

Keep it Moving! Design Notes

What is operational momentum is difficult to answer,¹ but for the simple purposes of this game it is loosely defined (in a Patton-esque way) as “the ability to keep punching the other person in the face.”² What variables affect operational momentum is a similarly difficult question to answer, in this game time and attrition are the major variables.

Thus, the game seeks to create discussion on the following questions:

- What is operational momentum?
- How is operational momentum affected?³
- How do you manage attrition and how does that affect the chances of a decisive battle?

To keep focus on those questions the game is abstract in nature, both in theme and in abstracting tactics and space. This abstractness in terms of theme avoids an overfocus on a specific operation, doctrine, or forces that would distract players from the core of the game: a theory of operational momentum to pick apart, discuss, and critique. This logic also extends to the decision to make both space and battles relatively abstract. This avoids rivet counting to focus on the big effects and the myriad of different effects affecting operational momentum as opposed to just looking at time, space, positioning, and force ratios that would bog down a discussion. Furthermore, the goal of the game is to look at a multitude of factors, so if some of the more common things in reality are slightly underrepresented in how common they would be or are modeled only in their end effects (not processes) than that is a good tradeoff to make to increase the variety of effectors of operational momentum showcased in the game.

On the core theory of operational momentum my belief is that time and attrition are the major variables in operational momentum. This theory is derived from the following. Wallace⁴ names motion, mass, sustainment, and initiative as the four important parts of operational momentum. Lovett⁵ looking at operational momentum on the offensive identifies 1) scale of action (frontage, concentration, and sustainment) 2) “rapid and exploitable penetration of the enemy's tactical depth” 3) “minimize enemy resistance in depth by ... simultaneous attacks in depth ... and secure critical points along the line of advance, and rapid penetrations to deny him time” 4) “maximum speed” 5) mass at key points, and 6) sustainment. Lovett's 6 points compress down well into Wallace's 4 points, and I further compress these in the broad conceptual categories in the

¹ *By Too Many Names - Operational Momentum*, Thomas R. Wallace Lt. Col, US Army, 1994, Naval Postgraduate School Thesis, <https://apps.dtic.mil/sti/pdfs/ADA283467.pdf>, see pg. 4-7. Further years after Wallace's publication have not alleviated the problem he identifies (see pg. 17-18) of a shared definition of Operational Momentum.

² Note my views on Operational Momentum are more complex than this may belie. My views in this game are mostly shaped by the Russo-Ukrainian War (especially the work of Rob Lee, Michael Kofman, and others), the 2023 Israeli invasion of the Gaza Strip, and to a lesser degree the Western Front of WW2. The papers *By Too Many Names - Operational Momentum* (*By Too Many Names - Operational Momentum*, Thomas R. Wallace Lt. Col, US Army, 1994, Naval Postgraduate School Thesis, <https://apps.dtic.mil/sti/pdfs/ADA283467.pdf>), and *The Essentials of Operational Momentum* (*The Essentials of Operational Momentum*, Major Brian A. Lovatt, 1987, School of Advanced Military Studies Monograph, <https://apps.dtic.mil/sti/pdfs/ADA184741.pdf>) are also the basis for my views. Numerous other wars, engagements, and other pieces of information inform this view, but those are the major ones. As for the Patton quote, this is based on his remarks to the Third Army, a set of remarks that is worth a read.

³ Of course, the effectors of operational momentum may differ depending on unit size. Here a brigade is used, but the game would still apply if one were to have it at divisional level (though the game would be less accurate at battalion level). Conversely only certain cards in the game would make sense at Corps or Army level. This can be intuited, operational momentum in this game occurs at an operational level, so while some effects are consistent across tactical-operational-strategic, some are not, and divisional (as it slots in at the operational level of war), works better than Battalion or Corps.

⁴ *By Too Many Names - Operational Momentum*, Thomas R. Wallace Lt. Col, US Army, 1994, Naval Postgraduate School Thesis, <https://apps.dtic.mil/sti/pdfs/ADA283467.pdf>, see pg. 5-6.

