GAMES, EXERCISES AND SIMULATIONS

ALTERNATIVE SCENARIOS IN SECURITY AND INTELLIGENCE STUDIES: METHODS OF IDENTIFICATION AND ANALYSIS OF PROJECTION FACTORS. PROPOSAL OF A CLASS EXERCISE

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Abstract[1]

Forecasting methods are used in different areas, different contexts, but with the same final purpose: evaluating possible futures. Alternative scenarios are an efficient tool of identifying alternative futures, based on past and present actions and contexts.

Since gaining popularity, in the 1950s, the scenario method has been constantly improved and has evolved into different typologies. The qualitative approach of the alternative scenarios method allows for insightful analysis and debate on the topic addressed, based on the projection factors that describe the situation under study. The scenario method can be adapted to different types of situations and to different time-frames. The article discusses various scenario designs and reviews their primary characteristics, sending the reader to further information. Without representing a formal institutional method of analysis, alternative scenarios can successfully be used in processes that target risk assessments and mitigations, tackling vulnerabilities, identifying gaps and needs, anticipating attacks and possible associated tools, but also the elaboration of strategies on a long, medium and short-term.

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This paper proposes a class exercise based on the elaboration of alternative scenarios. As support for both the lecturer, who will act as the moderator, and the students, who will be the participants of the exercise, the article discusses the research method proposed through definitions, characteristics and classifications, advantages and disadvantages, methods of identification and analysis of projection factors, and also the utility of the method for the intelligence and security studies.

Keywords: *alternative scenarios, multiple scenarios, projection factors, key-drivers, security and intelligence studies.*

Alternative scenarios as a research method

What are alternative scenarios?

Alternative scenarios are the result of anticipating different possibilities of the future, by taking into consideration a series of variables. Scenarios are "preparation for potential future challenges, not predictions of what will happen (…) and create plausible views of the future that decision-makers can use to determine their best response and how to react to alternative plays" (Jackson, 2011, p. 24).

Philip van Notten (2005) evaluates that "scenarios are consistent and coherent descriptions of alternative hypothetical futures that reflect different perspectives on past, present, and future developments, which can serve as a basis for action". Scenarios present multiple possible futures, "from the expected to the wildcard, in forms that are analytically coherent and imaginatively engaging", contributing to the elimination of the unexpected turn of events (Bishop, Hines and Collins, 2007, p. 5).

Discussed also as *multiple scenarios*, the method results with alternative possible explanations of possible futures, in the presence of key-drivers of projection factors (Handbook of Analytic Tools and Techniques, 2016).

The definitions mentioned above illustrate a series of characteristics of the scenario method: scenarios are not predictions, they are consistent and coherent descriptions, are based on the reflection on past, present and future developments, they can be used in preparing for possible future challenges and strategic responses.

Philip van Notten (2006) classifies scenarios after "macro" and "micro" characteristics:

- "The goals of scenario studies: Exploration – Pre-policy research", which address "evolutionary" and "discontinuity" changes, through "descriptive" and "normative" values. The goals cover, on one hand, creative thinking, raising awareness, and learning through exploration, and, on the other hand, recommendations for policies or "strategic decision-making". The value of the scenario establishes the type of indicators presented, whether the conditions for a certain aim are presented or if possible outcomes are presented without following a specific goal. Evolutionary changes refer to gradually driven situations, while discontinuity focuses on the "sudden nature of change".
- "Design of the scenario process: Intuitive – Analytical", which employs "participatory" and "model-based" methods. The analytical design is primarily based on computer simulations, often associated with model-based quantification techniques. The intuitive design implies qualitative approaches based on creative techniques.
- "Content of the scenarios: Complex – Simple", which are developed "in chain" or as "snapshots". The complexity of a scenario results through the intersection of processes that determine it, while the simplicity is associated with particular scopes. "Chains" include the process of development, while "snapshots" focus on the end-state of the developments.

