Canadian Army Land Warfare Center (CALWC) Future Army Project

Review and Implications

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Scientific Letter

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Introduction

This Scientific Letter—written for the Canadian Army Land Warfare Center (CALWC) under the DRDC Manoeuvre Through Adaptive Dispersed Operations Project (MANADO)—provides an assessment of CALWC's Army Futures project—a multi-volume study aimed at exploring the missions, tasks, characteristics and capabilities of Canada's future army and to address the challenges which may arise circa 2040, through the use of alternative futures methodology.

The letter serves as a follow-on to an initial assessment of the project's research strategy and method produced in March 2015—extending that analysis to consider key issues surrounding the project's execution and results.[1] Following a brief overview of the project's rationale and methodology, the letter describes and assesses key components the project's conduct. It concludes by offering a number of observations and recommendations concerning the conduct of similar (i.e., follow-on) research efforts by CALWC.

Background

The Future Army Project (previously known as Army 2040) marked an effort to explore the requirements of Canada's Army in the Army's Horizon 3 (i.e., deep) future through the use of strategic foresight. The project was multi-method in character—involving the use of environmental or horizon scanning of key dimensions of the security and operating environments, an identification of trends and drivers judged as significant in those environments, an assessment of each based on the potential impact and uncertainty they were seen as likely to exhibit in future, and the development of four alternate futures based primarily on the two drivers judged as highest in terms of the impact/uncertainty assessment undertaken.[2] Futures developed were then employed in four seminar war games aimed at assessing the implications of each for

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[1] See, Peter Gizewski, Assessment of Army 2040 Research Strategy, Methods and Next Steps, Defence Research and Development Canada, DRDC-RDDC-2015- L073, 2015-03-09.
[2] Full elaboration of each world is available in Canadian Army Land Warfare Centre, Canada's Future Army: Methodology, Perspectives and Approaches, (Kingston, Army Publishing Office: 2014).

the missions, tasks, characteristics and capabilities viewed as required to ensure an effective Canadian Army circa 2040.[3]

Seminar war game participants were drawn from members of the Canadian Armed Forces (CAF), the defence science community (i.e., DRDC) and academia with an interest in concept and capability development. Seminar war games were held over a two year time frame—with each taking place over a five day period consisting of an initial day of instruction and introductory briefings on the future to be analyzed, three days of syndicate work addressing the key questions posed for exploration, and a final plenary wrap-up presenting the results to war game participants.

Participant discussion within working groups was guided by trained moderators—with input captured by appointed group members. Respondent comments and observations in plenary sessions were expressed verbally and/or through texting response devices secured for use in the project. Core members of the Future Army team were on hand to respond to any issues of fact or procedure for the full duration of each exercise.

Comparative analysis of the aggregate data produced in the four war games was conducted by the Army Futures Team, and presented in the second and third volumes of the study. These works represented a logical follow-on to the initial volume detailing the project's research strategy, methods, environmental scans and the alternate futures to be employed in the project's subsequent phases[4]—with the second focusing on those Army missions, tasks and capabilities found to be common among all four futures analyzed,[5] and the final volume identifying the missions, tasks and capabilities seen as required in each distinct alternate future.[6] A discussion aimed at providing capability planners with indictors (i.e., signposts, signals) that could suggest potential movement toward each of the alternate futures described, was also undertaken by the Futures team and presented in the projects third volume as well.

Project results were then used in support of efforts to develop the Army's capstone operating concept (i.e., *Close Engagement: Land Power in an Age of Uncertainty*). They are also intended to support future science and technology experimentation in support of capability development. The approach also calls for the project research cycle to be repeated so as to ensure continuous monitoring of the environment and the capacity to revise the findings of the initial project iteration should potentially impactful changes in that environment so warrant.

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[3] For the data collected from each of the four seminar war games conducted (including exit surveys) and accompanying analysis see, Bruce Chapman, Army 2040 First Look- Materialism Gone Mad: Methodology and Results for the First of Four Seminar Wargames, DRDC CORA, DRDC CORA LR-2013-207, 19-03-2013, Bruce Chapman and Chris Rankin, Army 2040 First Look- High Octane Green World: Methodology and Results for the Second of Four Seminar Wargames DRDC CORA TN 2013-192, November 2013, Bruce Chapman and Peter Gizewski, and Army 2040 First Look- Global Quagmire World: Methodology and Results for the Third of Four Seminar Wargames, Defence Research and Development Canada, DRDC-RDDC-2014-L126, 014-07-09, and Bruce Chapman and Peter Gizewski, Army 2040 First Look- Recyclable Society: Methodology and Results for the Fourth of Four Seminar Wargames, Defence Research and Development Canada, DRDC –RDDC-2014-L127, 014-07-09.