⁵ *The Essentials of Operational Momentum*, Major Brian A. Lovatt, 1987, School of Advanced Military Studies Monograph, <https://apps.dtic.mil/sti/pdfs/ADA184741.pdf> pg.37.

game of time represented by cards (motion and initiative = time), and attrition of forces (available mass and sustainment = ability to resist attrition). These are represented thusly in the game:

<i>Element</i>	<i>Wallace</i>	<i>Lovett</i>	<i>Implementation</i>	<i>In Game Representation</i>
Motion	X (Motion)	X (Rapid Penetration) X (Maximum Speed)	Represented as key element of Momentum (e.g. finite resource) – Importantly the player must choose to pause or not pause (e.g. maintain Momentum and Initiative or not).	Time
Initiative	X (Initiative)	X (Minimize Resistance in Depth) X (Maximum Speed)		
Mass	X	X	Represented in force degradation	Attrition
Appropriate Scale		X	Subsumed into Mass	
Sustainment	X	X	Effector of attrition	

Time is important as it gives the enemy the ability to prepare, maneuver, and generate combat power. If one is operating faster than their opponent then one will maintain (or generate) momentum, whereas if one is slower the opposite will occur (a sort of negative feedback loop). This is represented in the game with the drawing of cards representing time passing and in the decisions the player makes to trade time for something else (regeneration of forces requiring a pause for example).

My view of Attrition (note that attrition doesn't just mean soldier and material losses at this level but also the burning up of supplies, fatigue, and other intangibles) as the other major element comes heavily from the Russo-Ukrainian War and WW2, nicely summed up by Michael Kofman's repeated statement that "attrition enables maneuver".⁶ Note that the ability of units in this game to keep fighting even when ground down heavily (more than classically assumed to make a unit "combat ineffective") is based on *The Relationship of Battle Damage To Unit Combat Performance*.⁷ Some may argue space is another important element as well, but I view space as part of the equation that makes up time, and hence not worth representing on its own (the Long Road March card is the exception to this), and thus space is abstract in this game and assumed to otherwise have effects as necessary. Attrition is represented though the levels of damage that units accumulate.

In this game I made a conscious decision to have a decent chance that players would not have a "Win" or "Lose" outcome. Winning or losing is done through the drawing of the *Decisive Battle* card, the intention of which was to show that forces needed to be in a very good state to inflict such a decisive blow on the enemy that it is decisive on the overall outcome of an operation or war. There is some bias towards the player of the game in that most units in a campaign don't engage in the potentially decisive battle with the enemy (of course the whole idea of decisive battle can be debated too), but the player is much more likely than the average unit to end up in the decisive battle because it is interesting to do so (and people like to be the heroes in their games and win the day, high stakes make for a good game). On the other side however, I also wanted to represent the high likelihood that most units experience in fighting where they push until exhausted and have to conduct an operational pause or be rotated off the line. Thus, a roughly 75% chance of an Operational Pause outcome or a 25% chance of a Win/Loss outcome in a run of the game balances these two competing types of outcomes.⁸ I also choose not to paint this

⁶ See for example *Making Attrition Work: A Viable Theory of Victory for Ukraine* by Franz-Stefan Gady and Michael Kofman, February–March, <https://doi.org/10.1080/00396338.2024.2309068>, pg. 7.

⁷ *The Relationship of Battle Damage to Unit Combat Performance*, Leonard Wainstein, 1986, Institute for Defense Analyses <https://apps.dtic.mil/sti/pdfs/ADA170631.pdf>.

⁸ Most games end up going though ~20 cards (of 43) so there is a ~50% chance to not have a decisive battle. Even when the Decisive Battle card is drawn it is possible (I estimate based on the games I have seen ~50% of the time) to thread the needle on it and not win but not lose the decisive battle and continue to an operational pause outcome.

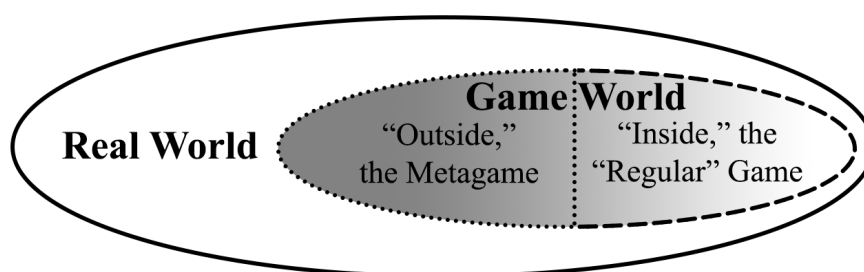
operational pause outcome as a negative outcome as it is neither good or bad, rather an operational pause outcome is a neutral outcome. Representing this neutral outcome that a commander is likely to experience in an operation I view as important for verisimilitude to real life (and for a educational discussion of operational momentum). When a decisive battle doesn't occur, a unit will be slowly ground down until it needs to stop or be rotated off the line and this inclusion was therefore important.

