

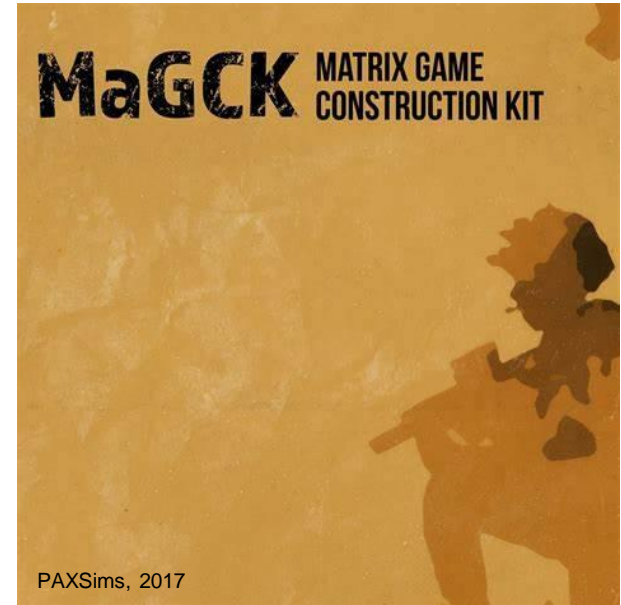
Beyond the Matrix

Overcoming the limitations of Matrix Gaming for analytical applications

DSTL/CP152114



- Dstl sees value in, and frequently uses Matrix Games for a range of purposes
 - This led us to support the design of the Matrix Game Construction Kit
- Matrix Games used properly are a powerful tool
 - As an educational method, they are great at immersing players in emerging narratives, and rapidly seeing how choices and dilemmas play out over time
- Matrix Games can be useful for representing complex problems, flexibly and rapidly
 - As an analytical tool, they can be useful for defining the problem-space, identifying variables and relationships and eliciting expert judgement
 - All of which can be explored further with subsequent analysis or more structured games





Crown copyright, 2023

- Well-designed Matrix Games can address many of the issues I will talk about
- There are many techniques that can be employed to improve Matrix Gaming, especially when combined with other game approaches and analytical methods
- Having designed, played and observed Matrix Games, the following observations relate to Matrix Games as I have most often seen them employed

- The open and flexible nature of Matrix Games means there are few structural or mechanical controls to ensure games are analytically useful
 - ‘Unknown unknowns’
 - Progress of games is heavily judgement-based
 - Unbounded games in which anything is possible have limited / no data or guidance to support judgement
 - Players and adjudicators don’t know what they don’t know
 - This can lead to the game proceeding on false or flawed assumptions
 - Skewed representation
 - While theoretically able to represent a broad range of factors, games skew towards representing the topics / capabilities / issues players are expert in
 - Inappropriate balance
 - Matrix games usually represent all actors equally, underplaying the range and importance of some players’ roles, while artificially inflating others
 - Lack of repeatability
 - Reliance on rapid-fire adjudicator interpretation can lead to significant variation in how similar actions and outcomes are judged between games or even within games

- Matrix games place a huge onus on adjudicators to make on-the-fly decisions
 - Adjudicators must weigh the strength of arguments, interpret die rolls and make judgements about outcomes
 - These are all at risk of being consciously or unconsciously biased by the adjudicator's own knowledge and world-view
 - Crowd-sourcing adjudication, for example by using estimative probability cards, risks reinforcing group-think
 - Poorly-run Matrix Games risk merely repeating the biases and assumptions of the players, and particularly the adjudicator



Crown copyright, 2023

- Poorly documented adjudicator judgements make it harder to understand (in post-game analysis) why things happened the way they did and how sensitive those outcomes were to different actions or assumptions.

- Dstl are a signatory of the Derby House Principles for promoting diversity and inclusion in wargaming
 - Amongst other things, these Principles make clear that no one should feel excluded or unwelcome from games for any reason
- We need to do more to think about whether we are doing enough in our game designs to ensure that everyone feels able to contribute
- Matrix Games *can* be quite hostile and unwelcoming:
 - People's ideas are subjected to public scrutiny and judgement by their peers
 - People are rewarded for how clearly they articulate their ideas and confidently argue in front of a group
 - The most senior or most expert voice in the room can often dominate and push out other perspectives
- Matrix Games can be daunting to people who are less confident, newer to gaming, or have backgrounds and perspectives that differ from the rest of the group





- In 2021, we began evaluating methods for producing analytical strategic games that were more repeatable and comparable whilst retaining some of the flexibility and rapidity of Matrix Games
 - We sought to eliminate on-the-fly, free adjudication wherever possible
 - We sought to add increased structure as a handrail to help players consider a fuller range of options, beyond their immediate expertise
 - We sought to add more consistent outcomes to the games, so the range of possibilities, good and bad, were consistent across games
- At around the same time, we also identified the need for games that could be played by our sponsors and stakeholders, without gaming experts being present
 - This would allow them to use gaming more frequently, at different points in decision processes, and in crises where ease of design, adaptation, setup and execution were key
 - This drove us towards the need for a game that was easy to play and execute by non-experts, whilst also being adaptable to a range of uses and scenarios

