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ALTERNATE FUTURES SCENARIO PLANNING

by

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## **ABSTRACT**

Analysis of the future is a difficult proposition, but necessary in order to develop rational and robust force structure and military strategy. In order to reduce the difficulty inherent in futures analysis, it is useful to develop processes for doing so. Arguably, futures analysis is best conducted through the development of alternate futures scenarios against which the value of long range planning decisions can be judged. There are numerous methods of development of alternate future scenarios; each has its own merits and flaws. This paper examines two of these models, a linear projection and a quadrant model (sub-set of orthogonal projection), and argues that the latter is generally more useful and less biased. It also outlines a process that DND/CF planners could use to create these models and facilitate their thinking about the future. This process is based upon the model used by ADM (HR-Mil) staff in developing the alternate futures scenarios used in support of HR Strategy 2020.

## **RÉSUMÉ**

L'analyse prospective constitue une tâche difficile mais néanmoins nécessaire à la création d'une structure de la force et d'une stratégie militaire rationnelles et solides, d'où l'importance d'élaborer des processus visant à faciliter cette analyse. De toute évidence, il est plus efficace d'analyser l'avenir en concevant des scénarios futurs de rechange en fonction desquels on peut évaluer la pertinence des décisions prises en vue d'une planification à long terme. Il existe de nombreuses méthodes permettant d'élaborer de tels scénarios, et chacune d'elles comporte des avantages et des lacunes. Le présent document étudie deux de ces méthodes, l'approche linéaire et la projection orthogonale, et stipule que cette dernière s'avère généralement plus utile et plus exacte que la première. Il explique également les grandes lignes d'un processus que les planificateurs de la Défense nationale et des Forces canadiennes pourraient utiliser pour concevoir leurs scénarios et faciliter leur analyse du futur. Le processus repose sur le modèle employé par le personnel du Sous-ministre adjoint (Ressources humaines - Militaires) pour mettre au point les scénarios futurs de rechange servant à appuyer la Stratégie 2020 des HR.

## **ALTERNATE FUTURES SCENARIO PLANNING**

### **INTRODUCTION**

1. In the process of strategic planning one of the crucial early functions is the determination of the environment the strategy will likely operate in. Understanding the possible environment with which the strategy must cope will enable an appreciation of potential threats and opportunities. This in turn will permit the development of the strategy best suited to meet the challenges posed by these threats. Understanding the range of possible future outcomes can be facilitated through the development of Alternate Futures Scenarios (AFS). In addition to their utility in developing long-term strategies, the AFS are useful in wind-tunneling potential strategic, operational, and tactical contingency plans. They are essential to managing risk when developing future courses of action. Another use for the scenarios is to flag key events which, should they come to pass, will provide an indicator of the evolution of a particular scenario. This in turn will permit the implementation of strategy or contingency plans devised to meet the demands of the particular future. The challenge for planners is to develop credible, rigorous, and useful scenarios to assist the planning process.

2. Determining probable or possible future events with precision is a challenging task made more difficult by the volatility, complexity, uncertainty, and ambiguity of the world. The rate of change is faster now than at any time in history and is accelerating quickly. Hence, caution must be taken when developing scenario sets to avoid thinking too narrowly about the future. No plausible eventuality should be ruled out. Moreover, the desire to choose one future as the litmus test for planning and strategic thinking is a pitfall to be avoided. The future could transpire in accordance with the selected version, however it is more likely that the future will evolve with elements from each of the alternate futures scenarios. The key to maximizing the utility of the scenario sets then is to test all of the possible strategies against each scenario to determine the one which performs best in all of the futures.

3. An examination of different alternate future scenario planning methodologies is valuable for defence planners in that it will allow them to determine which methods best suit a given problem. Moreover, establishing a departmental “standard” will add rigour to the work conducted by the various planning organizations within the Department of National Defence/Canadian Forces (DND/CF). One of the criticisms of DND/CF long term planning is that it has lacked coherence in the past. Adoption of a standard for alternate futures analysis will rectify this identified shortfall.

