# Using Futuring to Generate Better Wargaming Scenarios

*© Stephen Aguilar-Millan*
Research Director, European Futures Observatory

## Executive Summary

Wargaming can be seen as an act of anticipating future events to expose weaknesses in current thinking and to help develop strategies to overcome those weaknesses. Within this conceptual framework, the process of thinking about the future in a more systematic way can be used to help design better wargames.

From the perspective of the present, the future can be a vast space to populate. There is an extremely large, almost endless, number of possible futures that could emerge. In order to bring structure to this very large number of possibilities, futurists have developed a number of techniques to help view the future in a systematic way.

If a wargame acts as a generative vehicle for multiple futures, then playing the wargame multiple times will test the underlying assumptions of the game and provide us with a heat map of results. The heat map would help us to assess the robustness of the results. This process starts by putting the future into the wargame design. We need to start with the purpose that the wargame is to serve before we begin to think about inserting a futures approach to the design of a wargame. We need to be clear about the scale and scope of the wargame.

Whether or not such a game produces results that are convincing is neither here nor there. An unconvincing game can tell us as much about the future as a convincing game if we conduct a rigorous review of why the game is unconvincing. In many ways, that is where the injection of futures into wargame design can be useful. It forces us to identify our conscious and unconscious assumptions, and to subject them to a rigorous challenge.

In determining these issues, the wargame designer would have to confront the assumptions, which are often tacit, that are being brought into the game structure. It is by confronting these assumptions that we reduce the possibility of being blindsided by an emerging future that we hadn't previously considered. In that sense, we would become better equipped to deal with an emerging future. And that is how futuring can be used to generate better wargame scenarios.

## Introduction

At the professional level, wargaming is an act of anticipating future events to expose weaknesses in current thinking and to help develop strategies to overcome those weaknesses. Within this conceptual framework, the process of thinking about the future in a more

systematic way can be used to help design better wargames. We can think of this advantage from two perspectives – wargames that better expose the key issues facing future conflict and wargames that give better insight into how future events will unfold.

Wargames that better expose the key issues of the future are by their nature quite speculative. In their construction, much will depend upon the assumptions made by the game designers in terms of the key actors and the key relationships within the game. These assumptions are given form within the rules of the game. A more speculative approach would lead us to question the rules themselves in terms of their reasonableness in reflecting possible future events. An unfettered approach to the questioning of assumptions would provide some doubt over the validity of the game. It would be better to question the base assumptions in a more systematic way, in order to retain the structure of the game, but to vary some key elements within it. The study of the future can provide a framework in which these elements could be varied, whilst retaining the integrity of the game. It is to this framework that we shall return in the next section.

Once we have identified the key issues of future conflict, we need to consider how that could give us a better insight into future events. Using the futuring framework, we can identify a set of core uncertainties around which our studies can turn. Given the vast number of uncertainties that could arise in any future state, the study of the future has developed a number of techniques to undertake that search in a more systematic way. Obviously, much will depend upon the focus of the study, but it distils down to selecting the right tool to undertake the job in hand.

Of course, selecting the right tool is one thing, but using it properly is another. We will then move on to our final task of examining how futures can be put into game design. Professional wargaming tends to be fairly utilitarian in its approach. The game is either useful in uncovering insights or it isn't. If design futures are adequately inserted into game design, then the chances of obtaining a set of useful insights are heightened. It increases the chances of a successful game.

Wargaming the future can be really difficult. It is likely to involve uncertain entities that have access to differing and uncertain technologies, that may be organised in uncertain ways. The aim of wargaming the future is to reduce those uncertainties. This can be achieved best by introducing an element of futuring into the wargame. Using this future framework is the best place to start our enquiry.

## The Futuring Framework

From the perspective of the present, the future can be a vast space to populate. There is an extremely large, almost endless, number of possible futures that could emerge. In order to

bring structure to this very large number of possibilities, futurists have developed a number of techniques to help view the future in a systematic way. This futuring framework is used to help us tease out what we know about the future, and to help us identify the gaps in our knowledge and understanding.

The most basic form of examining the future is to assume that the future will consist of present trends extrapolated into a future space. For example, we know that the planet is warming. If we assume that the planet continues to warm, at about the same rate as experienced in recent years, then a number of consequences of that warming might be felt. To continue the example, it may cause the Arctic ice cap might melt, and that has a number of geo-strategic implications which we may wish to game.