The scenario method gained popularity with Herman Kahn, in the 1950s, while working at RAND Corporation[2], and, later, with Bright, who promoted scenarios as "tools for contingency planning", focusing on "the benefits of planning for all reasonable outcomes" (Bright, 1978, apud Gentry, Calantone, and Cui, 2006, p. 58).

The method can be successfully used in cases such as: exploring possibilities, identifying risks and opportunities, identifying possible improvements, planning future actions, developing new strategies, implementing diagnoses, analyzing implications of different challenges etc. (Jackson, 2011). Multiple scenarios prove to be very useful in understanding the many possible turns of a situation, but also in

[2] A research organization, established in 1948 in USA, which now works in USA, Europe and Australia for strengthening public policies.

anticipating different types of outcomes (Handbook of Analytic Tools and Techniques, 2016).

According to Bright (Bright, 1978 apud Gentry, Calantone, and Cui, 2006, p. 51-52), scenarios are used to analyze "several possible futures with the idea of being prepared for any uncertainty". The scenario method is placed by Gentry, Calantone, and Cui (2006) under the general umbrella of *scripts*, at the intersection of casualty and opinion.

Scenarios are efficient methods in different fields, from foresight analysis, to the development of public policies and decision making in governments, enterprises and organizations (van Notten, 2005). Foresight methodologies represent "frameworks for making sense of data generated by structures processes to think about the future" (Conway, s. a., p. 1), and scenario development is one aspect of this "comprehensive activity" (Bishop, Hines and Collins, 2007, p. 6). Alternative scenarios have proven to be useful in different domains, either as a single analysis method or as part of a more complex methodology that comprises complementary methods. Therefore, alternative scenarios can contribute to fields such as political, economic, social, foresight, futures studies, strategy work, military intelligence etc. (Kuosa, 2014).

A good scenario "inspires, engages and enables others to take action, breaks people's acceptance of current paradigms and produces plausible outcomes that can be turned into strategic responses" (Jackson, 2011, p. 27). Successful scenarios are associated with a couple of principles: exploring plausible futures, being consistent and based on rigorous data, and being compelling (Foresight Horizon Scanning Centre, 2009). As such, efficient and useful scenarios use valid data, can determine entities and people to act upon the new information and free themselves from previous certainties, in order to adopt a strategic behavior.

Advantages of using alternative scenarios

Alternative scenarios can contribute to a better and common understanding of possible futures, making better and justified strategic decisions, preventing risks, enabling shared action, and even enforcing

team spirit and collaboration (Jackson, 2011). Also, discussing the scenario planning method in relation to foresight studies, M. Conway highlights the benefit of gathering information external to the subject organization (Conway, s. a.).

The method can lead to understand different possible turn of events, how certain elements can modify certain aspects, which aspects are more prone to change than others, how alternative futures may look like, what can be done to prevent certain types of change, what are the unknown important elements etc. (Jackson, 2011).

By generating alternative scenarios, decision makers can eliminate the element of surprise in possible turn of events (Handbook of Analytic Tools and Techniques, 2016). Although, this can be achieved within certain limits, as different factors can determine different results.

"The true value of the technique is to provide a palette of ideas from which attention-deserving themes can be developed" (Handbook of Analytic Tools and Techniques, 2016, p. 35). Thus, the method[3] implies a process if identifying possible relevant themes to be addressed and further analyzed.

Disadvantages of using alternative scenarios

The method can be subject to lack of credibility, subjectivism, or errors. Also, because alternative scenarios cannot be validated, and can be impacted by cultural variables, their results are placed under suspicion. At the same time, the high amount of resources in terms of time and money implied contributes to the negative evaluation of using such a method. (Jackson, 2011)

The scenario method presents the risk of being labeled as irrelevant (Conway, s. a.) if the process is not clearly stated within a more expansive analysis, as, for example, an organizational diagnosis or a strategic development plan.

[3] This study differentiates the term "method" (understood as steps to be followed) from "technique" (understood as how the steps will be implemented) (according to the clarifications of Bishop, Hines and Collins, 2007).