### **WHAT ARE SCENARIOS?**

4. The term “scenario” has different meanings depending on the audience. Currently, within the CF, the Force Planning Scenarios (FPS) are used to:

- a. assess risk;
- b. describe operational considerations, resource requirements, and other influencing factors; and
- c. rationalize capability requirements.

The eleven scenarios currently in use span the spectrum of conflict and operations envisioned for the CF. As their name implies, the FPS are aimed at evaluating force structure options and not to assist in determining a strategic path for the CF.

5. A strategic level scenario can be described as a “possible view of the world, providing a context in which managers can make decisions. By seeing a range of possible worlds, decisions will be better informed, and a strategy based on this knowledge and insight will be more likely to succeed. Scenarios may not predict the future, but they illuminate the drivers of change...”<sup>1</sup> Hence, alternate future scenarios are not intended to be predictive models, rather possible future outcomes. It is important to remember that in the strategic planning process scenarios are a means to an end, not an end themselves. The end is the decisions facilitated by the scenarios.

6. To determine a range of plausible future events, which might impact national security it is important to methodically and rigorously analyze the future security environment. The aim is to develop an understanding of how the future might possibly unfold, rather than decide upon firm predictions of future events. In essence, the scenarios, or models, must stimulate the development of a group of reasonably possible alternate futures. This methodology is useful not only for military planners but also has significant private sector applicability.<sup>2</sup> Once these are developed they can be used to measure the validity of current strategy or develop new strategy.<sup>3</sup>

7. Opponents of this approach might argue that it is better to pick the most probable future and frame decisions around it. This is however a reckless exercise. The future is too uncertain to facilitate accurate predictions.<sup>4</sup> As J.C. Wylie observed, “...planning for certitude is the greatest of all military mistakes...”<sup>5</sup>

## **SCENARIO VALUE**

8. Scenario planning is a useful risk management tool. Identification of event indicators is part of the scenario-building process. These indicators will help to

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<sup>1</sup> Gill Ringland, Scenarios in Business. (West Sussex, UK: John Wiley & Sons Ltd., 2002) p.2.

<sup>2</sup> Peter Schwartz, The Art of the Long View – Planning for the Future in an Uncertain World. (New York: Double Day, 1996) p. 104-105.

<sup>3</sup> Liam Fahey and Robert M. Randall, “What is Scenario Learning?” Learning from the Future – Competitive Foresight Scenarios. Edited by Liam Fahey and Robert M. Randall (New York: John Wiley & Sons, Inc., 1998). p. 14-18.

<sup>4</sup> Colin S. Gray, Modern Strategy. (Oxford: Oxford University Press, 1999) p. 161-162.

<sup>5</sup> J.C. Wylie, Military Strategy: A General Theory of Power Control. (New York: Rutgers University Press, 1967) p. 85.

determine which future is transpiring. This in turn permits the implementation of contingencies that have been devised through the alternate futures process. The end result is a proactive management environment vice a reactive “crisis management” style.<sup>6</sup> The ability to catalogue, monitor, and react to indicators provides organizations with a useful risk management framework.

9. Scenarios foster a clearer understanding of current events by imagining their future outcomes. This permits the identification of change earlier than might otherwise be the case. Moreover, scenarios are useful tools to assess existing strategy and plans and to develop and assess options.<sup>7</sup> Again, they aid risk management by identifying the manner in which events might unfold and permitting options analysis.

10. Another advantage of alternate futures scenarios is that they can help broaden thinking. Organizations risk “group-think” and often fail to recognize “that possibilities are influenced by a wide range of people and that many views of the world are different from our own.”<sup>8</sup> Scenarios can potentially challenge this “group-think” and permit a broader appreciation of future possibilities than linear projection models (see below). To accomplish this, scenario development must be undertaken within an intellectually permissive environment.

