CONNECTIONS UK 2019
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QUANTITATIVE vs QUALITATIVE GAMING

Arguably the most basic divide in wargaming is between games using a fundamentally mathematical model of reality and those where player decisions are shaped instead by informal assumptions and experience about the workings of phenomena ranging from platoon attacks to international crises. Hobbyists and gaming professionals tend to prefer formal models while non-gamers are more comfortable with informal discussion exercises. This Deep Dive explored the quantitative vs qualitative divide by splitting attendees into 5 roughly equal groups, each with a mix of quantitative and qualitative gaming experience, and each discussing an important sub-question as shown below. The resulting notes were written up by the 5 group chairs, allowing the creation of this report.

- What are the strengths and weaknesses of quantitative and qualitative approaches respectively?

- Are particular topics and game objectives more suited to quantitative or qualitative approaches?

- Do games which try to blend quantitative and qualitative approaches offer the best or the worst of both worlds?

- Should we try to move users out of their comfort zones of quantitative or qualitative gaming, and if so how?

- What should be counted in each type of game, and how? (This question was added after initial discussion among the Deep Dive participants.)

Q1: What are the strengths and weaknesses of quantitative and qualitative approaches respectively?

- Strengths and weaknesses of quantitative vs qualitative gaming depend on the objective of the game.
  - Quantitative gaming is particularly useful when there is a known set of possible solutions or if the objective is educational and drives players towards consensus.
  - Qualitative gaming can tease out nuances of issues, problems, constraints, disagreement or divergence experienced within a given policy challenge – this is useful if the objective is not necessarily to identify a solution.

- Trust in the robustness of the outcome of the game is a key factor.
  - It is more difficult to argue the outcome in a quantitative game as opposed to a qualitative game.
  - Data capture is easier in a quantitative game (cold, hard facts).
  - Qualitative gaming is more likely to be subject to issues of transparency and bias.

- Considerations for organising a quantitative vs qualitative game include the following.
  - Quantitative games are easier to control.
  - Quantitative data is time-consuming to produce and takes longer to organise.
  - It is more difficult to adapt the game on the fly in a quantitative game
  - You need more expertise in a free game, while in a rules-based game you have something to refer to.
  - Quantitative games require more training to be able to implement, and the players need more training to be able to play and understand the rules of the game and because the model is expecting a particular set of inputs.
  - Quantitative games require more infrastructure (computers).
  - Speed of adjudication is quicker in a quantitative game.
  - Qualitative games are cheaper to run and arereusable.

- o Qualitative gaming is very dependent on the participants and vulnerable to group-think, which is perhaps acceptable in an educational game vs a game evaluating defence capability development options
- o Quantitative games are easier to disrupt, so the quality of the game play is highly dependent on the facilitator.

Q2: Are particular topics and game objectives more suited to quantitative or qualitative approaches?

- Consideration of which type of game to use can be considered a multi-stage process:
    - o The topic and objective may not be aligned with respect to the type of game being considered.
        - ▪ For example, a game's objective may be to convey a qualitative training message while its playing process is a primarily quantitative one.
        - ▪ High numbers of qualitative games can produce quantitative results.
    - o Target audience can dictate the type of game.
        - ▪ Qualitative games can be more suited if players are inexperienced
        - ▪ Quantitative games can be more suited if players are experienced
    - o Feasibility of game requirements can define the type of game
        - ▪ Resource must be considered for quantitative and qualitative games alike
        - ▪ Game design may dictate the game type (data collection process)
        - ▪ For a qualitative game, human SME judgement is required
        - ▪ For a quantitative game, data and parameter definitions are required
    - o The output of the game has a heavy weighting on the type of game
        - ▪ For some topics, qualitative and quantitative games are equally suited
        - ▪ The objective will primarily define the type of game
        - ▪ The distinction between whether qualitative or quantitative games should be used is how the output is used after the game

- Summary: it depends!
    - o Struggled to define how to fit topics and objectives to qualitative/quantitative games in the short timeframe, but a short list is given below.