Methods of identification and analysis of projection factors

Alternative scenarios are formally projected in a workshop setting, using both deductive and inductive approaches, tackling with the imagination of the participants, who are experts in the addressed field. The experts have the role of identifying the key-drivers, which are elements with possible impact over the analyzed theme (Handbook of Analytic Tools and Techniques, 2016). The identification of such elements can be assimilated to the process of identifying indicators. "Indicators are observable phenomena that are periodically reviewed to track events, spot emerging trends, validate a hypothesis, and warn of anticipated change" (Pherson, 2018, p. 1). As such, observed phenomena are converted into analysis indicators, which need continuous updating to the reality, by tracking events, trends, changes, which can provide insight into anticipating future events, but also can confirm previous identified scenarios.

Philip van Notten (2006) describes the design process through analytical and intuitive approaches. The first type of approach, the analytical one, includes the model-based technique, which refers to computer simulations, and other quantification procedures. Another analytical technique is desk research, implemented through document analysis. The intuitive approach includes participatory, more creative techniques, as, for example, the elaboration of stories. The intuitive approach is based on four steps: "a) identification of subject or problem area; b) description of relevant factors; c) prioritization and selection of relevant factors; d) the creation of scenarios. A subsequent step might be scenario evaluation as pre-policy research." (van Notten, 2006). Intuitive and analytical approaches can successfully be combined, for a more in-depth analysis.

Bishop, Hines and Collins (2007) discuss different categories of scenarios, each described through scenario techniques. Among the analyzed categories, the authors present *the Royal Dutch Shell technique*, or *Global Business Network (GBN)*, created by Pierre Wack in the 1970s. The technique reflects a two-dimensional matrix, presenting "two dimensions of uncertainty or polarities" (Bishop, Hines and Collins, 2007, p. 14). Börjeson (Börjeson et al., in press apud Bishop, Hines and Collins, 2007, p. 10) identifies three categories of scenarios:

predictive – analyzing "What will happen?", exploratory – analyzing "What can happen?", and normative – analyzing "How can a specific target be reached?". A normative design implies the establishment of visions and norms, followed by the explanation of possible outcomes, without connecting the storyline to data or historical events (Kuosa, 2014). On the other hand, explorative designs analyze what is possible to happen, even if it does not include the desired outcomes, and the scenarios resulted must be based on empirical data and on a logical temporal path, starting from past events (Kuosa, 2014).

The alternative scenarios development can include a Delphi process, which focuses on identifying consensus and disapproval within the working group with reference to the topic addressed. The process allows for individual inputs on scenario dimensions, followed by a process of agreeing on key-drivers resulted. (Wright, G. et al., 2013)

The basic stages for generating scenarios include (Handbook of Analytic Tools and Techniques, 2016):

- identifying the main issue to be addressed by involving experts in the field;
- identifying the factors that may have an impact over the situation and out of them identifying the key-drivers;
- establishing the limits of the key-drivers;
- grouping the drivers in 2x2 pairs;
- developing a story for each quadrant formed by the 2x2 pairs;
- selecting the scenarios to be further analyzed on the premises of "illustrating compelling and challenging futures not now being considered" (Handbook of Analytic Tools and Techniques, 2016, p. 35);
- elaborating indicators suitable for tracking the development of the scenarios(s). (Handbook of Analytic Tools and Techniques, 2016)

Jackson, (2011) recommends certain steps in order to obtain efficient results when developing scenarios:

- clearly specifying the theme that is to be addressed;
- identifying the major elements that may have an impact over the identified theme;
- establishing the way these elements interact with each other and extract the ones with the estimated higher impact;

- imagining possible futures starting from the interaction of the selected elements;
- deciding which interaction needs to be evaluated through alternative scenarios method;
- identifying key-variables that define the certain interactions;
- allocating descriptive short titles for each scenario;
- establishing the period of time that is needed to be evaluated for each scenario;
- organizing the workshop settings with the participants and discuss the key-variables, projected over the required period of time (short/ medium/ long term);
- making sure the scenarios resulted are anchored into the reality and are plausible. (Jackson, 2011)