Resulting in... “CONTESTED: Strategic challenge in an uncertain world”

- Contested is essentially a Matrix Game with rigid adjudication
- Players still have a lot of latitude to shape events through a broad spectrum of activity, but they are provided with an extensive actions list to guide their decision-making
- Carefully produced documentation and materials aims to make the game easy to play while also ensuring mechanics are transparent, open to scrutiny, and easy to change



CONTESTED contains maps, action lists, action forms, player boards and four different scenarios

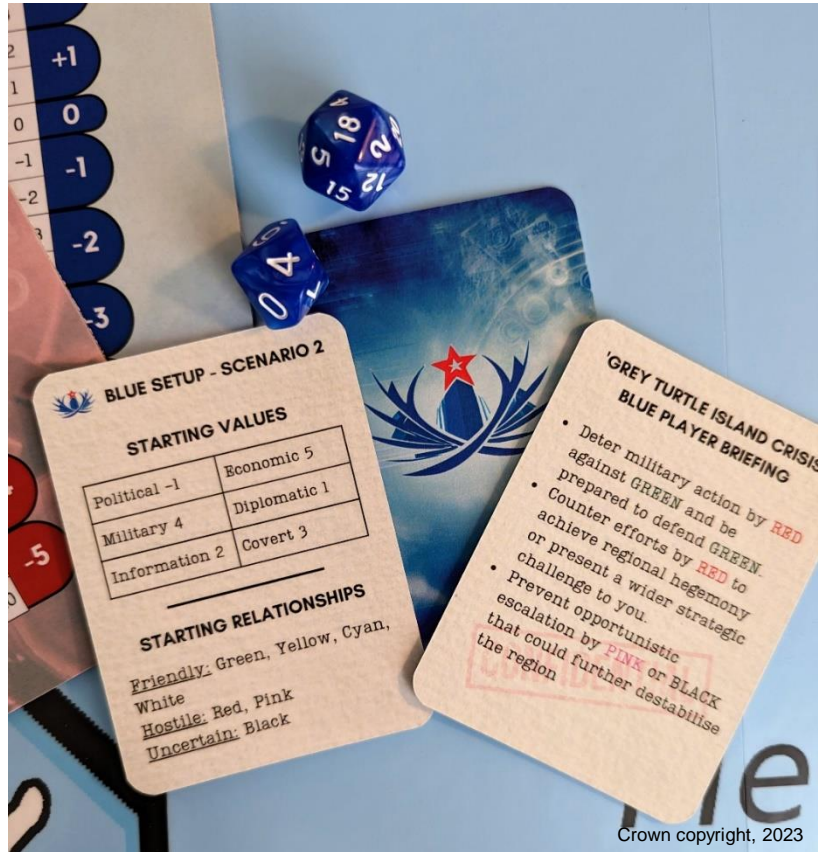


Crown copyright, 2023



Crown copyright, 2023

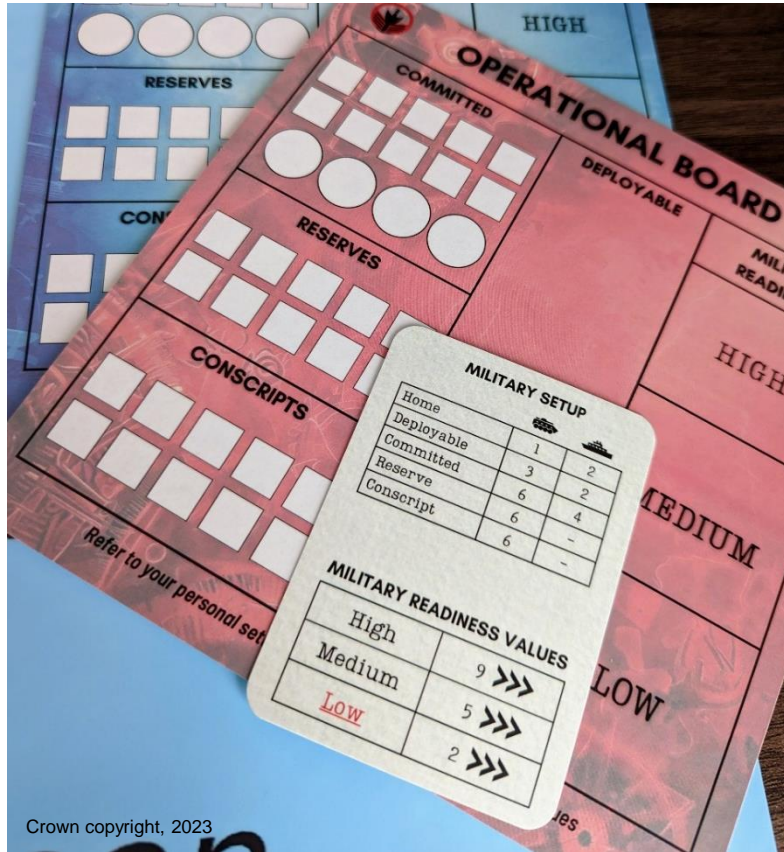
Players have personal objectives and different starting conditions



