1 INTRODUCTION: COOPERATION AND HOW IT TAKES SHAPE

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This report is about cooperation, the way it is changing in the information age, and what this means for our national defense organizations (NDOs). We all know that cooperation helps solve challenges or achieve desired outcomes. In complex problems, it might even be a condition *sine qua non*. The downside is that cooperation also induces transaction costs. To what degree organizations seek cooperation then becomes a cost-benefit issue. But here is the crux of the matter: the calculus underpinning cooperation choices is fundamentally changing, mainly due to the ongoing ICT-revolution. The cost of organizations working together has been drastically reduced. For many organizations operating in an increasingly connected and therefore more complex world, both the pressure and the opportunities to cooperate have drastically increased. This different calculus has given rise to much more open, smaller scale – to the extent that individuals next to organizations have become part of the equation – and vibrant forms of cooperation, in many instances rapidly displacing traditional forms of stove-piped and closed cooperation models.

Our focus is on cooperation in the defense and security domain. In the analysis below, however, we will take concepts and examples from the business world and explore whether successes and lessons learned in the private sector can also be applied to our NDOs, even in operational processes for which the 'business logic' of commercial markets has limited applicability. Driven by competition and the process of 'creative destruction', the innovative drive in finding new forms of cooperation is conquering new heights every year. Some of these seem remarkably efficient. Let us take a look at an example that we are all familiar with. Encyclopedias used to be the result of one particular type of cooperation in which a for-profit commercial company paid a number of contributors a fee to write high-quality entries in a printed multi-volume edition that was sold (at a relatively high price) to as wide a group of paying customers as possible. Encyclopedia Britannica, for instance, employed a relatively small number of in-house editors who contracted some 4500 contributors – typically eminent credentialed

experts in their fields who were paid for their contributions – to write their entries. Customers paid thousands of dollars to acquire these lavishly produced tomes that they kept in their libraries for longer periods of time. Wikipedia, on the other hand, is the result of the mass cooperation of millions[1] of unpaid volunteer contributors who operate based on self-imposed but fairly strict rules under a non-profit organization. It is constantly updated and freely accessible to anybody with internet access. One of the fascinating aspects of this cooperation is how multiple editors cooperate (and fight[2]) transparently (on the talkpage) on individual entries to produce high-quality entries. Many of us have come to rely on them.

This report has the following structure. This Chapter sets the scene by placing cooperation options and choices in a strategic context, and by describing in general terms the new strategic possibilities for cooperation strategies made possible by the ICT revolution. Chapter 2 through 4 turn our attention to three concrete cases of non-traditional cooperation forms that we consider to be of great promise for NDOs: 'open innovation', 'tapping into the hacker community', and 'Ushahidi, an open platform for situation awareness'. Chapter 5 lists the main recommendations we have drawn from this research effort for the ways in which NDOs might be able to widen their cooperation portfolios. Chapter 6 closes of with some final thoughts on the matter.

1.1 Current Cooperation choices and the need to adapt

The Dutch defense organization already has a fairly broad set of cooperation forms and cooperation partners. First and foremost, this set involves close, highly formalized and long-standing relationships with other NDOs of, often like-minded, allies within NATO or the EU. These relationships represent strategic choices, in which serious (political, financial, diplomatic, etc.) investments are made. Other relationship options can be more ad hoc, as in the case of the countries alongside which The Netherlands might find itself in various operations around the world. One could call these, to use the military levels of war (or echelon) analogy, 'operational' alliance choices instead of strategic ones – but they too represent a strategic choice at any given moment in time. However, the Dutch and other NDOs cooperate with far more than only with their military partners: with other government departments or agencies at home and increasingly abroad; with NGOs; with local communities in their home countries or abroad; with defense industry partners or suppliers; with knowledge institutes, etc.

But while their portfolio of partners is broad, it also tends to be somewhat lopsided. The recent joint Clingendael and HCSS report *Internationale Materieelsamenwerking* (International Materiel Cooperation) contains two tables describing existing and

potential international cooperation projects in which the Dutch defense organization participates.[3] These tables clearly exhibit a preference for long-term, formalized, closed cooperation setups with mostly like-sized, like-minded, and likewise organizations. These traditional kinds of cooperation clearly remain important. But this report set out to explore *other* forms of cooperation that NDOs have thus far not had much experience with – with unfamiliar partners and in more open and more loosely coupled ways, facilitated by new technological developments. In the information age, 'connect and being connected' is more and more a prerequisite for being able to achieve strategic effects in many different domains. It this new age, defense and security challenges once again have become very much part of society and societal processes at large. Defense and security ecosystems that try to cope with these challenges are emerging. Consider the words of the Commander of the Dutch Armed Forces General Tom Middendorp from his opening speech at the 2015 Future Force Conference.