[4] See, Canadian Army Land Warfare Centre, *Canada's Future Army: Methodology, Perspectives and Approaches,* (Kingston, Army Publishing Office: 2014).

[5] See, Canadian Army Land Warfare Centre, *Canada's Future Army: Force Employment Implications,* (Kingston, Army Publishing Office: 2016).

[6] See, Canadian Army Land Warfare Centre, *Canada's Future Army: Alternate Worlds and Implications,* (Kingston, Army Publishing Office: forthcoming 2017).

Assessment

The question of whether the research strategy that was pursued merits retention as a means through which to explore future Army capability development cannot be answered definitively. Given that the Future Army project was completed only recently, there is little evidence available upon which to clearly and decisively assess its impact on the capability development process. Nevertheless, completion of the initial iteration of the project cycle allows some preliminary observations and conclusions to be drawn regarding the utility of the approach taken, its conduct and its results.

Utility of Project Strategy

The focus of the Future Army project was the exploration of the future security and operating environments and their potential implications for Army capability development in the 2040 timeframe. The aim was to sensitize decision makers and capability developers to key trends and drivers at work in the security and operating environments, the possible impacts which these forces could produce in terms of presenting future military and defence challenges, and the characteristics and capabilities Canada's Army could require in order to effectively address them. Throughout, the focus was on investigating future possibilities vice prediction of any particular future.

To these ends, strategic foresight and the use of alternative futures analysis provided a logical and appropriate means for addressing CALWC requirements. Aimed at exploring the "distant future" (e.g., 15–20 years), the approach accorded well with the timelines generally involved in the capability development process and the need to think carefully about long term developments in the security and operating environments and their possible implications. Moreover, its focus on the development and exploration of a range of possible future environments, vice a single "expected" future, helped to ensure investigation of a wide array of possibilities and outcomes. As such, risks of inadvertently and excessively focusing on consensus views of the future were substantially reduced if not eliminated. And the prospects for the promotion of more informed, flexible decision making were increased.[7]

Furthermore, the adoption of an alternative futures approach not only heightened the prospects for greater breadth of exploration of the future environment generally, but also the capacity to more fully investigate the question of system change and possible indicators (i.e., signals, signposts) of its potential occurrence—an important component of the project and a requirement which no alternative strategy could fulfill to the same extent. Indeed, by allowing the team to consider how *a range* of futures might emerge out of the current environment, "alternative futuring" more fully facilitated the creation of a warning system comprised of indicators (i.e., signposts) of change for decision makers to utilize when considering future capability development.

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[7] As one prominent foresight practitioner notes, "(t)he power – and basic rationale – of foresight … lies not in any ability to 'crystal ball' the future, but rather in its ability to alter perspectives and reframe processes so that individuals and organizations can better cope with a rapidly changing and complex environment. Its focus on the development and analysis of multiple alternative futures aims to encourage policy-makers to consider a range of possibilities and thereby form policy responses and plans that can effectively cover a range of contingencies as opposed to one or two." Foresight in short, allows for the exploration of possibilities (i.e., possible futures and outcomes), sensitizes users to potential changes in the environment and helps one formulate how best to address them. In this sense, foresight is less about reducing uncertainty than managing it. See, Joseph Voros, A Primer on Futures Studies, Foresight and the Use of Scenarios, The Foresight Bulletin, No. 6., December 2001., Available online at http://thinkingfutures.net/wp-content/uploads/2010/10/A_Primer_on_Futures_Studies1.pdf .

Beyond this, the approach accorded well with the resources available to CALWC and the Future Army Team. Its use was relatively low cost in implementation and not overly dependent on particular technologies or specialized computer software for completion. The skill sets of the Futures team—a team comprised of personnel from a range of disciplines (i.e., strategic analysis, science, operations research and military affairs) corresponded well with the multidisciplinary character of the inquiry. And CALWC's location allowed for easy access to the subject matter experts (SMEs) needed to address subjects and issue areas requiring more specialized levels and types of expertise (e.g., Royal Military College of Canada, Queens University).

Methods and Techniques

Methods and techniques employed in the analysis were similarly appropriate for rigorous and systematic investigation of the project topic. These ranged from environmental scans of important dimensions of the security environment to brainstorming exercises aimed at drawing out key trends and drivers from scans conducted, to the "red teaming" of all observations and results leading to the development of the four futures created.