Futurists label this type of futuring as trend analysis. The technique is very simple – identify a trend that has moved from the recent past into the present and simply assume that the trend will continue into the future. This is a pathway future, that describes how we get to from the present into the future. We may also wish to consider what the future looks like when we get there. This is an end state future. If we use trend analysis to generate end states futures, we are said to be engaged in horizon scanning. From the perspective of game design, we would use the process of trend analysis to establish the premises of the game and horizon scanning to develop the content of the game.

An example of this approach was provided at the Connections NL conference in 2018. The plenary game on Day 2 was set in 2050. The basic premise was that global warming had led to sufficient ice melt for the Arctic Ocean to be navigable. This was the result of an exercise in trend analysis. It was further built into the game that the Arctic Ocean could become a contested space between the various actors who had an interest in that contested space. That was the result of horizon scanning. A game was worked up from these basic contentions that, as it played out, yielded some interesting results. Whether it would lead to adjustments at the policy level is a matter of conjecture, but many of the participants found that it gave them food for thought about how they conceive of the future. That is the mark of a good futures project.

Whilst trend analysis and horizon scanning is one approach to the future, it is not the only one. The major problem with trend analysis, over the long term, is that trends bend and break. The trajectory of the recent past to the present is not necessarily a good guide to the trajectory from the present into the future. Circumstances have a habit of changing, and trend analysis assumes that they don't. A different set of techniques have been developed by the futures community to address the weaknesses of trend analysis.

The key vulnerability of trend analysis is that it doesn't cater for parametric change. It assumes that the future will develop broadly within the parameters currently observed. That could be a problem if there is a sudden and profound change to the parameters. For example,

there could be a change within the political sphere that calls into question the fundamental assumptions on which policy is based. Country X could be relying upon a security guarantee provided by Country Y, there is an election of a government in Country Y that calls into question the guarantee given to Country X. It is interesting to note that, in common discourse, we would see such a policy shift as a 'game changer'. We would see it that way because the fundamental assumptions of the trend analysis would be called into question.

One way to address these issues would be to see the future as a combination of various systems. The political system, the economic system, the social system, and so on. All of these systems interact with each other in the present and will continue to act upon each other into the future. A systems approach allows us to identify the key actors within the system, to determine the relationships between the actors within the system, and to determine the boundaries of the system.

We can then inject change into the various systems. We could change the actors, either suddenly or gradually, to account for the appearance of some actors and the fading of others. We could change the nature of the relationships within the systems to allow for parametric change. And we could change the boundaries of the system to account for a different world emerging in the future. This would allow us to draw a richer portrait of the future. We could set the exercise to uncover a pathway into the future, or we could set the exercise to develop an end state.

The systems approach to the study of the future fits well into the wargaming environment. This can be seen if we were to change slightly the key concepts of the systems approach. The system is the wargame. Just as a systems approach to the future would have a focus on the question to be examined, so does the wargame have a purpose to be addressed. The topic under consideration would determine the key systems to be examined, just as the focus of the wargame determines the core components of the game.

A systems approach would need to identify the key actors within the system. It would have to give them a degree of agency to exercise choice as they move into the future. Within a wargame, the actors are the players. The design of the wargame would determine what the actors could or could not do, from within a range of possibilities open to them. These could be physical limitations – despite how much we want to fly unaided, the laws of physics and the human form prevents us from doing so. These could be organisational limitations – for example, the adherence to the Geneva Convention. These limitations could apply to one set of players, but not another. In the case of the Geneva Convention, one set of players has to respect it, whilst another set of players might not.

A key aspect of a wargame is that the players play against each other. Within a systems approach to the future, we would have determined not only the key actors within the system,

but also the key relationships between the actors. This is akin to the issue of wargame design in determining how the players will play with each other. The combination of agency and choice, with conflict and cooperation, makes the game, a game. These relationships are then bounded into a ruleset for the game which determines how the wargame is played. This is directly analogous to the boundaries of a system. It provides a limit to what we can do and what we cannot do.

