
PRODUCTS AND FORESIGHT METHODS IN NATIONAL SECURITY

Răzvan GRIGORAȘ

National Defense University "Carol I", Bucharest

Abstract: *This paper has the aim of describing the main methods which are used to foresee some patterns in the field of security. One starts to analyse the field of foresight by pointing the 3 type of foresight products which are used in the field of security: estimations, predictions and scenarios. One argues that the state of security is described by five types of variables (military, economic, politic, social and ecologic). These elements could indicate us through a scientific approach if the insecurity is inherent, with one of the three products of foresight. The paper mainly refers to Tangredi, Kahn and Schwartz analysis in this field. Finally, the paper tries to emphasize the importance of using neural networks as modelling techniques in security, as a new, original way of discovering the future.*

Keywords: *prediction, foresight, scenario, estimation, security*

1. INTRODUCTION

Nowadays, our sketching image about the international system is generally incomplete, very uncertain and subjective. The future gathers possibilities none of which is certain - so the effort to indicate trajectories the international system may follow into the next period must be a relatively hazardous enterprise. Some would claim it is not even meaningful, but that meaning can be given to future-oriented research on the international system, as well as on any domestic system, if we split the task into three components:

1. Value research - the effort to establish not only basic values of the system, but also the conditions under which they are most likely to be realized.

2. Trend research - the effort to establish trends in the system, based on data from the past, and theories as to how extrapolations should be made.

3. Exploration of relations between trends and values - in other words, efforts to find out whether the trends do or not lead the system into the "promised land": and in case they do, how to reinforce and stabilize them; in case they do not, how to change them.

That means that the future research will shape essentially three main components or aspects, all of them well balanced and interconnected. The brand new element form the research of the future (but not new in the planning process) is the idea of rejecting the splitting of the tasks between ideologists who develop some values, scientists who develop some trends, and of course politicians who try to focus on administration, by a symbiotic approach to the three fields.

A consequence of the upper rejection is the process of nullifying any strict boundary between the values and the trends. Values are not anymore exogenous to the system; but they become a part of the hall system that may rise from the discovery of the new trends. These things happen just as much as the trends are seen as something that should adjust to the existing values. To conclude, we witness the birth of a more symmetric relation between values and trends from this type of approach.

Today we face an environment of increasingly technical background. This environment is essentially the product of globalization. Seen and interpreted in different ways (from good to bad), it remains, in one's view, a fundamental factor of the transformation of the society in one that is based on estimates, forecasts and scenarios.

The military forces, viewed as a natural continuation, responded in time to the needs of security of a state or of an international organization. The effects of globalization had not only allowed innovations in telecommunications but also the security risks to be a phenomenon *passé-par-tout*. The forces will have to meet different challenges of changing environments.

Crisis management paradigm, in terms of decision making, will evolve to scientific projections based on schemes, in order to provide sustainable solutions for development. From the conceptual point of view, the security finds its form and substance in the international scientific research of the Copenhagen School, which today is the widely used model for study. Barry Buzan's and Ole Wæver's dissemination led the security from a military level to a landing containing five levels of analysis (military, political, societal, economic and environmental). The policy of limiting the power and the "Wilson-way" are seen by them as a failure. Focusing only on military matters was a limited way because it was based on a nuclear deterrence version.

Barry Buzan sets a different optical security analysis. He thinks in terms of security threats and vulnerabilities as the basis for its interpretation in this century. Through security, we will therefore understand the threat.

However, Buzan was criticized by McSweeney because he sustained that the security responds the needs of the state and not of the individual.

2. WHAT MEANS FORESEEING?

Following the history of the world, we see that the problem of foresight appeared in ancient times, bringing unrest (from mystical level) to people. The *Sibyls* are the starting point of the unrest. There was a mystical story in the ancient Rome about a mysterious set of nine books which contained a predefined history of the Roman people and some details of all future crises and wars which would happen to them. So, these women were being given the gift of prophecy.

Legends built around them teach us that they were surrounded by supernatural qualities of the gods. The story about their books which were discarded because of their willingness to negotiate with the Romans is the most representative legend about prediction role in Roman society.