11. Scenarios can be used in conjunction with other decision techniques, such as Strength, Weakness, Opportunity, and Threat (SWOT) analysis to enable better decision-making. In this case, strategies to address the challenges identified in the alternate futures can be devised and then validated through SWOT analysis. The Strategy 2020 development process followed this methodology in the SWOT analysis of the Benign, Malign, and Base Case alternate futures.

## **METHODOLOGIES**

12. The process for determining the future security environment should result in a range of possible outcomes and thereby permit the development of strategy and capabilities to address them. There are no set rules as to how an organization might develop scenarios; however, there are public and private sector models available to provide guidance for DND/CF scenario development. For the purposes of this paper, two models will be examined, a linear model and a quadrant model. These are traditional methods for engaging in alternate futures planning exercises therefore they bear examination for defence planning purposes. While there are similarities between the two

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<sup>6</sup> Fahey and Randall, “Integrating Strategy and Scenarios,” *Learning from the Future – Competitive Foresight Scenarios*. p. 29-32.

<sup>7</sup> Ringland, *Scenarios in Business*. p. 3-4.

<sup>8</sup> Ged Davis, “Creating Scenarios for your Company’s Future,” The 1998 Conference on Corporate Environmental, Health, and Safety Excellence *Bringing Sustainable Development Down to Earth* New York City – 28 April 1998. Taken from [www.Shell.com](http://www.Shell.com).

models as shall be revealed below, the quadrant methodology increases the level or rigour without dramatically increasing the complexity.

13. There are several other computer-based models available to defence planners to determine probabilities of events occurring. Since they are computer-based models some analysts consider them more rigorous than the quadrant or linear models. However, it is an unrealistic comparison in that the computer-based models are, as noted, designed to predict probabilities of future events occurring. Alternate futures scenario planning helps analysts to determine what exactly these events might be. Hence, examination of computer based models and simulations is outside of the scope of this paper.

### **LINEAR MODEL**

14. One method of creating scenarios is to postulate the likely outcome of events occurring today and forecast out to the desired period of analysis. The forward development of the expected outcome of current trends forms the “Base Case.” The base case is an evolutionary product of the *status quo*. Upon establishing a Base Case a more optimistic and a more pessimistic analysis of the outcomes of the trends can be conducted. These will form the Benign Case and Malign Case of alternate futures respectively. Given that trends have essentially four ways to transpire; better than anticipated, worse than anticipated, as anticipated, or an amalgam of the scenarios, it follows that a practical form of analysis is the Base, Malign, and Benign Case.<sup>9</sup> As noted above, this was the type of model chosen for the development of alternate futures used in the development of Strategy 2020.

15. While the preceding model is useful it suffers from some limitations. Primarily, given that it is a linear projection of current trends it could be more accurately described as a forecast than a scenario projection. Forecasting is more susceptible to “group-think” and likely to be overly dominated by cultural bias than a more structured scenario model.<sup>10</sup> For short-term planning, Horizon 1 for example, forecasting is more useful and potentially more accurate. Moving out past the Horizon 1 timeframe introduces more uncertainty and more opportunity for unanticipated variables to influence outcomes. Hence forecasting should not be considered an optimal approach for long-term planning. A more structured approach to scenario development would minimize the shortfalls of the linear model.

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<sup>9</sup> Zalmay Khalilzad and Ian O. Lesser (eds), Sources of Conflict in the 21<sup>st</sup> Century: Regional Futures and US Strategy. MR-897-AF, (Santa Monica, CA: RAND Corporation, 1988) p 7-10.

<sup>10</sup> Davis, “Creating Scenarios for your Company’s Future.”

