



# NOVEL AI IN WARGAMING: WHAT WOULD NAPOLEON DO WITH RED'S SHOES?

ISMOR'19

23<sup>rd</sup> July 2019

## **What are we trying to do?**

- Improve Red teaming and wargaming for operational planning and analysis by taking into account different Red perspectives - history and their learning

## **What is new in our approach?**

- We use AI from the financial sector that can be adapted to learn how Red learns
- Tries to predict how well Red might resist Blue's planned course of action (COA)
- Suggests decisions Red might make by comparing the past to the present

## **What difference could it make?**

- Informs Blue's best COAs, and whether Blue should change its CONOPS
- Helps iterate the campaign plan by testing against Red's vote
- Identifies potential risks due to Red's learning e.g. Blue's vulnerable Decisive Conditions (DCs) and Supporting Effects (SEs)
- Identifies potential opportunities e.g. when Red is vulnerable due to lack of experience, when to remove (or not) a Red commander for maximum impact

## **Next steps**

- Move from 'toy model' to proof-of-concept, automate input and output, and test

# Outline

## Background

- History
- Sparse data, explainable AI
- Team and approach

## Ideas

- The problem and solution space
- What would Napoleon do?
- Taking a walk in Red's shoes

## Challenge

- Past performance contradictions
- AI to learn Red commanders' learning cycle and spot similar situations