It is highly unlikely that a single wargame, if played more than once, will yield the same results each time. This is the result of human agency. If we then allow for changes to the players in the game and how they react to each other, we will be able to derive an even larger set of possible results. If we then allow for a degree of flexibility to the boundaries of the wargame, then we can create yet a larger set of possible results.

The question arises of how we can manage this large number of possible future outcomes. The futures community has developed a number of methods to order the uncertainty. It is to this that we shall now turn.

## Limiting the Possibilities

From the perspective of the present, there are an exceptionally large number of possible futures. Each individual decision in the present has a consequential knock on effect that helps to determine the range of choices available in the future. These choices are made by billions of different actors in the present, as decisions today feedforward into future possibilities. If we are to examine future possible events, we need to bring some form of order to the range of possible events so that we can study them in a structured way.

The futures community has a number of concepts that can be used to assist in this ordering. Of all of the vast range of possible futures, not all of them would be plausible. For example, one possible future could involve the consequences of a significant asteroid strike upon the Earth. Whilst this may lay in the boundaries of possibility, this possible future event is often seen as relatively implausible. For this reason, we tend to discount implausible futures.

We need to note two points about implausible futures. The first is that they are not entirely uninteresting. The category of possible - but implausible – futures is where the wild cards lie. Wild cards are a category of future which have an incredibly low probability of happening, but an extremely large impact if they were to happen. The possibility of an asteroid strike is a case in point. It has a very low chance of happening, but if it were to it could lead to an extinction event.

The second point to note is that the boundary between possible futures and implausible futures is not fixed. It can change over time. For example, in the 1990s, the security futurist Marvin Cetron alerted his principals in Washington to the possibility of recently fuelled aircraft

being flown into tall buildings in the United States. The warnings were discounted as being too implausible to act upon. After 9-11, this boundary of implausibility shifted to account for a threat that was now very plausible. This example highlights why we ought to keep in touch with implausible futures, but it is customary for them to be the subject of a separate study that is added to a main study.

If we return to the plausible futures, there are two further types of future that need to be accounted for. The first, which is more easily recognisable, are the probable futures. These are the futures that we see as most likely to occur. They are strongly linked with trend analysis and horizon scanning but are usually modified to cater for the disruption of the existing trends. They allow for a systems approach to be grafted onto the horizon scanning to yield a richer consideration of the future.

The second type of plausible future is the preferable future. This is the range of futures that we would like to see happening. Preferable futures introduce a normative element to the study of the future. However, it becomes difficult to distinguish between a normative preferable future and just plain wishful thinking. We often see this in wargaming, where the Blue Team are given almost super-human powers, and the Red Team are portrayed as overly inept. It is useful to have an idea of how we would like the future to turn out, but we need to guard against channelling our thinking into making it appear to happen. For this reason, most futures studies concern themselves less with preferable futures than probable futures.

The range of probable futures tends to act as the core of a futures project. However, despite discounting the implausible futures, wild card futures, and normative futures, there are still a very large number of probable futures to be engaged with. If a study is likely to deal successfully with this complexity, another form of refinement needs to be introduced. It is at this point we would normally turn to our systems analysis.

The purpose of a systems approach to the future is to introduce an element of structure to our enquiry. We can do this by identifying a number of generic systems that need to be accounted for. The simplest classification given by futurists is the PEST analysis. The critical Political, Economic, Social, and Technological systems are identified and introduced as variable elements to the future. By itself, it will give us a range of actors – players in terms of a wargame – and a set of relationships that can govern the player's interaction. This needs to be scaled and adapted according to the game in question. For example, in the context of a platoon-based wargame, the bond market may be of limited importance, whilst it may be fairly central to an economic wargame that examines conflict between two or more central banks. We tend to abstract away from, and exclude, those factors that are of minor importance.

As we undertake the process of abstraction, we need to focus more clearly on the key elements that are the subject of our examination. Futurists call these the critical uncertainties.

There may be a number of critical uncertainties to be examined. It is generally helpful to distil these into as few as possible in order to keep the study to manageable proportions. The simplest form of study here would be to distil the issue in question to two key uncertainties and to develop four probable futures using a 2x2 matrix, very similar to the 'Prisoner's Dilemma'. However, the process of distillation can cause important factors to be overlooked and discounted. One way of guarding against that possibility would be to conduct a number of iterations of the scenarios to test for the robustness of the results.