Repeatedly raised in playtesting is the question of “why there is no penalty for being unethical in the game?” If the player does nothing on the *Refugees* and *Civilian Disease Outbreak* cards, the player suffers no ill effects in game. For the *Ethics Breach Card*, the player is directly incentivized to do nothing in game, as they would be relieving the commander of the best battalion they have, hobbling its ability to fight. It is true that in the game there is no penalty for being unethical (sometimes there is even an advantage to being unethical⁹), but there are two reasons why I did this:

1. In the real world there is (generally) no incentive in doing these things (e.g. it does not provide a tangible benefit to the unit's mission),¹⁰ in fact sometimes it may be very determinantal to act (for example if the unit needs to keep advancing on a key objective).
2. A slightly more esoteric point is that people from a moral/ethical perspective will feel a compulsion to do these things in real life regardless of the lack of a direct incentive. This is implemented as follows.

Starting with a bit of theory from my PhD,¹¹ I expand on the base conceptualization in Wake¹² to come with a conceptualization of the space in which games take place. Wake is helpful in understanding that board games exist in two simultaneous modes while being played. There is both the game being played “inside”; what we typically consider to be the game, like chess with pieces on the board, or the “regular” gameplay that we think of. There is also the metagame between players playing the game “outside” where mind games, negotiation, and metaknowledge affect play. These are not wholly rigid categories and different games blend and combine them in different ways, and the same parts of the game may be in one or the other (or both) in different games. One must understand that the game world is much larger than might be intuitively understood and incorporates part of the world outside of the game, making it part of the game world, while being affected by the real world as well. This conceptualization is something like this:¹³

A Rough Conceptualization Of The Space In Which Games Take Place



Dashed Lines indicate permeable boundaries, dotted very permeable boundaries

⁹ The exception to this would be evacuation of civilians for the *Urban Battle* card (as happened in 2nd Battle of Fallujah) where doing the right thing (minimizing civilian harm) also provides a tangible benefit (expanding ROE and what supporting fires can be used, making the fight easier).

¹⁰ This does not mean that it provides no benefit, just not a *large tangible benefit* to the commander's mission.

¹¹ My PhD is in the production and effects of immersion in professional wargaming.

¹² Wake, Paul. 'Token Gestures: Towards a Theory of Immersion in Analog Games'. *Analog Game Studies* 9, no. 4 (16 September 2019). <https://analoggamestudies.org/2019/09/token-gestures-towards-a-theory-of-immersion-in-analog-games/>.

¹³ If this all sounds very academic, it's because it's close to verbatim from part of my PhD work.

Thus, this combination of having no real world (“inside”) incentive to act (see point 1 above), but a personal ethical/moral compulsion to act (“outside”) is a more realistic modeling of how and why people would act even when it might be detrimental to their stated (“inside”) objectives, than incentivizing action through an in-game bonus.¹⁴

Some specific cards are based on certain historical occurrences or bear some explanation:

- Breakthrough – The Breakthrough card posits that the player must first breakthrough (e.g. 1 success), but then can exploit (further success), but runs a high risk of being counterattacked and cut off if they over extend (costs for any units scoring failures).
- C2 Under Attack! – Western militaries have not had to contend with their C2 networks coming under any sort of large scale and sustained attack in wartime for decades, and often cannot practice loss or degradation of communications in garrison.¹⁵ Thus, I put this card in to make players think about the importance of coordination of forces to sustain operational momentum.¹⁶
- CBRN Risk – Based off Gulf War fears (and drills) of Saddam using CBRN weapons against Coalition troops.
- Ethics Breach – A military that acts ethically and follows its ethical guidelines when they are broken is of high importance. On those grounds it warrants including in wargames wherever possible, before considering that it also presents an interesting dilemma to the player (permanently make your best battalion worse). See the above section of the design notes on why the ethical dilemma presented is included in the manner it is.
- Fatigue – A general gripe of mine is that rules fail to include fatigue of units and how it affects fighting, hence the appearance of fatigue in this game.
- HQ Struck! – Based on renewed discussion about the vulnerability of command posts due to their large signature in a more transparent modern battlespace.¹⁷
- Long Road March – In my discussions with a wargamer who has assisted on looking at road marches with the British military, it appears that this has become somewhat of a “lost art” from the days of the Cold War. Thus, I wanted to include this to show its importance, as well as illustrating that repositioning of forces eats into operational momentum.
- Preparation – This represents serious time dedicated to planning and use of various ISR assets (at brigade and above) to see what is (or might be) coming and preparing to meet those challenges.
- Refugees – Fighting displaces people creating immense human suffering. It often doesn’t immediacy concern (or is not the immediate responsibility of) military commanders on the ground during large scale combat operations, but refugees have a large effect on the post

¹⁴ Of course, I know that many people playing a game will discount their morals as it is “just a game”, but it is for the small group of players who do not do that or are so deeply immersed in a game that this becomes a real decision with real tradeoffs that this is done. At the very least the discounting of ethics in wargaming by students can be a useful instructional point for students in understanding how we engage with the tool and how that may affect results of games.