Judgements concerning the scans conducted, the drivers identified and the key drivers selected in developing the four futures employed in the study were informed by a careful review of existing literature, SME advice and peer review.[8] And publication of an initial volume detailing the overall approach and research process followed and thereby ensured full transparency of all methods and techniques used.[9] In short, conduct of the project conformed to many of the "best practices" cited in the scientific literature on the development and use of alternative futures approaches.

Participant Selection

The focus on ensuring adequate representation of key stakeholders from across the concept and capability development communities constituted a logical approach to participant selection for project seminar war-gaming. Not only did this help maximize the opportunity for key military organizations to express their observations and opinions concerning the concept and capability development implications which each world might hold for Canada's Army, but also increased the possibilities within the war game sessions for capturing diverse points of view. It also raised the prospects for ensuring a broad awareness of the project itself as well as support and buy-in for the effort across the CAF.

Less clear was the extent to which individuals chosen to participate in each of the war games were themselves suitable for engaging in an alternative futures exercise. Drawing participants from a population consisting primarily of military officers may inadvertently run the danger of yielding results reflecting short-term thinking and an excessively narrow point of view.

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[8] Notably, questions could be raised concerning the key drivers used for the development of the project's alternative future framework. More specifically, the selection of energy and environment as the two principal drivers upon which the four alternative futures were constructed raised the possibility that neither was sufficiently independent from the other to consider them as truly distinct drivers. The core teams conduct of the exercise with two alternate drivers—an exercise which yielded somewhat similar results in terms of the character of the future worlds created—reduced concern of this to a degree. Beyond this, the fact that all drivers identified in the study were taken into account in the development of the futures developed similarly served to provide confidence in the robustness of the futures conducted.

[9] See, Canadian Army Land Warfare Centre, *Canada's Future Army: Methodology, Perspectives and Approaches,* (Kingston, Army Publishing Office: 2014).

Both time constraints and resource limitations ensured that no detailed or systematic process was developed or employed to evaluate the comfort level or the capacity of individuals chosen to engage in such a task.[10] Nor is it clear that development and application of such evaluative criteria would necessarily result in any appreciable change in the character of results yielded. Nevertheless, consideration should be given to exploring options for more fully ensuring that participation in any future foresight effort is as appropriate to the task as possible.

Participant Engagement

Efforts to ensure and promote a high level of participant engagement were numerous. These ranged from the character of the project materials developed and distributed to the methods used to facilitate interest and discussion in each of the futures explored.

By and large, such methods were deemed worthwhile and successful by project reviewers and participants. SMEs evaluating the project's method judged alternative futures to be clearly written, logical and well organized.[11] They were also viewed as providing enough detail to generate meaningful discussion and were presented in a manner, which avoided channeling discussions toward specific conclusions regarding the characteristics and capabilities needed by Canada's Future Army to meet the threats and challenges that might arise in each of the four worlds employed in seminar war game analysis.[12] As for war game participants, reaction to material presented was similarly positive. Exit surveys conducted upon the conclusion of each of the four war game exercises reveal—in each case—that the vast majority of respondents rated the project favourably in terms of its clarity of purpose (i.e., objectives), the materials distributed (e.g., read in package) and the presentations delivered.

Use of an audio visual presentation to further acclimatize participants to each future was also viewed as an asset for promoting engagement. As the SMEs observed, such a technique was ideal for helping better place participants in the "head space" required to more fully engage with the alternative future under investigation.[13] By presenting participants with a possible roadmap as to how the future under consideration could emerge from conditions existing in the international environment today—a level of plausibility was added to the investigation that was less likely to have existed otherwise. Accordingly, possibilities for greater participant interest and buy-in for the exercise were increased.

Meanwhile, use of an audience response system allowing participants to register comments throughout plenary sessions, as well as facilitators to guide workshop discussions, similarly appeared to represent well-chosen and useful tools for facilitating constructive participant input on all aspects of the war games. In the case of the former, this helped alert the project team not only to viewpoints and questions concerning the future under examination, but more broadly to issues and areas in need of additional explanation and clarification—often with the result of enabling needed adjustments to occur quickly and effectively. Moderator involvement in the workshops extended this further, and helped to ensure that workshop discussions were focused and on topic.

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[10] Notably, exit surveys conducted after each seminar war game revealed that while a majority of participants expressed the view that they felt that they were the "most appropriate choice" from their respective organizations for engaging in the war game they attended, the size of that majority was relatively modest (i.e., slightly in excess of 60 percent in each case).
[11] See, Peter Gizewski, Assessment of Army 2040 Research Strategy, Methods and Next Steps, Defence Research and Development Canada, DRDC-RDDC-2015-L073, 2015-03-09, p. 3
[12] Ibid.,
[13] Ibid.,

Data Analysis

Data gained from the four war games was collated and analyzed by the Project's core team. To this end, findings for each research question (e.g., Army missions and tasks, and characteristics, and capabilities Canada's Army would require in each world) were collected in the seminar workshops and then categorized by the core team.