The issue of the strategic foresight in the field of security was first analysed in the works of Herman Kahn. He was one of the builders of the strategic foresight. In the book "On Thermonuclear War", the author gave us the opportunity to use his probability-utility model in balancing a number of policy decisions. He uses in the preface the fact that the book was written in a matter that "tried to sink the probability of catastrophe and smoothing the consequences". This is why Kahn begins with some concerns of the probability and the disutility which are related with our life. One agrees that a relative priority could be attached to the "utilities" and to the "disutilities" (as the author names them) in choosing the road for an anxious nation. So a question is born here: is the author more decided to lower the probability of nuclear war, or in to lower its destructive effects? Is he in to the need of lowering the probability of direct attack or in the need of lowering the diplomatic black-mail?

The essence of one's analysis is based on the assumption that the interests remarked are always incompatible, and of course one assumes that they reach some different values for each stake-holder. The author proposes in turns, some of the major policy recommendations which emerge from the upper tome. He tries to focus on three types of deterrence being distinguishable and significant for us.

-Type I deterrence is the deterrence that prevents a direct strategic assault on continental North America.

-Type II deterrence is the deterrence designed in order to prevent or lower extreme provocations -other than direct assault on the United States.

-Type III deterrence- the deterrence which seems to overlap considerably with type II-is intended to restrain the adversary from going beyond certain territorial or weaponry bounds in a limited military conflict.

The author identified six variables (stable, volatile, predictable, incidental, incalculable and binding) which by analysis and operationalization could lead to scenarios and predictions (Kahn, 2000:167). First of all, Herman Kahn defines prediction as “our try to adapt our expectations to a volatile reality, having as foundation a sophisticated setting” (Singer, 2000:203). Its symbiotic nature is heuristic and propaedeutic. Alongside Kahn’s researches one chooses to analyse Peter Schwartz’s model of prediction. This completes into a profound form the art of foresight (Schwartz, 2003:109).

Classifications of foreseeing techniques and methods are provided by Dunn in 2003 and Kleiner in 1996. They group the methods in two categories: methods based on extrapolation and methods based on theoretical prospecting. In the first category, the authors describe the analysis of time series, the estimation of linear trends and the nonlinear time series analysis. In the second category they describe methods and techniques that try to emphasize informed judgments (Delphi technique, cross-impact analysis and technical feasibility).

Estimates, forecasts and scenarios

The methods which are specific to foresee the national security policy are described by Tangredi. He notes that the most important forms of foreseeing are the estimates, the forecasts and scenarios.

Generally, the estimates use a state of current conditions in order to identify part of future events. One concludes that this method is broadly associated with the official estimates from the field of intelligence which are provided by the most important intelligence agencies and services. In the USA the most important are the National Intelligence Estimates (NIEs). They summarize all the assessments which look important for the intelligence community.

These intelligence estimates usually joins the current information on a variety of components (technology achievements, industrial production, military orders) in a comprehensive way which is enough in order to identify the probability of the near-term policies. Nowadays most official intelligence estimates focus most on the capabilities of potential opponents and shy away from discussion of probable intentions.

That happens due the controversies from the Cold War, also by the natural conservatism and bureaucratic pressures for continuous accuracy (Tangredi, 2000: 88).

The second form of foreseeing is represented by the forecast. It gathers a group of longer-range assessments, which are blueprinting on some trends-based analysis.

The special fact about using trends is that it gives credibility to forecasts and least but not last they are issue-specific which means that they are composed under the assumption that a specialized expert is best qualified for making an assessment concerning the continuity or modification of current trends. An interesting fact is that when the forecasts are combined in an attempt doubled by comprehensiveness some variations of the Delphi Method are used.

One agrees that even though the majority of the assessments which are designed today can best be considered forecasts, the term is not preferred by the futurologists who use the scenarios. As Tangredi admits, “the success of the term forecasting is broadly mixed, and it is especially so in the areas which are experiencing some discontinuous change”. The term forecasting has proofs of unreliability because it was wrongly used in order to predict the unrest of the unpredictable. But in the same lines we receive the next idea: “We utter that an organization needs to use the forecasts and also the scenarios”.