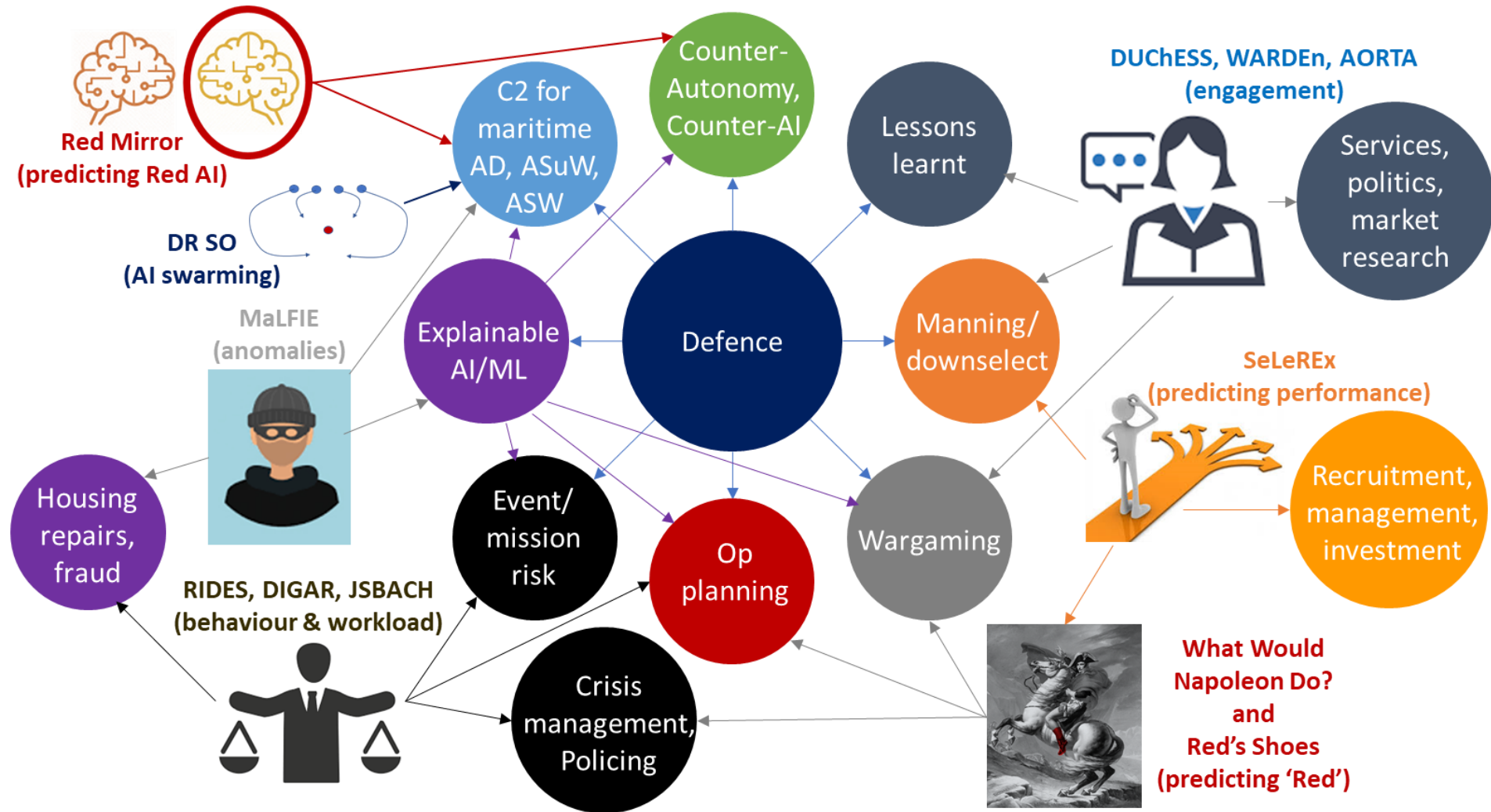
## Toy-model

- Campaign input and risk
- Red commander learning
- Past Red commander COAs
- Benefits