## **NON-LINEAR MODEL**

16. There are also many non-linear approaches to alternate future scenario development. The following model is derived from a scenario workshop conducted for DSHRC by Global Business Network Canada in January 2002, which devised scenarios relevant to human resource (HR) planning up to 2020. These scenarios are detailed in HR Strategy 2020.<sup>11</sup> The process undertaken during this workshop was an eight-step method to develop a four-quadrant orthographic projection of alternate futures. The steps are as follows:

- a. Identify the Focal Issue. eg. Will the CF be relevant in 2025?;
- b. Review Past Changes. e.g. Sweeping technological innovation;
- c. Identify Future Changes, Factors, and Forces. e.g. The end of the oil age;
- d. Identify the Critical Uncertainties (the axes). e.g. Level of technological change and Frequency of Conflict;
- e. Develop Scenario Logics. e.g. Significant change with high frequency of conflict, Low level of change with low frequency of conflict etc.;
- f. Scenario Development – characteristics and timelines. See paragraphs 28-30;
- g. Analyze the Implications. See paragraph 31; and
- h. Identify the Indicators. See paragraph 32.

### **Focal Issue**

17. Successful military leaders adhere to the principle of proper selection and maintenance of the aim in planning and conducting operations. So too must alternate future planners since the development of good scenarios requires the maintenance of focus. Without this focus, scenarios are of less value in assisting the development and validation of strategic options. The focal issue provides planners with a central aim for the scenario development process. The issue must focus on the organization and identify the key strategic uncertainty. As the name implies, there can only be one focal issue.

18. There are various methods to determine the focal issue for scenario development. One method is through a brainstorming session with the scenario team. Another is to interview senior management within the organization. In DND/CF, for example all Level 1s, the DM, and CDS could be interviewed individually. The aim of the interviews would not be to ask directly for a focal issue, rather to gain insight into what the senior leadership views as the challenges for the future as well as lessons from the past. The results of these interviews would then be examined to determine the recurring themes.

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<sup>11</sup> The following section summarizes the content of “Developing and Understanding Scenarios,” Presented by Global Business Network Canada for DND January 8-10, 2002.

This is why individual interviews are crucial since a group discussion about these issues would potentially lead to “group-think.” The focal issue would be derived from analysis of the interview data with particular focus on the common themes. The interviewees must review the derived focal issue to foster consensus prior to proceeding with further analysis.

### **Past Changes**

19. To be useful, scenarios must be grounded in the current reality of the organization. Since past trends will likely continue into the future to some extent, it is important to understand the key drivers and challenges faced by the organization in the past. Those keyed on the focal issue are most important. To determine the important changes the interview questions previously discussed should seek the input of senior management. This input should be included within the context of a brainstorming session conducted by the scenario team, but only after they have exhausted their own thinking on past changes of importance. In the event that no interviews are undertaken, the development team could brainstorm this issue as well. The product of the past change analysis should be a list of key trends and factors which have previously influenced the success or failures of the organization and which will likely continue to do so in the future.

20. This portion of the exercise unavoidably risks promoting linear thinking since current events are the result of preceding ones. To that extent, it is impossible and undesirable to completely avoid thinking of the past to determine how the future could unfold. The key is to use these lessons in combination with unrestrained thinking of how future trends might transpire.

### **Future Changes, Factors, and Forces**

21. Having reviewed the past to determine the key influential trends, consideration of present trends and events as well as those anticipated for the future must be undertaken. These trends and events are the factors, or forces, likely to influence the evolution of the future scenarios. In the context of these scenarios strategic planners attempt to evaluate the impact of these factors or forces on their organization, treating them therefore as independent variables.

22. The manner in which these forces may be categorized depends on the organization creating the scenarios and particularly on the focal issue itself. The trends selected as factors are those which influence the focal issue. Hence, it becomes clear why selection of a relevant and precise focal issue is paramount to creating useful alternate futures scenarios. Examples of categories for DND/CF scenarios developed to model the anticipated future security environment might include Political Developments, Economic Conditions, Social Changes, Technological Developments, Environmental/Resource

Issues, and Operational Expectations. These categories could be further broken down into domestic and external factors.