This is something that gaming can easily do. If a wargame acts as a generative vehicle for multiple futures, then playing the wargame multiple times will test the underlying assumptions of the game and provide us with a heat map of results. The heat map would help us to assess the robustness of the results. This process starts by putting the future into the wargame design.

## Putting Futures into Game Design

We need to start with the purpose that the wargame is to serve before we begin to think about inserting a futures approach to the design of a wargame. We need to be clear about the scale and scope of the wargame. For example, a platoon-based wargame will require a different approach to a grand strategic wargame. Equally, a wargame whose game time represents, say, a few days, will require a very different approach to a wargame whose game time represents a few decades. Again, a wargame set in the near future, where most aspects of the game are already evident, will be a very different prospect to one set in the deep future, where very little can be taken as fixed. The determinant of these dimensions will be the question that the wargame is to address. It will also help to shape which systems are to be highlighted and which systems are of lesser importance.

The question of which systems would be better included in a wargame depends largely upon the question that the wargame is to address. If the wargame is to examine the use of financial and monetary instruments to exert state power, then the game is likely to be better delivered as a relatively high level, even abstract, game. If, on the other hand, the wargame is to examine the relative operational degradation of a two-platoon company compared to a three platoon company, then the game is likely to contain a greater degree of granularity when compared to a grand strategic game.

Part of the skill of the wargame designer is to understand the necessary degree of abstraction that a particular game requires, and to then select a game accordingly. For example, in the case cited of the economic wargame, a Committee Game or Matrix Game format might be best to yield some interesting results. Equally, the question of company effectiveness might be better resolved using a more traditional figures game or board game. The point is that the type of game designed is determined by the question to be addressed, which influences the scale and scope of the game in question.

Perhaps this can be best demonstrated by way of an example. Suppose that the question to be addressed concerns the potential for conflict in an unfrozen Arctic Ocean in the second half of the twenty-first century, say, at the year 2070. How would we begin to address that question?

One starting point would be to consider the systems that might have an impact upon that question. The key premise of the study would be that global warming had been sufficient to melt the Arctic ice cap, rendering it largely navigable for a good portion of the year. We might begin by asking what political systems govern the Arctic Ocean, who might have legitimate interests in the navigation of the Arctic Ocean, and what mechanisms of governance may be in place concerning the Arctic Ocean by 2070. We then need to ask ourselves if these would be sufficient to prevent the outbreak of open conflict. If they are, we can end the study. If they are unlikely to be, then we need to continue with our study.

Our next port of call, in the PEST analysis, would be the economic systems governing the Arctic Ocean. We have to ask why it matters from an economic perspective. We may find that the Arctic has significant economic potential for mineral deposits – especially hydrocarbon deposits, as a major trade route in international shipping trade, and as a significant fishery for Europe and North America. These three areas of potential might be mutually exclusive in some areas. For example, hydrocarbon extraction might impact upon the fishery aspect of the Arctic Ocean. This provides an overlay of potential flashpoints that we can add to the political overlay of potential adversaries.

Moving on to the social systems in the PEST analysis, we need to account for the changes in the composition of society by 2070, much of which is evident today through demographic trends, and changes to social attitudes by 2070. For example, we know from demographics that most northern hemisphere nations will be older than they are today. Could that lead to young people being given greater social value? Might that have an impact on an aversion to casualties? We cannot assume that the armed forces of the potential adversaries will have the same social context in 2070 as they do in 2020. We also cannot assume that this differential impact will occur evenly between the potential adversaries. This analysis should give us an overlay of the social system which we can add to the overlay of the political and economic systems.

The final element of our PEST analysis concerns the development of technological systems. It is important here to incorporate models of long-term technological change into this system. One such approach can be found in the work of Carlota Perez, who is very influential in futurist circles. According to the Perez model, the current technological wave – the ICT, or fifth, wave – will have burned itself out by 2050. If so, then the next technological wave, the sixth wave, will be establishing itself by 2070. There is much speculation about the content of the sixth wave, so this is the area in which the greatest degree of imagination can be exercised whilst remaining in

the boundaries of plausible futures. We can expect the technology to be autonomous, remotely controlled, possibly space borne, capital rather than labour intensive, and fairly fast reacting. It could well act at the NBIC (Nano, Bio, Info, and Cognitive) levels. Whatever we decide about the technological systems, they can then be overlaid on top of the political, economic, and social systems.