Participants were given a free hand in identifying and describing the missions and tasks, capabilities, and characteristics they viewed as important in the four futures examined. This approach helped to ensure identification of subtle differences in characteristics and capabilities that may have otherwise been regarded as similar across futures.

Yet the practice also created challenges in terms of aggregating project results and generalizing capability types across futures. Notably, results for each of the three questions posed were collected, aggregated and presented to participants during each war game—given the time constraints, a task which placed considerable pressure on the project's core team to deliver during each exercise. Beyond this, the data identification and description procedures raised the question of how to ensure that results gained for all four war games were conveyed in a manner which would capture common capabilities across worlds, as well as the differences which might exist in realizing them given the varied character of the worlds themselves.

Here, while the project team aggregated characteristics and capabilities under standard labels to provide an idea of which were most common across worlds, additional analysis aimed at explaining how differences of nuance might well exist in capabilities depending on the character of the alternate future under consideration was also provided in the project reports.[14]

Whether less onerous means of capturing and describing data can be devised is unclear. That said, the data categorization and presentation challenges which the team encountered *do* indicate that careful attention to such issues must constitute an important component of any similar foresight effort. Indeed, such consideration is necessary in order to reduce risks of data misclassification.

The examination and identification of potential signposts of system change offered fewer challenges. Such analysis was exclusively the result of the collective efforts of the project team based on their assessment of the key drivers likely to be associated with the emergence of each alternate future. As such, the assessment is somewhat impressionistic and can be open to challenge. To be sure, signals identified and the analysis which accompanied them is strongly supported by insights derived from environmental scanning efforts and carefully qualified to underscore their tentative and contingent character. The report also acknowledges the preliminary character of the effort (i.e., an initial attempt to demonstrate how a warning system may be developed for use by capability developers). Nevertheless, consideration of a more rigorous analysis of signals and signposts—perhaps involving broader participation in that aspect of investigation—would be warranted should further pursuit of such a goal be undertaken.

Impact

Thus far, results of the project have served as an important component in CALWC's Horizon 2 capability development work (i.e., Canada's Army circa 2025–30). Indeed, Future Army findings have provided a key benchmark for the conduct of a gap analysis leading to CALWC's development of

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[14] Notably this step was in accordance with the advice provided to the Project Team by members of the expert workshop held prior to the assessment of project data. See Gizewski, Assessment of Army 2040 Research Strategy, Methods and Next Steps, Defence Research and Development Canada, DRDC-RDDC-2015-L073, 2015-03-09, pp. 6–7.

Close Engagement: Land Power in an Age of Uncertainty, and a rationale for championing *Close Engagement* as a "core competency" for the future land force.

Beyond this, however, evidence of project impact remains spotty. To some degree, this reflects the fact that the project has only recently been completed and released. A fuller assessment of impact will only be possible with the passage of time. Yet at present, the capacity to do so is not fully evident. More specifically, few if any clear methods and metrics have been developed thus far to help assess the impact of such work. Nor has much attention been given to what such evidence would consist of or to developing a system for its collection and analysis.

To be sure, the absence of such criteria for assessment stems in part from the character and chief purpose of strategic foresight itself (i.e., to broaden mental horizons and sensitize decision makers to future possibilities). Such a goal does not lend itself easily to empirical testing—particularly in the case of large organizations in which personnel are not only widely dispersed, but heavily tasked and often available for only short periods of time. Nor might a number of significant indications of impact be easily verifiable. To the extent that the results of foresight influence an individual or organization *not* to adopt a certain course of action, evidence of significant impact may be entirely absent.

Nevertheless, given the expenditure of time and resources required to produce such analysis, attempts to provide more tangible indications of impact do deserve consideration as a means of justifying the effort as well as the approach taken. In their absence, such efforts may run the danger of being perceived as a luxury and consequently, of being marginalized as a result.[15]

Project Cycle

While strategic foresight may well represent a logical approach for investigating future Army requirements, such work is time and labour intensive—to succeed, requiring a sustained commitment by the organization pursuing it. In the case of the Future Army effort, project duration was approximately seven years from conception to completion of the initial iteration.

This creates challenges of focus and continuity, as work schedules are at times interrupted by other priorities, and staff turnover forces review of established methods, skill sets and their application. War-game scheduling and securing appropriate war game participation become more challenging. And the up-front process of alternative futures development—a process involving considerable research, group brainstorming, regular consultations with SMEs and data assessment—demands considerable focus and effort. The fact that the approach calls for the project cycle to be repeated to ensure continuous monitoring of the environment only increases the level of material and human capital investment required.