23. Selection and analysis of factors must be as inclusive as is reasonable. The collapse of the Soviet Union provides a good example of how dismissing an extreme hypothesis can lead to oversight. There are very few analysts within the Western intelligence community who can claim that prior to the collapse they considered it possible. This lack of foresight left world leaders unprepared for the event when it occurred. Consequently, they were forced to deal with the changing situation in a reactive rather than proactive fashion. In this case, the short-term outcome was positive from the Western perspective, however the situation could have played out far differently due to the reactive nature of the decision-making. Moreover, the Russian transition to democratic system with an open market economy could have been assisted more effectively if the major states had prepared contingency plans to deal with such an eventuality.

### **Critical Uncertainties**

24. At this point in the scenario process the forces identified in the Past Changes and Future Changes analyses must be rated in terms of their uncertainty and impact. The AFS will be modeled in an orthographic projection. The two uncertainties most critical to the focal issue will form the X and Y-axis of the graph and will define the story-line in each quadrant.

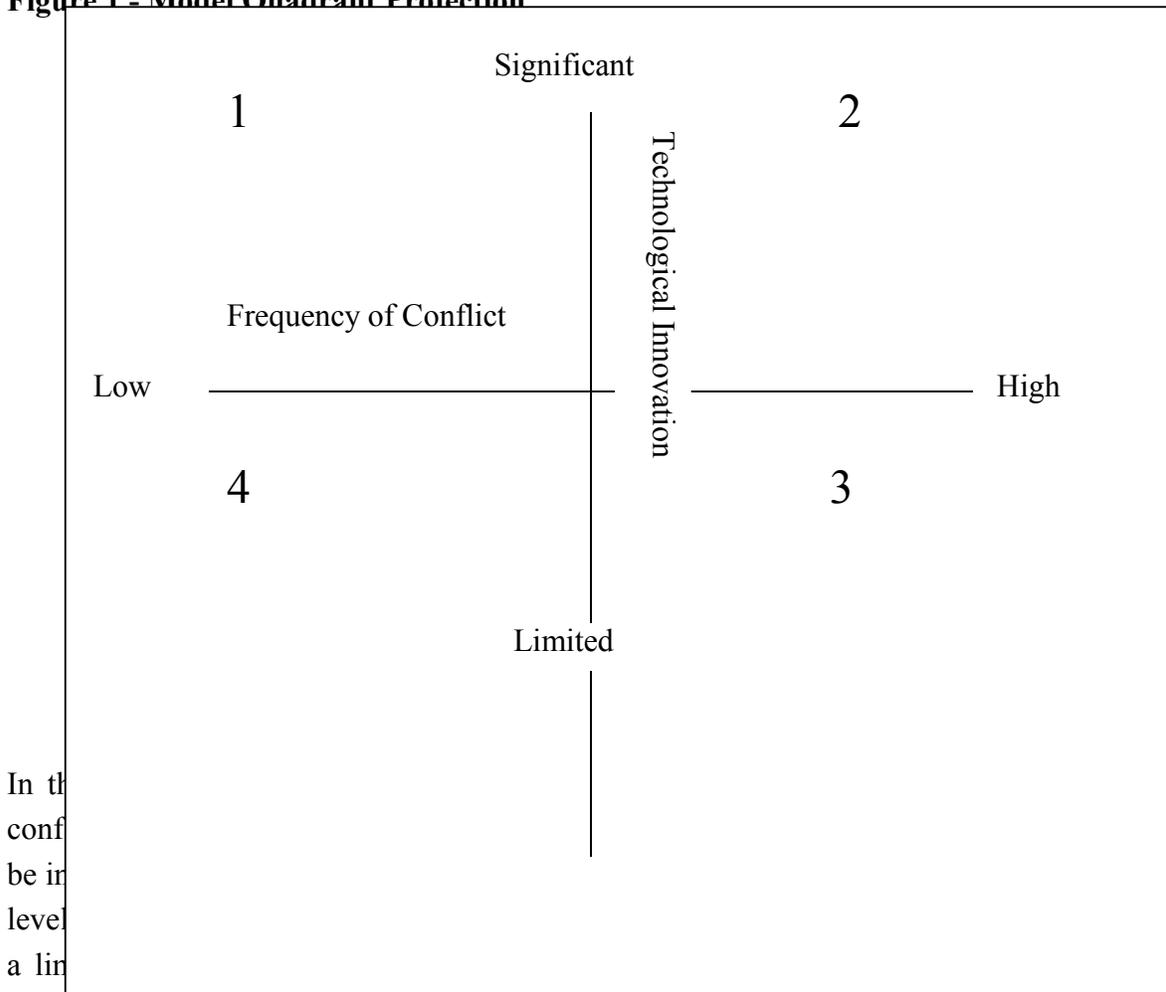
25. To accomplish the determination of the two axes each participant must vote on the forces. This can be done in a number of ways including rank ordering or scoring each item using a weighted scale, which incorporates both the importance and certainty of the factor occurring in the future. A system such as Decision Support Software could facilitate the selection of the critical uncertainties. In the end the two items selected must be most critical in terms of potential impact on the focal issue should they transpire and, at the same time, most difficult to determine if they will transpire.