Foresight Horizon Scanning Centre (2009) proposes a checklist of issues as a previous step to the development of scenarios:

- verifying the clarity of the exercise's purpose, by discussing with the stakeholders;
- anticipating the usefulness of the results;
- defining the time-frame of the scenarios, in accordance to the topic addressed: 3-5 years for situations dependent on short-term available factors, more than 5 years when analyzing long-lasting situations;
- describing the characteristics of the participants in terms of expertise and backgrounds, including characteristics of the beneficiary categories;
- exploring the interests of the possible beneficiaries of the results;
- establishing the methodology of development and how the results will be disseminated: giving names to the resulted scenarios in accordance to their main characteristics, elaborating visual diagrams, developing stories, identifying catchy headlines for the scenarios, presenting video formats of the scenarios etc. (Foresight Horizon Scanning Centre (2009)

In the construction of alternative scenarios, it is recommended to use a quadrant-based model, which will result with four possible potential futures: "one can only be considered a forecast, two would

most likely limit competing uncertainties and three may cause people to assume one is the forecast", while more than four may imply the use of a morphological analysis method (Jackson, 2011, p. 26). The "two-dimensional matrix" is based on the selection of two factors that are considered to have the most impact on the topic addressed (van Notten, 2006). The selection can follow "the backbone approach" (when the relationship between the two factors rely on a particular theory), "the foundation approach" (when the factors are selected in relation to their impact over the future of the topic addressed), "the scaffolding approach" (which results with more elaborated scenarios, that don't fit into the structure any more), and "the shop window approach" (which results with clear different scenarios) (Van't Klooster and van Asselt, 2006 apud van Notten, 2006). These approaches of elaborating scenarios are also called "deductive", referring to the framework on which scenarios are based on (Van der Heijden, 1996 apud van Notten, 2006). "Inductive" approaches are methods of elaborating scenarios in contrast with the deductive ones. These methods don't rely on a structure for the scenarios. Instead, they imply associations, storylines etc. (Van der Heijden, 1996 apud van Notten, 2006).

Foresight Horizon Scanning Centre (2009) presents three possibilities of developing scenarios that were used by the UK government. The "two-axes method" results are considered rather illustrative, being more suited for medium and long-term situations (10-20 years). The "branch analysis" is recommended for short-term events (maximum 5 years); it starts from a main question and it defines sequenced possible events and their potential outcomes. The "cone of plausibility" presents the possible impact of drivers on final outcomes, being suited for very short-term events (2-3 months) with a limited number of drivers, but also for long-term situations; it relies on the identification of key-drivers and on the adjustment of assumptions afferent to each driver (Foresight Horizon Scanning Centre, 2009). Habegger (2009) distinguishes between four types of futures, as part of the "futures cone" technique: "possible futures" (futures resulted from imagination), "plausible futures" (futures in line with current knowledge), "probable futures" (futures connected to the present and

the past), and "preferable futures" (representing the desired futures) (Habegger, 2009, p. 11).

Timing is an important aspect to consider when organizing scenario projects. There are certain types of situations when the method might not have a positive impact, for example: during chaotic times, during times of internal competitions or noise-producing actions, or after decisions have already been made. (Jackson, 2011).

Using alternative scenarios in security and intelligence studies

Alternative scenarios can be used as a research method in instances such as identifying (new) vulnerabilities, possible attacks, and possible attack methods (Handbook of Analytic Tools and Techniques, 2016, p. 35). In intelligence and security studies, indicators are useful in analyzing possible futures, and "often described as estimative, predictive, or foresight indicators" (Pherson, 2018, p. 1). These types of indicators that are often used together with alternative scenarios are called *estimative*. Estimative indicators can measure change, can be used to "monitor, detect, or evaluate change over time" (Pherson, 2018, p. 7). Estimative indicators refer to future events, may be sustained by historical similar outcomes, can make extrapolations, and are usually qualitative (Pherson, 2018). A subset of the estimative indicators consists of *warning indicators*, which "provide advanced early warning of undesirable events" and are "often used to determine an alert or threat level" (Pherson, 2018, p. 8).