The explanation is that forecasting enlightens us how predictable trends may combine in order to produce significant changes in the areas of business. But forecasts are not labelled as such, and we can implicitly use it in every strategic assessment. When we evaluate the validity of any new policy recommendation we have to determine the assumptions and the lines about the future. This gathers sense within the forecast, on which the process is based. The third main form of foreseeing is the scenario. It can be sketch like a range of forecasts, with the construct and the intent a lot more complex.

In the field of security, some scenarios can be blueprint from Herman Kahn’s approach to analysing potential nuclear wars that might occur.

When we talk about the big popularity of scenarios in the field of business planning we have to understand that Pierre Wack applied the concept in Royal Dutch/Shell. From this point of view Wack is often believed to be the sole forecaster of the rise of OPEC and the appearance of the 1970's oil crisis. However, it is known that scenario builders are shaping the fact that their objective is not to foresee a particular future, but to help "decision-makers to take into account all the possible futures."

Also, Peter Schwartz had a significant role in spreading the scenario-modelling in the United States. The upper point of the scenario's development appeared when Wack changed the meaning of the scenario from the tool used for developing simple tales of possible futures to description with "full ramifications" which are designed to change and modify our leaders' view of reality.

For this reason the modern scenarios strive to some developed depictions of alternatives based on some possible changes in the current trends. As the author tries to resume: "The result of the scenario is not a frame of tomorrow, but a tool which could give better decisions for the future." We understand now the difference between scenarios and forecasting. The second term attempts to offer an accurate and predictive future.

The technique used for scenario building has become professional. Nowadays it gathers groups of experts from different subjects. Its initial steps are made by the drivers that will operate the future change. The operating drivers represent important factors in current trends. These factors are the population growth or decline, the technological development, the technological diffusion, the human factors.

To summarize, a scenario is a depiction from future which is based on some chosen directions from drivers. Being taken into consideration the multiple directions which are possible for multiple drivers, one agrees that could find a large number of scenarios required to depict all plausible future. In the same time as like theories, and opposite to predictions, the scenarios are not right or wrong.

They could only be plausible or implausible (Washburn, 1978: 96). The scenarios are used with an increasingly trend by the defence planners in order to grow the number of alternatives correspondent with the traditional military planning process.

Some practical examples used to apply the theoretical elements are shown in the report "Mapping the Global Future" (Report of the National Intelligence Council's 2020). This report appeared in 2004 and was based on a selection and a symbiosis of several techniques and scenarios. It was developed as a concrete useful foresee for the decision makers from the field of security. U.S. continues to surprise us in the field of applied foresee in security. Along with the previous report, we have to mention here the *Global Trends 2025: A transformed world started* in the late of 2008 under the coordination of NIC. To create these reports there were created some extensive working groups who composed dozens of scenarios, and finally were chosen the most significant. They are a great example of the crucible for global scientific research.

3. NEURAL NETWORKING

When we look the upper methods we agree that the applied foresight in security is new as holist concept. The evolved methods in science and the security have to come into the line. In order to treat this difference, one proposes a new way of shaping the future based on the usage of the neural networks and on the black-swam concept.

When one outlines the field of neural networks in scientific research is necessary to establish the motivational occurrence of the concept. In its case the experience shows the facts. The complex managerial problems faced a long time two things: either they are too large for a rigorous mathematical formalization and solution algorithm is too complicated and too complex or they are too costly to be implemented through optimization and simulation techniques.

To overcome these difficulties, they were used several alternative solutions based on artificial intelligence—a term designating a branch of informatics oriented through the implementation of the logic properties which are similar to the human intellect on the computer.

Neural networks (“Artificial neural networks”) appear as a smart solution that can be used as a last resort when other methods are inapplicable to develop computer assistance due to the poor structuring of the decision. The most important references related to neural modelling are made by Rendez-Tanali, Irmak and Abdul-Hamid, Husein in 2011 (Rendez-Tanali, 2011:100-103). Furthermore, the frame built for the information systems to assist data-driven decision is made by Newman in “The Structure and Function of Complex Networks”. Analysing the research field one sees that the problem of applying neural networks in international relations was debated in a primary form by scientists from Harvard University and Georgetown University.