26. The critical uncertainties must meet certain criteria. Foremost of these is that they must be independent variables, otherwise the scenarios will not likely be plausible nor will it be possible to graphically represent them as such. They must also facilitate the creation of challenging and distinct futures, which will be significant to the focal issue.

### **Developing Scenario Logics**

27. The logic development of the scenarios is dictated by the axis themselves. They define the direction of the future possible in each quadrant. The example of Technological Innovation versus Frequency of Conflict shall be used to demonstrate this.

**Figure 1 - Model Quadrant Projection**<sup>12</sup>



where there is a low level of conflict and a low level of technological innovation. Clearly, this logic will drive all key factors and define the forces within each of these quadrants.

**Scenario Development**

28. The process to develop the scenarios in each quadrant relies upon the creativity and expertise of the participants. At this stage, the participants must consider the evolution of each of the forces or factors identified earlier in the scenario process. Stories of how each force will transpire within the logic of the given quadrant must be developed. This process is done by first identifying a series of plausible events within a given quadrant. Additionally, other trends not considered as factors earlier may become apparent when fleshing out the quadrants. Inclusion of these will add value to the storyline within each quadrant. To develop plausible scenarios the “end-state” of the quadrant, as defined by the quadrant logic, must be taken into consideration.

<sup>12</sup> The Critical Uncertainties for Figure 1 were those derived during the Alternate Futures Working Group conducted to devise the HR 2020 Alternate Futures.

29. During this process, certain themes may emerge within a given scenario. These themes will result from the factors of critical importance to a particular quadrant. While all quadrants will likely share factors, their relevance will likely differ in each one. These themes are extremely valuable in that they indicate factors important to the organization as the future unfolds. As well, they can serve as signposts to indicate along which path the future is actually evolving. This in turn triggers contingencies developed in response to the scenarios. The themes are also valuable to help name the quadrants.

30. In our example, quadrant 2 could logically include a series of events related to the proliferation of WMD leading eventually to their use in a significant armed conflict. It follows in this example that there would be a period of embryonic WMD program development in a given state or states followed by a period of active development/acquisition and WMD operationalization leading to a period of escalating tensions resulting in an armed conflict utilizing WMD. This example can be broken into timeframes, such as Horizon 1, Horizon 2, and Horizon 3, and a detailed storyline of events within each period developed.

### **Implications**

31. The scenarios created in each quadrant contain events of importance to the organization which can lead to a number of crucial strategic questions. Central to these questions is an analysis of the threats and opportunities present in each quadrant. These implications can serve to inform the development of institutional strategy and contingency planning following the development of the scenarios themselves. Different strategic options can be validated through the scenarios to determine how robust they are in a given future or futures and which options are most flexible for a variety of futures. Moreover, an analysis of existing strategy or strategic decisions already undertaken can be measured in each quadrant to determine their strengths and weaknesses. The process of validating existing or potential strategy using scenarios is referred to as wind-tunneling. Wind-tunneling need not be part of the scenario building process but can be conducted at any time provided the scenario set is considered to retain its relevancy.