Effort has been made to ensure that game setup is **quick** and **intuitive**

Personal objectives help to provide a **direction** for players at the start of the game

An operational phase enables a way to resolve conflict within the game



Conflict can occur within the game, but will play a larger part in some scenarios than others

Each player has different starting conditions and ability to generate, deploy, employ and draw down forces

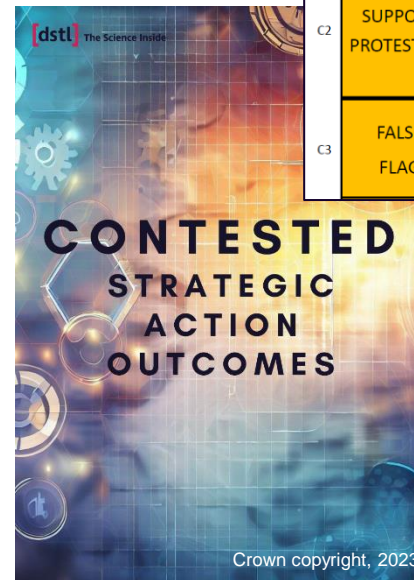
Outcomes are determined using a 'four box' adjudication system

Potential impacts of each action and chances of success are pre-determined and included in an 'adjudication outcomes' booklet

Each action contains guideline text to describe the outcome

More experienced adjudicators can elaborate on this if they wish

COVERT ACTIONS (C1-C5)						
CODE	ACTION	MODIFIER	GREAT (19-20)	GOOD (10-18)	BAD (3-9)	TERRIBLE (1-2)
C1	SABOTAGE	COV	TARG: -2 TRACKER "Sabotage of critical infrastructure in TARGET cripples core infrastructure and leads to chaos in their ranks. No indication of origin."	1 COV TARG: -2 TRACKER "Physical sabotage of critical infrastructure in TARGET has damaged important targets. Intelligence assesses high likelihood of foreign origin."	1 COV TARG: -1 TRACKER "Disruption of infrastructure by sabotage is discovered in TARGET. Intelligence believes CELL likely responsible."	-2 COV TARG: +1 COV "A sabotage attempt by CELL against TARGET has been discovered, with operatives captured and key intelligence vulnerabilities exposed."
			TARG: -2 POL -1 INF "Protesters and domestic activists in TARGET are galvanised, intensifying activity against their government."	1 COV TARG: -2 POL "Protests have flared up in TARGET over assorted issues, with high morale. Intelligence assesses potential foreign support."	1 COV TARG: -1 POL "Protests are simmering in TARGET, with mild support for their demands. Intelligence assesses CELL potentially responsible."	-2 COV TARG: +1 POL "Support by CELL intelligence agencies towards protesters in TARGET have been revealed, to much anger."
C3	FALSE FLAG	DIP INF	Free adjudicator: Adjust trackers according to the desired effect, modified subjectively according to their roll.			
			Free adjudicator: Create your own narrative based on their false flag attempt, and how successful their modified roll was.			



- We see Contested as not just a self-contained game, but also a framework that can support further modules
- We are seeking to create 'expansions' that can address areas of policy gaming to a higher level of detail
- We will also use the game framework analytically, with additional design work, to address real world questions

CREATING YOUR OWN SCENARIOS

CONTESTED scenarios encompass the spectrum of oppositional international relations: competition, crisis, and conflict. As you embark on crafting your own scenarios, adhere to the following principles to ensure success:

- Define the exercise purpose (e.g. analysis, education, experiential learning).
- Consider who the players are and how to immerse them.
- Determine the levels at which decisions are to be made (e.g. strategic, operational or tactical).
- Define clear and comprehensive success parameters, taking into consideration the participant and stakeholder viewpoints.

Custom Rules

The ruleset for CONTESTED is flexible enough to create scenario specific rules and examples of this are shown within scenario 3 and 4. These enable the game to explore different strategic elements and can help to support different narratives within the game. Game designers should consider this when wanting to create more advanced scenarios.

Crown copyright, 2023

- Contested strikes a carefully set balance between flexibility and rigidity
- Free narrative still plays an important role in the 'story-living experience' while the rigid adjudication system allows for more consistency and repeatability
- Adjudication outcomes are the process of careful deliberation, which has been subject to peer review, SME judgement and extensive playtesting
 - Designed to drive gameplay towards certain types of situation and avoid others, whilst not being overly prescriptive or deterministic
 - These design choices are transparent and can be adjusted
 - Eliminates the pressure, risk of bias, or inaccurate assumptions inherent in on-the-fly adjudication
- Simple order submissions forms aid data capture
- Different player starting conditions and game objectives create a more nuanced form of balance

[dstl] The Science Inside

Discover more



© Crown copyright 2023, Dstl. This material is licensed under the terms of the Open Government Licence except where otherwise stated. To view this licence, visit <http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3> or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or email: psi@nationalarchives.gov.uk