Supporters (Nathaniel Beck, Gary King, Zeng Langche, 2004; pp.30-39) argue that the use of neural networks in the conflict is a few-limited solution. They show that their theoretical conjecture about international conflict is functional. They blueprint that the group of de Marchi agrees with their main methodological points and that the out-of-sample foresight performance is to be a basic standard designed to evaluate all international conflict studies. They try to demonstrate that all other methodological conclusions drawn by de the group of Marchi, Gelpi, and Grynaviski are false. The first example is that when it is used the same evaluative criterion for the models, it is very easy to see that the specified logit models really don’t outperform neural network.

Of course, it is shown that flexibility of the neural network models are able to reach important empirical relations drawn between democracy and conflict which aren’t seen with other means. That is an idea that is interesting since the classical models have more limits than the neural network model (Nathaniel Beck, Gary King, Langche Zeng, 2000: pp. 20-29).

On the other hand, a group of researchers (Scott De Marchi, Christopher Gelpi, Jeffrey D. Grynaviski, 2004: 40-49) argues that neural modelling is not mature enough to solve predictions. Despite important strengths in the field of neural networking, they take issue of three main aspects of the research. First of all, there is the substance of the logical model which is compared to the neural network. Second of all the standards they use for assessing forecasts, and least but not last the theoretical and model building implications of the nonparametric approach represented by neural networks. They replicate and extend the main analysis by estimating a more complete logical model and compare it both to a neural network and to a linear discriminant analysis. Their work reveals that neural networks do not perform mainly better than either model or the linear discriminant estimators. Given this result, they argue that more traditional approaches should be relied upon due to their enhanced ability to test hypotheses.

The second main component which one argues to be included in the prediction instrument is the black-swan concept. Reinvented by N. Taleb (Taleb, 2008:10-15) the black-swan concept refers to the importance of the unpredictable events. One agrees with the idea that there are events which could not be predicted and through their impact could influence the foresight product. So, in order to develop a functional instrument for improving the estimates and the predictions one chooses to agree with supporting the neural networking doubled by the measurement of the impact of black-swan. Their usage opens a new age in the field of predictions. That is happening because the neural model offers us the possibility of learning. It means that as long as the mode roles it will correct its errors and become more accurate. This accuracy will be increased by the identification of the black-swan and the programs developed with the purpose of protecting the organization in front of the unwanted black-swan.

4. CONCLUSION

One concludes that the neural network is a feasible solution for estimating and predicting the state of security. In this article one described the main methods and products of foresight, analyzing the work of H. Kahn and P. Schwartz. Over the upper analysis one agrees that the main methods used in estimates and predictions are limited because of their lack of holist view and of their possibility of reshaping and adapting. The reshaping of the network assures the new model the adaption of the system. The second main prediction component which one agrees to build the model is the usage of blackswam concept. This concept makes the linkage between predictions and scenarios.

REFERENCES

1. Beck N., King G., Zeng L. (2000). *Improving Quantitative Studies of International Conflict: A Conjecture*, The American Political Science Review, Volume 94, No. 1.
2. Kahn H. (2000). *Simulating the Unthinkable: Gaming Future War in the 1950s and 1960s*, Social Studies of Science, Vol. 30, No. 2
3. Irmak R. T., Husein A. H. (2011). *An Assessment of the Benefits of Online Scenario Simulation Tools*, Homeland Security and Emergency Management Education , No. 1
4. Singer J. D. (2000). *The Strategic Dilemma: Probability versus Disutility*, The Journal of Conflict Resolution, Vol. 5, No. 2
5. Schwartz P. (2003). *The Art of the Long View: Planning for the Future in an Uncertain World*
6. Tangredi S. (2000). *All Possible Wars? Toward a Consensus View of the Future Security Environment, 2001–2025*. Washington DC: NDU Publishing House
7. Taber S. C., Timpone J. R. (1996). *Beyond Simplicity: Focused Realism and Computational Modeling in International Relations*, Mershon International Studies Review, Vol 40, No. 1
8. Washburn A. M., Jones T. E. (1978). *Anchoring Futures in Preferences*.
9. Choucri N., Robinson T. W., eds. *Forecasting in International Relations: Theory, Methods, Problems, Prospects*. San Francisco: W.H. Freeman Company