Should the approach be retained in its current form, future iterations will likely be less time consuming given that methods and tools for its conduct are more firmly established and knowledge has been gained from an initial iteration of the process. That said, such an approach will—by definition—always be a time and labour intensive enterprise and will thus remain somewhat vulnerable to staff turnover and the need to address issues of immediate concern (i.e., the 'crises of the day"). Continued use of the approach must proceed with such realities in mind.

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[15] Interestingly, while the large majority of war game participants expressed the view that foresight was a useful method for conducting capability development, most were also not convinced that the Future Army Project would result in positive change for the Army. In fact, these views were consistent in exit surveys conducted in all four war games.

In accordance with the approach's project cycle, monitoring and assessment of the subject environments should be continuous, and should begin afresh after each full iteration of the cycle is completed. That said, movement toward full development and war gaming of alternative futures at four or five year intervals would seem appropriate. Such a duration is generally in accordance with the realities of personnel turnover in military organizations and—if history since the end of the cold war provides any indication—one in which trends and drivers in the environment are likely to have had an opportunity to exhibit some appreciable change.

Conclusion

Whether CALWC continues to exploit an alternative futures approach as a means of informing future concept and capability development efforts remains uncertain. That said, an analysis of the project yields a number of observations and recommendations worth considering in formulating any final decision on a way forward.

First, use of an alternative futures methodology does offer a logical and relatively effective means of addressing the CALWC's goal of sensitizing decision makers to a range of long term possibilities regarding the security and operating environments, the opportunities and challenges they may pose, and the characteristics and capabilities Canada's Army may require to effectively function in addressing them in the future. To the extent that this goal remains in place, such a method is more appropriate than single case "expected future" studies, and more fully allows exposure to a range of possibilities than the alternative.

Similarly, assessments provided by the SMEs reviewing the project, as well as the vast majority of war game participants involved in the four war games, indicate that materials developed and presented, and the manner in which the seminar war games were conducted, are relatively effective in encouraging constructive dialogue and generating the empirical data needed to address the key questions advanced by the CALWC team.

That said, the initial iteration of the project strategy indicates a number of areas in which additional measures might be considered for improving the process and results yielded should the approach be retained. In this event, CALWC should:

- Continue to ensure that the strategic foresight programme is adequately resourced and capable of sustained effort over an extended period. Such an approach requires considerable time and resources to conduct and involves a cycle which demands repetition. Failure to recognize this risks the loss of project momentum and analytical focus.
- While participant selection for war-game play in the Project's initial iteration is adequate, efforts should be made to investigate the extent to which the selection process can be improved. To this end, options might include further extending participation beyond the military community, as well as examination and application of pre-testing-evaluation practices aimed at more fully ensuring appropriate participant selection for futuring exercises.
- Consider incorporating detailed operational scenarios within each alternate future. This is entirely consistent with the alternative futuring approach and may serve as an additional means to more fully engage military war game participants by placing more emphasis on a level of investigation which they are familiar and with and particularly interested in exploring.
- To the extent that war game participants are sceptical as to the utility of an alternative futures approach, consideration should be given to employing them more formally in the role of "red teamers" in those workshops devoted to investigating key project questions. This may increase their level of engagement and more fully ensure that investigations proceed with a critical eye.

- Allow more time for the conduct of data analysis during war-game sessions. While each war game took place over a five day period, time allotted to introductory and concluding sessions left a three day envelope for categorization and aggregation of data, with results of each workshop requiring readiness for presentation at the following day's plenary. Such a schedule places high analytical demands on the core team and increases possibilities for misclassification of data in the process. Accordingly, consideration should be given to extending the time available for data collation and analysis during each seminar war game undertaken.
- Provide more rigorous analysis of signals and signposts indicating system change, perhaps through more systematic and broader participation in that aspect of any future foresight investigation.

Finally, and perhaps most importantly, efforts should be devoted to developing and applying methods aimed at systematically gauging project impact. To this end, CALWC should consider engaging relevant members of the defence science operations research and analysis community in exploring and developing viable methods of impact assessment for strategic foresight. Absent empirical evidence that such studies contribute to achieving their stated goals, interest in and support for their conduct is likely to fade, particularly in resource constrained environments. In its absence, while such studies may well be viewed as "nice to have," few will see them as an *essential* component of the capability development process.

Prepared by: Peter Gizewski (DRDC – Centre for Operational Research and Analysis).

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