¹⁵ *Thinking Inside the Box – The Gauntlet*, Episode 3: Delegating Decision Making, LTC Adam Latham and MAJ Timothy Davis, <https://www.dvidshub.net/podcast/574/thinking-inside-the-box-the-gauntlet>

¹⁶ Taylor lists the typical reason for culmination of brigade attacks at the National Training Center as “the inability to communicate reliably.” See *Preparing Your Unit To Win The First Fight Of The Next War*, Curt Taylor, March 1, 2024 <https://mwi.westpoint.edu/preparing-your-unit-to-win-the-first-fight-of-the-next-war/>, or if you are more podcast inclined see the NTC’s podcast, *Thinking Inside the Box – The Gauntlet*, Episode 3: Delegating Decision Making, LTC Adam Latham and MAJ Timothy Davis, <https://www.dvidshub.net/podcast/574/thinking-inside-the-box-the-gauntlet>.

¹⁷ See works like *The Graveyard of Command Posts, What Chornobaivka Should Teach Us about Command and Control in Large-Scale Combat Operations*, Lt. Gen. Milford Beagle, Brig. Gen. Jason Slider, Lt. Col. Matthew Arrol, U.S. Army, May-June 2023, <https://www.armyupress.army.mil/Journals/Military-Review/English-Edition-Archives/May-June-2023/Graveyard-of-Command-Posts/>; or discussion from the National Training Center: *Preparing to Win the First Fight of the Next War*, Feb 23, 2024 Maj. Gen. Curt Taylor, <https://mwi.westpoint.edu/preparing-to-win-the-first-fight-of-the-next-war/>; *Preparing Your Unit to Win the First Fight of the Next War*, March 1st, 2024 Maj. Gen. Curt Taylor, <https://mwi.westpoint.edu/preparing-your-unit-to-win-the-first-fight-of-the-next-war/>. or again for the podcast inclined *Thinking Inside the Box – The Gauntlet*, Episode 6: Command Post Survivability, Maj. Steven Pyles, and Capt. Seth Revetta, <https://www.dvidshub.net/podcast/574/thinking-inside-the-box-the-gauntlet>.

conflict (or creating instability and more conflicts down the line) and can clog up movement routes. As many wargames have a “clean” view of warfare devoid of civilians, I try to include civilians in wargames whenever possible as a counter to this. See the above section of the design notes on why the ethical dilemma presented is included in the manner it is.

- Regeneration – These allow you to only regenerate one battalion, forcing the player to choose. In large scale combat operations, I would expect this to be less deterministic than the player choosing, but this is a concession to playability and player agency.¹⁸ Also note that “Regeneration” (though this may often in game terms be representing “reorganization”)¹⁹ is in response to attrition (here a combination of KIA, WIA, morale, equipment losses, supply issues, C2 degradation, unit quality degradation, etc.).²⁰
- Secure POW’s and Movement to the Rear – A conversation I had with some members of the British military is that they are unprepared for how to deal with a large number of POW’s in wartime (I cannot assess this perfectly as I was not able to talk to a MP who might have more knowledge on the subject). The experience of the Gulf Wars also shows that many frontline units were unprepared for such an eventuality on such a large scale. This card is included to make players think about handing such an eventuality, and the effect it would have on a unit and its momentum.
- Urban Battle – the ability to evacuate civilians to open up the ROE to make the fighting easier is based on the 2nd Battle of Fallujah.

Images

- Regular Deck Images – Urban and Decisive Battle cards are from the Taiwanese MNA, all others are from DVIDS. All images are in the Public Domain.
- Northern Operations, Woodland Warfare, and Desert Deck Images – The Decisive Battle card is from the Taiwanese MNA, all others are from DVIDS. All images are in the Public Domain.

¹⁸ Basically, that brigades are not one day allocated a platoon or companies worth of new kit that all goes to one battalion of the brigade commander’s choice, but rather when they are on the attack that they get new kit and personnel as well as personnel returning to duties and repaired equipment at various different points in time and allocate it when it becomes available.

¹⁹ See *ATP 3-94.4 Reconstitution Operations*, May 2021.

https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN32296-ATP_3-94.4-000-WEB-1.pdf.

²⁰ See *The Relationship of Battle Damage To Unit Combat Performance*, Leonard Wainstein, 1986, Institute for Defense Analyses, specifically pg. 2 and pg. 11-12 for several of these attritional factors.