# Background | History

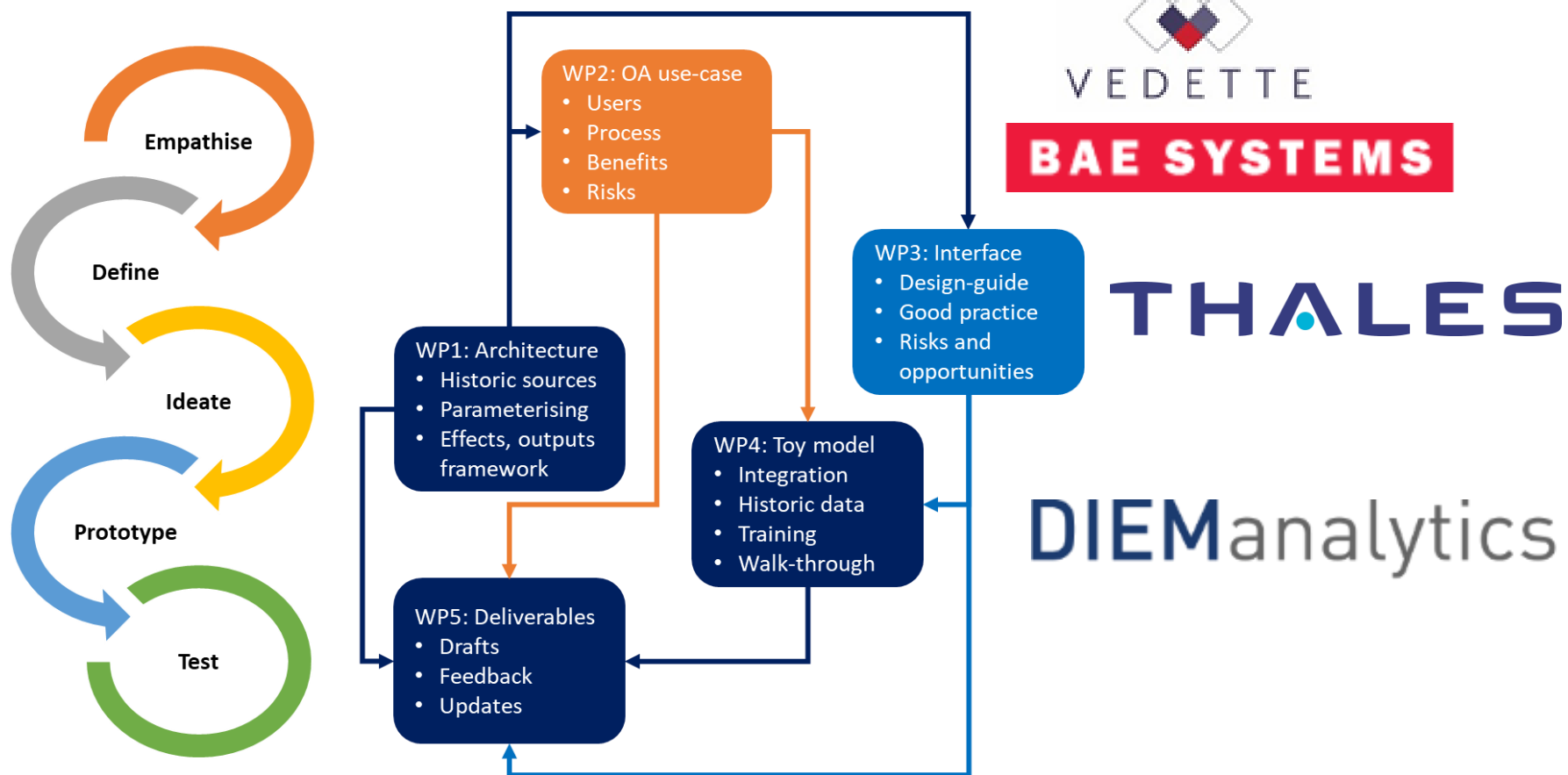


# Background | Sparse data, explainable AI



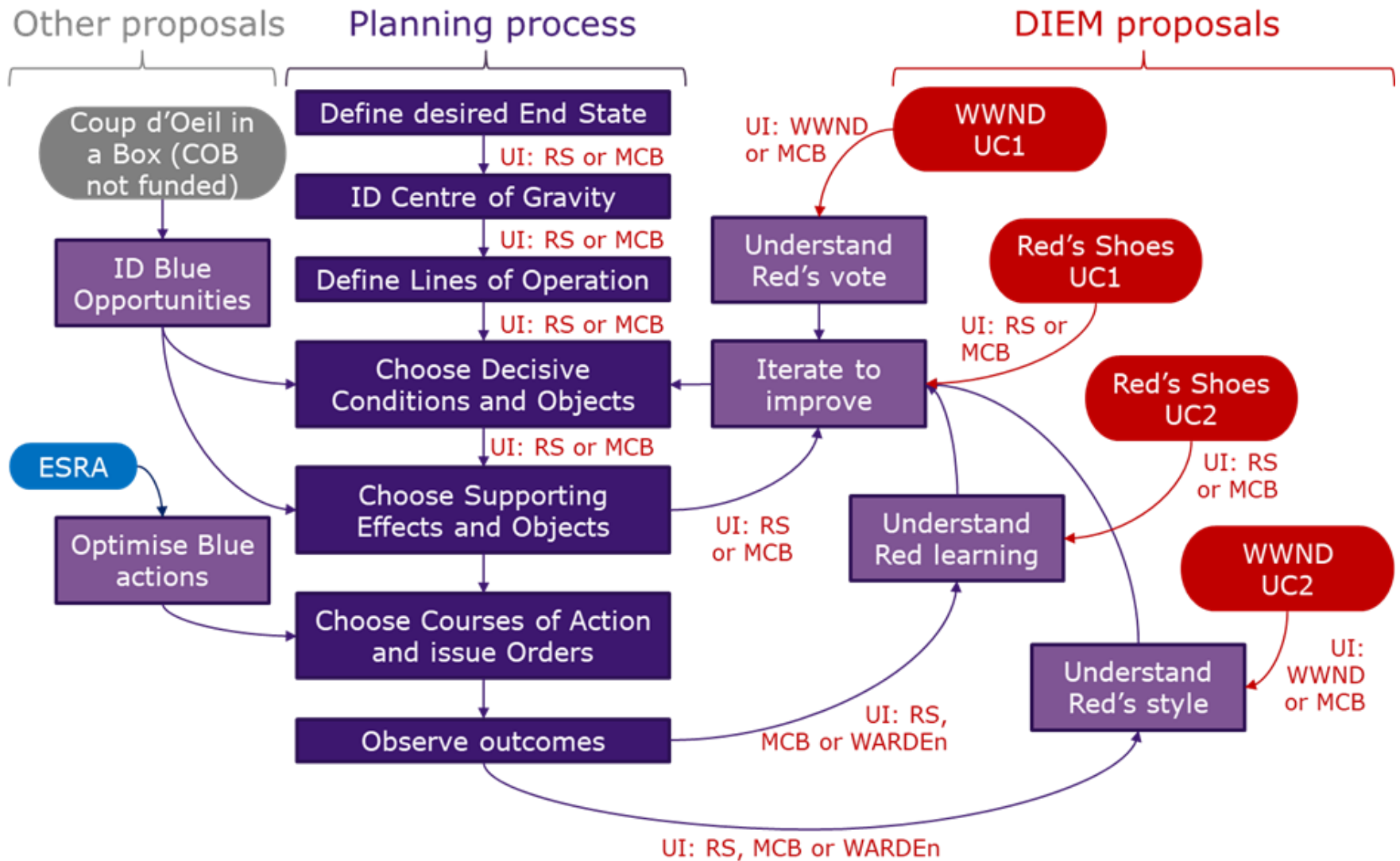
# Background | Team and approach

- 6 ideas proposed and discussed at IMMT industry day Jul'18
- Team formed from SMEs (subject matter experts)





# Ideas | The problem and solution space



# Ideas | What Would Napoleon Do?

When you are trying to

- Determine Red commanders' styles...
- Understand Red's vote...

...What Would Napoleon Do (or Zhukov, Giap, Mao, Basayev etc) provides examples of what previous commanders might have done, if they were the Red commander



*"Read over and over again the campaigns of Alexander, Hannibal, Caesar, Gustavus, Turenne, Eugene and Frederic. ... This is the only way to become a great general and master the secrets of the art of war"*

**Napoleon**



# Ideas | Taking a walk in Red's Shoes

When you are trying to

- Iterate to improve your plan...
- Understand whether to change your CONOPs

...Red's Shoes indicate the Red commander's will and skill in resisting your planned effects, based on their experience and learning



*"You must not fight too often with one enemy, or you will teach him all your art of war"*