Topics and Objectives suited to:
- Qualitative Games
    - o Policy-oriented
    - o Future/innovation
    - o Hybrid warfare
    - o Generating new ideas
    - o Gaining insight
    - o Training
- Quantitative Games
    - o Course-of-action analysis
    - o Comparison of data directly between red/blue
    - o Stochastic processes
    - o Statistical analysis
    - o Validation

Q.3: Do games which try to blend quantitative and qualitative approaches offer the best or the worst of both worlds?

A vote at the beginning of the session showed that 80-90% of attendees were in favour of blended games (with caveats).

1. It's all in the Design! (as with all wargames)

a. What is the aim/question – does it have elements that are best investigated by one type or the other, if a mix then a blended approach may work best

b. What is the situation? As above, some elements of games lend themselves better to either 'Q' (politics more qual, tank on tank more quant?). The level of game (tac, op, strat) may have a bearing on this, but not always.

c. Does size matter? Will some games always suit certain types? Strat Pol-Mil is likely to be qual, Tactical unit combat likely quant, so is operational most likely to be blended? Or does it depend on the type of conflict/competition? ie Stabilisation vs Conventional conflict?

d. What do the following expect?
   i. Customer – what do they have in their minds' eye about your work? Is it all about the shiny event or detailed analytical output? Have they seen one type of game or the other and liked it? It may be that a blended game provides a good balance of good output and what they are expecting!
   ii. Players/Attendees. Seasoned wargamers, or complete novices but with relevant knowledge? What will be most accessible, and what are they expecting? It may be that they are looking forward to seeing some dice rolls, but not able to digest a very detailed rulebook.

e. What expertise do you have in the facilitation/design team, and who is available for the actual event? The game will fall over on its weaknesses; by having a blended game you need experts in both Qs.

f. How will the output be used?   If it is essential to have highly detailed numerical output then a blend may not be fit for purpose.   However, have the discussion about what detail is required.

g. Time and budget, and what's in the cupboard. T&B are always the ultimate arbiters for professional games. Lack of either may mean that you can add bits onto something already in the cupboard, so may decide the type, or adapt/blend to make it closer to what you require. Broadly, a qualitative game is quicker to generate, so could be the base that quant elements are added to as you have time.

2. Discussion points on when a blended approach may fail
   a. When it needs more variety of resource and that is not available, then falls down when it is pushed ahead anyway
   b. It needs to be credible, so yet again all parts need to be done well
   c. Coherency – if it becomes 2(+) games existing in roughly the same space and time, rather than a single whole game with interlinking implications

3. Things that need to be considered
   a. What data do you have available? Will qualitative elements allow 'papering over the cracks', or will it just lead to less understood areas (ie Influence, Cyber, C2 etc) being either ignored, or being turned into 'magic wand/fairy dust' by a convincing player?
   b. In many cases, a blended approach allows some space for going off playbook and adding some innovative thought. However, I have also run quantitative games where the player used very well defined units in a very innovative way, and some qualitative games where everyone just did the same old thing and acted on their same old biases.
   c. Biases – a single quantitative designer may just bake in all their biases; maybe a blended game can counteract that? Or maybe it just introduces a whole new set as well as those from a set of players?
   d. Could a blended programme of work fulfil the requirement better? This would allow for a range of perhaps smaller games along with perhaps a variety of analysis using simulation and other techniques. This has the advantage of the customer then not expecting all the answers to come from a single big event.
   e. Can any game ever only be quantitative? If there is a chat about the tactics being used over coffee, and then an agreement to change tactics, or work together in a different way, maybe with the promise of a

few beers for being a 'forlorn hope' or the chance of glory, then hasn't a load of new, intangible metrics been added? Does that make it qualitative and should this all be captured too? Equally, if players come from a branch of the military that is trying to make the case for a certain bit of kit, are they more likely to use that in the game to try and show its utility? Is there already a political sub-game being played before the dice rolling even commences?

Q.4: Should we try to move users out of their comfort zones of quantitative or qualitative gaming, and if so how?