The method can successfully be used in analyzing security threats and in preventing the associated risks. Kim and Cha (2011) describe scenarios as a qualitative security risk analysis (SRA) useful in analyzing "possible future events (…) providing future strategies and appropriate countermeasures" (Kim and Cha, 2011, p. 293). SRA is defined as "a proactive approach that can identify and assess accident risks before they cause major losses", which includes three stages: 1) defining the scope, boundaries and methodology, 2) developing the risk analysis and 3) implementing a risk mitigation and evaluation process (Kim and Cha, 2011, p. 293, 2094). Kim and Cha (2011) propose the updating of the scenario method to the Unified Modeling Language

(UML) use cases, which focuses on identifying security issues before implementing a risk analysis and proposing countermeasures.

Class exercise: identifying projection factors and elaborating alternative scenarios using "the two-axis method"

The following exercise proposes the practice of the elaboration of alternative scenarios in relation to a pre-selected topic. The exercise starts from the hypothesis that the participants were previously presented the method of generating alternative scenarios, including their advantages, disadvantages, and utility.

The exercise implies the presence of a moderator and the participation of minimum 4 students; the students/ participants will have had access to information regarding the topic of the exercise.

Resources needed:

- paper and pens for each group of participants;
- flipchart and colored markers;
- projector and laptop (if possible), for presenting the information used in the exercise: topic, scheme, steps to follow.

Proposal of topic *(the topic will be changed in accordance to the aim of the exercise)*: Elaborate alternative scenarios in order to address the following topic: *What elements can determine the development of violent extremism manifestations with tendencies of terrorism, in Romania? Please, refer to the following 10 years.*

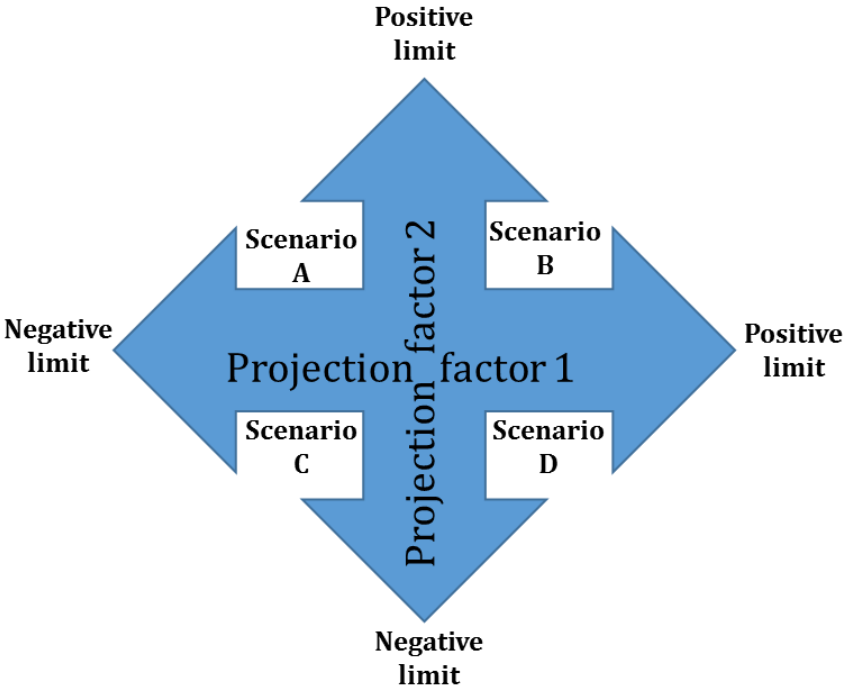

Figure 1. Schematic structure for elaborating alternative scenarios[4]

Methodology

Instructions for the moderator:

1. group the participants into groups of 3-4;
2. hand the groups pens and paper;
3. present the topic/write it down on the flipchart, so the participants can read it whenever they need to;

[4] Source: Author's elaboration, adapted after Handbook of Analytic Tools and Techniques. (2016); Watts, J., Jensen, B., Work J.D., Whyte, Ch. and Kollars, N. (September, 2019); van Notten, Ph. (2006); Foresight Horizon Scanning Centre (October, 2009).