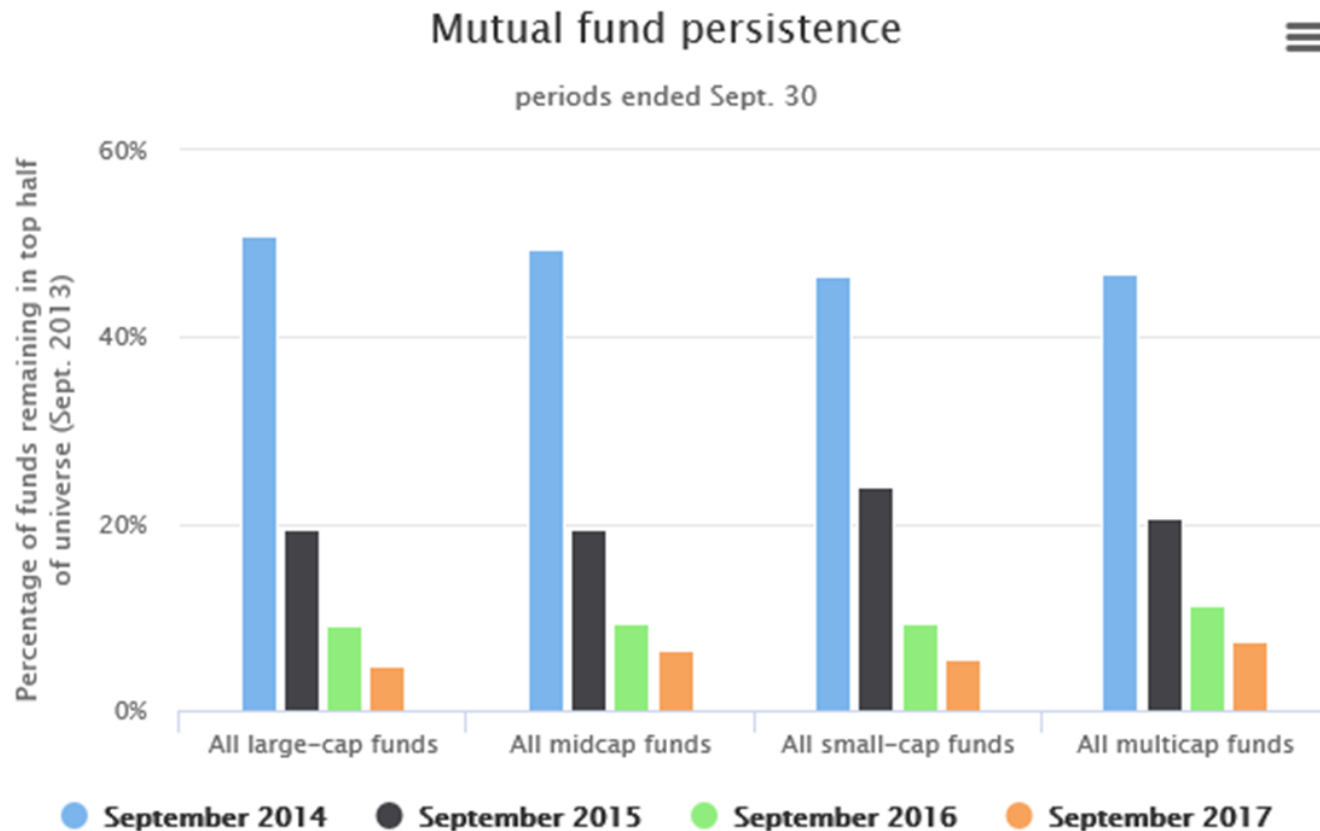
*"He that makes war without many mistakes has not made war very long"*  
**Napoleon**

*"It takes 15,000 casualties to train a major general"*  
**Ferdinand Foch**

*"What is the good of experience if you do not reflect?"*  
**Frederick the Great**

