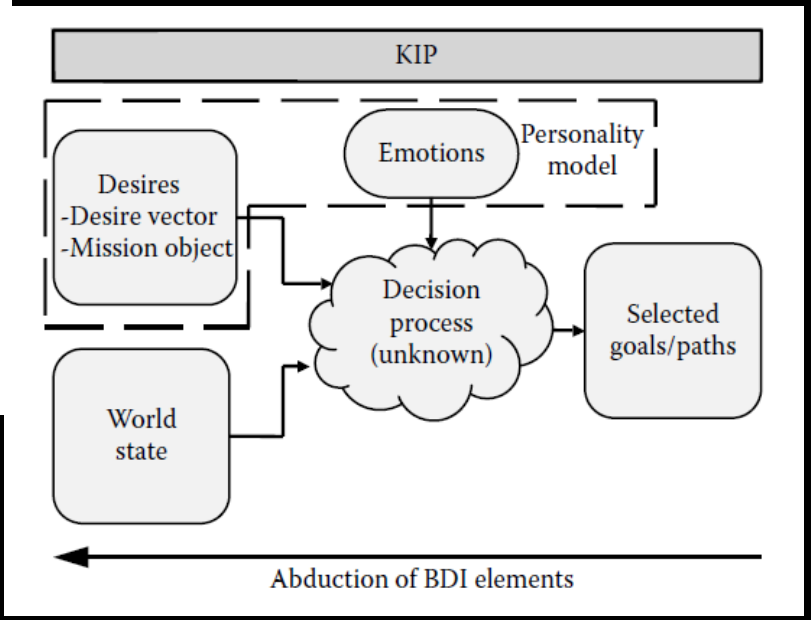
Similar to the idea of Sun Tzu's foreknowledge through intelligence gathering

COMPUTATIONAL APPROACH

- Model the adversarial belief
- Incorporate dynamics & effects of the environment
- Generate possible goals and intents
- Compute most probable intent



Intent Inferencing Process (Santos Jr
007, p12)



BDI model structure of KIP (Nielsen, Crossman, and Jones, 2007, p.33)

7 PRINCIPLES OF ADVERSARIAL THINKING

1. Construct a model of opponent, O, based on past behaviours
2. Include O's model of own (proponent, P) model
3. Use O's model to infer O's plan and add to O's model
4. Use this model to infer likely actions and responses to P's actions
5. Combine P's model, O's model, and environment to make a decision about the best course of action
6. Use O's model to predict what O will not expect
7. Take steps to conceal own plans.

(Thagard 1992)

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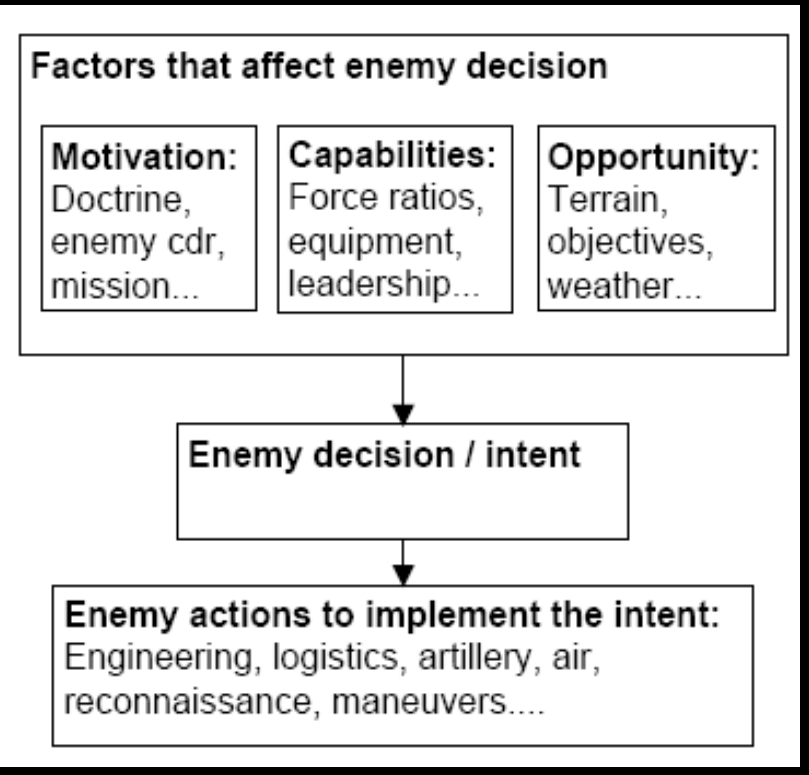
ENEMY INTENT SCHEMA



Components of enemy intent schema (Cohen, Thompson, Adelman, Bresnick, Shastri, & Riedel, 2000, p. 24)

Knowledge structure of enemy intent

- Principles and methods structures used to derive goals

Strategies used by commanders

- Proactive strategy
- Predictive strategy
- Reactive strategy