### **Indicators**

32. In populating the storylines of each quadrant, certain significant events will be developed. These events serve as signposts or indicators which should be noted to aid in future assessments of the environment faced by the organization. As the future unfolds, the occurrence of these indicators will provide warning that the world may be tending toward an outcome depicted in a scenario. This in turn could provide strategic warning to implement a contingency plan to deal with the event in question. It is important to remember however, that it is unlikely that any one scenario will come to pass in its entirety. Rather combinations of scenarios are more likely to occur. This is due to the

unpredictable nature of the environment. Scenarios are not intended to predict any one future, rather to indicate possible unfolding of the world.

## **CONCLUSION**

33. The development of alternate futures scenarios is an important undertaking for an organization such as the DND/CF. The scenarios are useful from four perspectives – developing strategy, validating strategy, providing indicators, and general risk management. While they are useful in highlighting potential future outcomes, they are not a predictive tool and should not be treated as such. Hence, the scenario sets should be used to devise contingency plans and to validate proposed strategies for future development. Use of alternate futures scenarios by DND/CF should be undertaken as a prelude to devising new strategy and also as a tool to validate force development options in conjunction with the FPS.

34. The purpose of this note is to demonstrate that alternative futures scenario planning is clearly a valuable tool for defence planners and to assess the value of the two standard methods. Clearly, both methods are of value to defence planning, particularly from a force development perspective. Given the advantages of the quadrant methodology and its relatively minor increased complexity, it seems logical that this method should be used in future exercises to develop institutional strategy.

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### **ABSTRACT**

Analysis of the future is a difficult proposition, but necessary in order to develop rational and robust force structure and military strategy. In order to reduce the difficulty inherent in futures analysis, it is useful to develop processes for doing so. Arguably, futures analysis is best conducted through the development of alternate futures scenarios against which the value of long range planning decisions can be judged. There are numerous methods of development of alternate future scenarios; each has its own merits and flaws. This paper examines two of these models, a linear approach and an orthogonal projection, and argues that the orthogonal projection model is generally more useful and less biased. It also outlines a process that DND/CF planners could use to create these models and facilitate their thinking about the future. This process is based upon the model used by ADM (HR-Mil) staff in developing the alternate futures scenarios used in support of HR Strategy 2020.

### **RÉSUMÉ**

L'analyse prospective constitue une tâche difficile mais néanmoins nécessaire à la création d'une structure de la force et d'une stratégie militaire rationnelles et solides, d'où l'importance d'élaborer des processus visant à faciliter cette analyse. De toute évidence, il est plus efficace d'analyser l'avenir en concevant des scénarios futurs de rechange en fonction desquels on peut évaluer la pertinence des décisions prises en vue d'une planification à long terme. Il existe de nombreuses méthodes permettant d'élaborer de tels scénarios, et chacune d'elles comporte des avantages et des lacunes. Le présent document étudie deux de ces méthodes, l'approche linéaire et la projection orthogonale, et stipule que cette dernière s'avère généralement plus utile et plus exacte que la première. Il explique également les grandes lignes d'un processus que les planificateurs de la Défense nationale et des Forces canadiennes pourraient utiliser pour concevoir leurs scénarios et faciliter leur analyse du futur. Le processus repose sur le modèle employé par le personnel du Sous-ministre adjoint (Ressources humaines - Militaires) pour mettre au point les scénarios futurs de rechange servant à appuyer la Stratégie 2020 des HR.

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**ALTERNATE FUTURE SCENARIOS**

**HR STRATEGY 2020**

**FORCE PLANNING SCENARIOS**



Canada<sup>111</sup>