# Challenge | Past performance contradictions

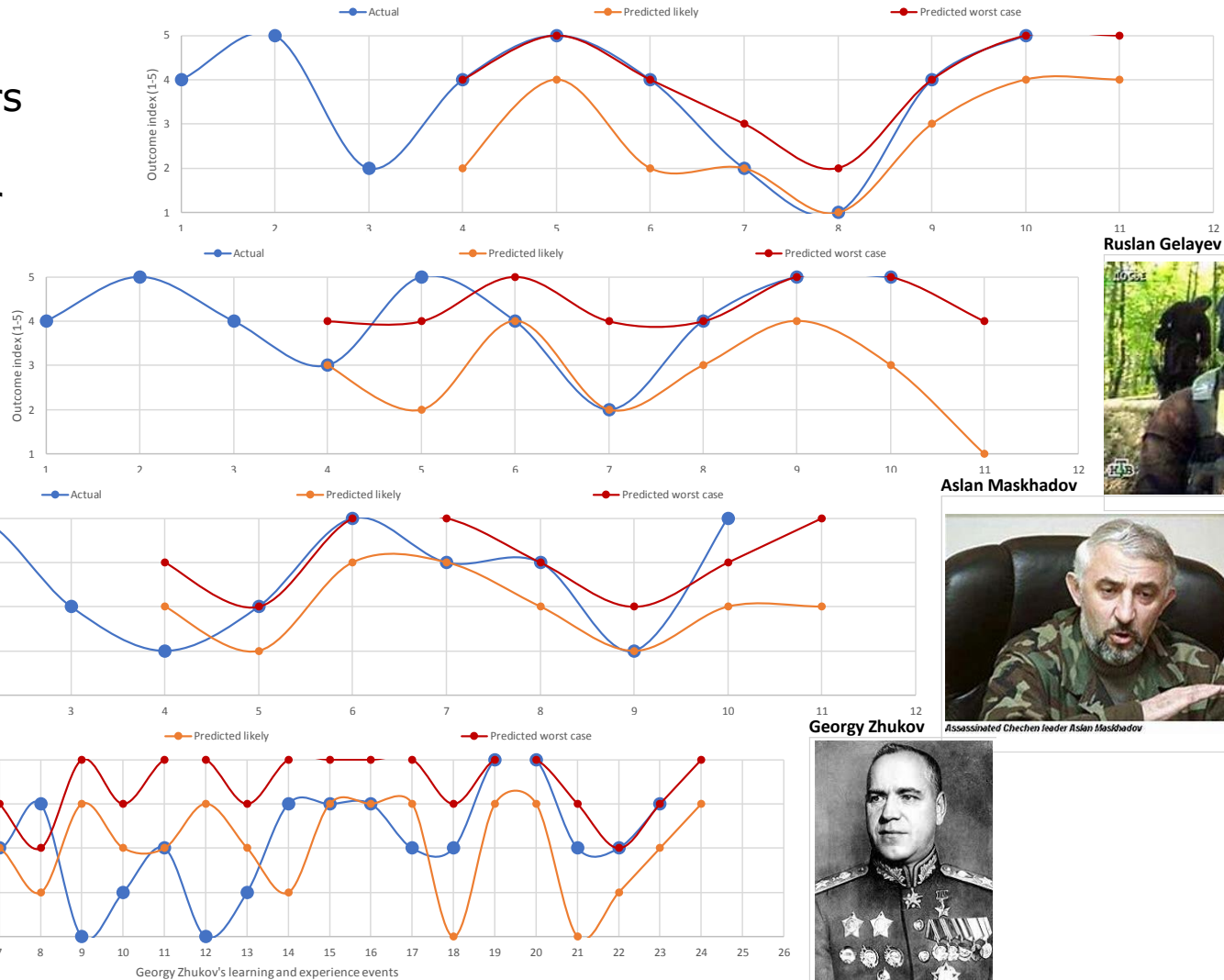
- Doing well before is no guarantee of doing well again
- Doing badly before is no guarantee of doing badly again



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# Challenge | AI to learn Red commanders' learning cycle and spot similar situations