Once we have a picture of the operational world in which the base question is set, we then need to return to that base question to gain some appreciation of the scale and scope of the wargame. If our question is concerned with naval design, we may choose to produce a fairly granular wargame, possibly a figures game or board game that tries to find some traction in this decision frame. Equally, if the wargame is concerned with where to invest in naval port facilities, then we may like to have a longer time scale to represent the time it takes to build and develop port facilities and the attendant infrastructure. Normally, this would be represented in the turn structure, with the operational world being represented in the rule structure of the game.

Before we finalise the game, we might like to spend a little time thinking about wild card futures. These can yield very interesting results to the game if introduced at the right time. For example, in the case of a geo-strategic level Arctic conflict game, might there be a technology that renders the game moot? What if the development of additive manufacturing (3D and 4D printing) were such that goods were manufactured on demand at the point of consumption? Would we need a trans-Arctic trade route in such circumstances? Ought we to allow this possibility into the wargame? The point here is that at some point towards the design process, we need to determine what are permissible game moves, which, *ipso facto*, makes all other game moves inadmissible.

Whether or not such a game produces results that are convincing is neither here nor there. An unconvincing game can tell us as much about the future as a convincing game if we conduct a rigorous review of why the game is unconvincing. In many ways, that is where the injection of futures into wargame design can be useful. It forces us to identify our conscious and unconscious assumptions, and to subject them to a rigorous challenge.

## Conclusion

The study of the future has a number of techniques that can be incorporated into game design to generate better wargaming scenarios. Trend analysis and horizon scanning are useful techniques to generate near future scenarios. The key element of near-term scenarios is that much of the operational environment is either fixed, or can be determined relatively easily. For example, when considering near term scenarios, it is relatively easy to determine who the near-term potential adversaries might be. In many ways, we are describing the world in which we currently live, only a bit further into the future.

When looking at far term scenarios, it would be more appropriate to use a form of systems analysis and modelling. By definition, far term scenarios are those in which many of the operational elements are not fixed. To continue the example, above, when considering far term scenarios, the wargame designer would have to give careful consideration to who the potential adversaries might be. We cannot assume that the current range of nations, with their current territorial limits, will not have changed in the longer term. To place a sharp point here, can we assume, in 2070, that China will not have expanded or contracted in territorial terms? Could the United States have expanded to include parts of Canada? Would Europe be a federated superstate or a collection of squabbling minor powers? When designing a wargame for 2070, the designer would have to give some consideration to how these questions could be answered.

The answers to these questions, in the far term wargame, would be written into the fabric of the game. It would help to determine the identity of the players, the scope of their operation, and the boundaries within which they have to operate. In determining these issues, the wargame designer would have to confront the assumptions, which are often tacit, that are being brought into the game structure. It is by confronting these assumptions that we reduce the possibility of being blindsided by an emerging future that we hadn't previously considered. In that sense, we would become better equipped to deal with an emerging future. And that is how futuring can be used to generate better wargame scenarios.

## References

Gordon, A. 2008. "Future Savvy: Identifying Trends to Make Better Decisions, Manage Uncertainty, and Profit from Change", Amacom.

Hines, A. & Bishop, P. 2015. "Thinking about the Future: Guidelines for Strategic Foresight", Hinesight.

Lustig, P. 2015. "Strategic Foresight: Learning from the Future", Triarchy Press.

Millett, S. 2011. "Managing the Future: A Guide to Forecasting and Strategic Planning in the 21st Century", Triarchy Press.

Schwartz, P. 1997. "The Art of the Long View: Planning for the Future in an Uncertain World", Wiley.

Van Der Heijden, K. 2005. "Scenarios: The Art of Strategic Conversation", Wiley.

## About the Author

**Stephen Aguilar-Millan** is the Director of Research of the European Futures Observatory, a not-for-profit foresight research institute based in the United Kingdom. Stephen's research interests are the future of the global economy and future geopolitics. His gaming specialisation is financial and economic warfare.

**Disclaimer**: All ideas and opinions expressed in this article are of the author alone and do not reflect the opinions of any other institution or organization.