<u>Yes we should</u> for *stakeholders and customers.* A professional wargamer should be the one who decides what level of quantification is appropriate and affordable. Some questions are much better answered with a quantitative game (e.g. "how should low level tactics change if we get a new anti-tank missile?"). Others, such as inventing entirely new concepts, may better suit a qualitative approach. But qualitative games tend to be cheaper, so given time and budget constraints, compromises may have to be made. How much is for the professional to decide. With stakeholders the rule should be "Engage… engage… engage… but be prepared to walk away".

<u>No we should not</u> as much for *participants*. We should try to keep participants comfortable, otherwise we may build up resistance to the games.

Some players will dislike the "role play" aspects, the "blank page" aspects and the dominance of the facilitator that come with qualitative games. Others will dislike the straitjacket of quantitative rules, especially if the rules do not conform to their view of reality.

Beware that professional wargamers may not be typical of the population as a whole. 90% of wargamers may be immediately happy with the level of abstraction in a commercial board game. Probably a lower percentage of the participants we get for our games will also be.

<u>Yes we should</u> if the wargame is for *training purposes*. People learn more when at the edge of their comfort zone (although not over it). If a wargame is to train, it should push people to the edge of their thinking, not just get them to repeat doctrine. Note that using a language that players understand can help them extend their comfort zone. For example, Bankers are used to numbers, so they may feel happy expressing a qualitative effect as a number (e.g. "How happy are you on a scale of 0 to 10?").

<u>No we should not</u> if the wargame is analytical and the person is a *subject matter expert*. Hopefully SMEs should be brought to a wargame to add their expertise to the game and should be used in a role they feel comfortable with (an infantryman should play an infantryman, not a logistician).

In summary, in an educational game students learn best at the edge of their comfort zone; in an analytical game SMEs can teach better when well within their comfort zone.

Note that being in a comfort zone depends on the other players as well as the the game that they are playing. In a particular wargame, Colonels beat Captains, and felt comfortable. When the Captains were replaced by local wargaming nerds then the Colonels lost and felt uncomfortable. They may have learnt more in the second wargame, but taught more in the first.

Q.5: What should be counted in each type of game and how?

- What should you measure and why?
    - Danger of making what can be counted important, rather than finding ways to measure what actually is important.

- o Any data capture plan must be clearly linked to the game objectives, the post-game analysis that is planned, and any planned learning outcomes for the participants.

- Quantitative games might generate a lot of numerical data.
  - o This can provide useful situational awareness and help players grapple with complex decisions.
  - o On the other hand, vast quantities of data might make it harder to identify the really interesting 'so whats' and might mask the results of unexpected outcomes.
  - o Quantitative games cannot therefore rely on numbers inherently providing useful outputs and discernible insights – they might need a layer of qualitative interpretation to prioritise what is counted and extract the key insights.

- The challenge for qualitative games is what should be measured to allow for a more sophisticated and useful analysis that goes beyond merely capturing what people said and did – what can be counted or measured in a qualitative game?
  - o Surveys can be used to track player perceptions, feelings about the game, player observations and insights etc.
    - ▪ However, surveys can be intrusive, break immersion and feel to players like a poor use of their time, so remote methods of extracting measurable data are also required.
  - o Audio recording of players' conversations and textual analysis of the transcripts can provide useful insights – what did players talk most about? What was the rationale behind a particular decision? What options were discounted and why? However, they can also risk data overload and the risk of counting what can be measured, rather than what is useful.
    - ▪ Transcript analysis might be more useful if textual analysis is linked to particular roles and perspectives, but attribution raises possible ethical issues and might make players reluctant to engage.
  - o Meta-analysis can be conducted on multiple similar qualitative games to highlight common themes across games and outline the impact of changing variables between games.

- There are a number of different categories of actions, in both qualitative and quantitative games that could be measured or observed:

  - o The decision-making process that was followed;
  - o The decisions that were taken;
  - o The actions that resulted from the decision;
  - o The outcomes of the decision.

- A blend of approaches is probably best to get at these:
  - o Quantitative measurements benefit from qualitative extraction of the key 'so-whats';
  - o Qualitative games benefit from metrics and analysis that extract hidden value that goes beyond mere narrative description of what happened in the game.