- 3 Chechen commanders
- 1 Russian commander from WWII
- All for RS and WWND



Shamil Basayev



Ruslan Gelayev



Aslan Maskhadov



Georgy Zhukov

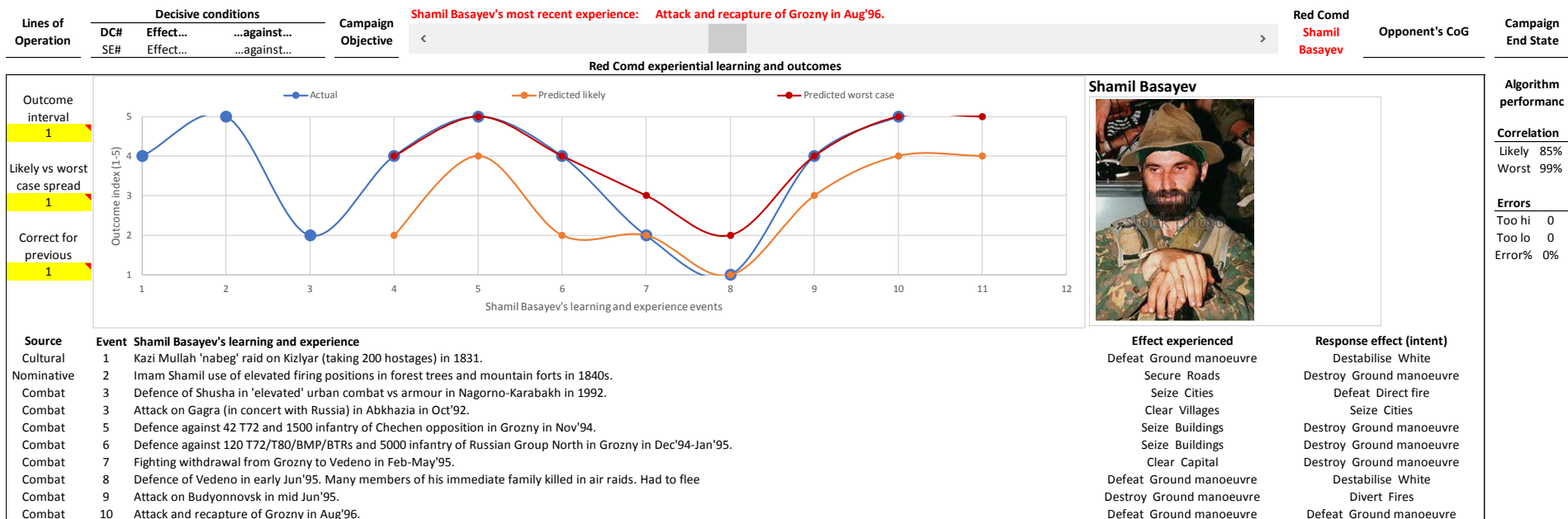


Assassinated Chechen leader Aslan Maskhadov



# Toy model | Red commander learning

- Predicts potential 'worst case' and 'likely' outcome due to the Red commander's experience for the next event
- Summarises the Red commander's previous experience event





# Toy model | Past Red commander COAs

- Capture the current situation
- Identifies and describes most similar situation faced by the specified Red commander
- Summarises what the Red commander did in this situation, and details the outcome against a range of measures

Lines of Operation	Decisive conditions			Campaign Objective	Shamil Basayev's most recent experience: Attack and recapture of Grozny in Aug'96.										Red Comd Shamil Basayev	Opponent's CoG	Campaign End State
	DC# SE#	Effect... Effect...	...against... ...against...		< >												
Situation to test Red's response in																	
Terrain		Value Plains	Weight 1	Features		Value River	Weight 1	Climate		Value Cold	Weight 1	Disposition		Value Salient	Weight 1		
Blue #Inf		Value 100000	Weight 1	Blue #Armour		Value 100	Weight 1	Blue #Arty		Value 500	Weight 1	Blue #Aircraft		Value 20	Weight 1		
Red #Inf		Value 20000	Weight 1	Red #Armour		Value 10	Weight 1	Red #Arty		Value 50	Weight 1	Red #Aircraft		Value 2	Weight 1		
Red/Blue Inf		Value 0.2	Weight 1	Red/Blue Armour		Value 0.1	Weight 1	Red/Blue Arty		Value 0.1	Weight 1	Red/Blue Aircraft		Value 0.1	Weight 1		
Event	Closest event from Shamil Basayev's learning and experience					Mission		Scheme		Outcome		Effect experienced		Response effect (intent)			
6	Defence against 120 T72/T80/BMP/BTRs and 5000 infantry of Russian Group North in Dec'94-Jan' Counter-strike							Defend in depth		Loss		Seize Buildings		Destroy Ground manoeuvre			
Situation experienced															Measures of Effectiveness		
Terrain		Dense urban		Features		Cities		Climate		Cold		Disposition		Surrounding		En Inf losses	6096.00
Blue #Inf		38000		Blue #Armour		120		Blue #Arty				Blue #Aircraft				LER Inf	0.22
Red #Inf		5000		Red #Armour		4		Red #Arty				Red #Aircraft				% Inf	0.27
Red/Blue Inf		0.131578947		Red/Blue Armour		0.033333333		Red/Blue Arty				Red/Blue Aircraft				RC ex % Inf loss	0.11

# Toy model | Benefits

## **Operational Red teaming and wargaming**

- Encodes knowledge of Red's commander in relation to our plan
- Enables the process of thinking about Red's 'vote'
- Make initial suggests for the team to work up

## **Identifying risks**

- Which decisive conditions and supporting effects the Red commander has the most will and skill to resist
- When Red will pose the greatest risk to the success of the next phase of COAs due to a peak in the commander's learning cycle

## **Identifying opportunities**

- When Red is vulnerable due to a trough in the commander's learning cycle
- When we should, and should not, 'remove' a Red commander for maximum impact



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