4. draw/present the schematic structure for elaborating alternative scenarios, so the participants can look at it whenever they need to (see Figure 1);

5. present/ write down the steps for elaborating alternative scenarios (described below), so the participants can read it whenever they need to;

i. present each step one by one and ask each group to delegate representatives who will present the results orally;

ii. present the time allotted for each step and monitor the time;

6. move around the classroom, so you make sure that all the students participate, and encourage all the students to participate;

7. ask the students to discuss the results after each step.

If the format of the gathering with the participants allows the implementation of the exercise over a longer period of time:

8. establish the period of time for monitoring the scenarios;

9. organize a new workshop with the same participants, after the established period of time, and discuss the development of each selected scenario.

Steps to be followed by the participants:

1. identify the main elements that define violent extremism manifestations with tendencies of terrorism, by using the information gathered during your theoretical study and by referring to expressed views of practitioners and experts in the field (e.g. expressed in articles, interviews, presentations etc.); write them down;

2. each group's representative presents the results and all the participants discuss it with the purpose of agreeing on including it in the exercise; the results will be presented on flipchart pages;

3. out of the identified elements select projection factors/ key-drivers that may have an impact over the violent extremism manifestations with tendencies of terrorism in Romania, during the next 3 years;

i. select the projection factors with the estimated higher impact over the situation addressed;

4. each group's representative presents the results and all the participants discuss it with the purpose of agreeing on including the projection factors in the exercise; the results will be presented on flipchart pages;

5. all the participants will group the selected projection factors that also interact with each-other, so they can form 2x2 pairs; the results will be presented on flipchart pages;

6. all the participants will establish the limits of the projection factors and a representative will place them on a scheme (see Figure 1);

7. in groups, develop and describe possible futures resulted from the interaction of each pair of projection factors, by referring to each quadrant in the scheme (see Figure 1);

- each group will be analyzing the intersection of one pair of projection factors (if more pairs than groups resulted, the groups will select the factors by preference, without overlapping with other group; if less pairs than groups resulted, the groups will select the factors by preference, even though they overlap with other group);
- name each of the four scenarios resulted;
- describe the implications of each scenario from different perspective: social, cultural, economic, political etc.;
- select the scenarios to be further analyzed, in accordance to their plausibility and to the relevance for the situation studied;
- elaborate indicators relevant for monitoring the selected scenarios;

8. each group's representative presents the results and all the participants discuss it.

Conclusions

The identification of possible alternative scenarios can overcome the uncertainty of the future, through the advantage given by the possibility of monitoring the development of a certain situation with the identified projection factors or key-drivers. As such, the alternative scenarios method may contribute to the elimination of the element of surprise and unexpected turn of events. Among the most efficient uses

of the method are strategic planning and early warning on possible outcomes. However, projection factors or key-drivers can contribute to the identification of trajectories, but the development of the monitored situation is dependent on the trend of different events. Therefore, alternative scenarios can explore possible futures in relation to certain impact factors, resulting with examples of outcomes. The qualitative approach of the alternative scenarios method allows for insightful analysis and debate on the topic addressed, based on the projection factors that describe the situation under study. The scenario method can be adapted to different types of situations and to different time-frames. Without representing a formal institutional method of analysis, alternative scenarios can successfully be used in processes that target risk assessments and mitigations, tackling vulnerabilities, identifying gaps and needs, anticipating attacks and possible associated tools, but also the elaboration of strategies on a long, medium and short-term.

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