From the opening speech of CDS General Tom Middendorp at the 2015 Future Force Conference

"I think it's of vital importance that we come to realize that we are all actors in a defensive ecosystem. A system that constantly reshapes itself... Parts of this ecosystem can be – and have to be – actively arranged and managed in conventional structures… However, as the custodians of our societies' security, we also have to explore other parts of this ecosystem… Take Google or Apple for example with their mobile 'app' stores. They provide a free and open platform, that all sorts of 'ecosystem partners' can hitch a ride on. Both 'planned' and 'unplanned', while in the meantime allowing Google and Apple to benefit from the ideas, creativity, capabilities and actions of others. I wonder whether that is something that our defense organizations might learn from."

Outside of the defense world, a number of actors have stumbled onto new forms of cooperation that – at least in some areas – seem remarkably successful. Are there any lessons in this for NDOs and successes to be replicated? Can and should the current partnership portfolio of our NDOs become more diversified to leverage all the possible cooperation options that are out there?

1.2 Towards Defense PORTFOLIO thinking

Our NDOs are confronting a turbulent environment. Fundamental changes seem to emerge with increasing speed, vehemence, and impact. There is a growing recognition that the resulting new risks and opportunities require not just new strategies but also

a new approach to strategy itself. Most of us have become accustomed to defining strategy *purposefully* by identifying a strategic goal and then pursuing it. Increasingly, a number of fields are also emphasizing the need for a more *adaptive* and/or *experiential* approaches to strategy. Instead of (or: alongside) defining an end goal and then sticking to it, prudent planning recommends a more permanent orientation effort, whereby planning assumptions are constantly challenged and – wherever necessary – adjusted based on the changes that are occurring or anticipated in the environment. Building upon this permanent monitoring process, the concept of *navigation* should be adopted, in which actors (can) constantly adjust their course to keep their ship afloat in turbulent waters and keep heading in the right direction. Over the past couple of years, the Dutch defense organization has put emphasis on the strategic function Anticipation, which underlines the importance of a permanent orientation and navigation processes.

In recent years, HCSS has emphasized the need for an additional analytical element that allows actors to straddle the gap between orientation and navigation. We have called that strategic element "strategic portfolio design". Portfolio thinking is widely recognized as one of the robust stratagems for hedging risk and uncertainty.[4] Financial experts, for instance, have elevated portfolio thinking to the standard approach to risk and uncertainty. But this fundamental and widely acknowledged stratagem for dealing with risk and uncertainty in investment choices could – and we suggest: should – also be applied to strategy itself. HCSS proposes thinking of strategy in terms of a broader 'strategy space': a multi-dimensional space with many plausible and desirable strategies that could be pursued. The main intuition here is to put a rich strategic portfolio at the heart of the strategic planning process and not a singular strategic choice.

Currently, NDO planners allocated to the planning of our capability portfolio are mainly focused on long-term acquisition of materiel. In our own view, three main 'forward'[5] defense planning questions are crucially important for any NDO: *what* can we do (policy options), *with what* (capability options) and *with whom* (ecosystem partner options). We regard all of these portfolio choices and the analysis behind the choices as being equally important. And yet right now, it is mainly the second question (with what?) that is receiving – albeit in our view often too limited[6] – attention through the defense acquisition process. The first (what?) and third (with whom?) questions are typically dismissed as ones that defense planners should not concern themselves with but that should be left to the political side of the house. We submit that they are not of a different (political) nature, but do require equal prior (pre-political, pre-ideological, etc.) analysis that is as dispassionate, rigorous, and transparent as the

analyses that should go into acquisition choices. Any such portfolio analysis, when properly done, is highly unlikely to yield unique answers. Instead, it is likely to highlight some key strategic trade-offs that (politically legitimate) decision-makers will have – and, we would hope, want – to be informed about when deliberating and finalizing their decisions. In previous and ongoing work, HCSS has and is already experimenting with a portfolio of policy options.[7] In this paper, we focus on the portfolio choices NDOs can make with respect to the 'with whom' question.

1.3 dimensions in cooperation space

What do we actually know about cooperation and the different forms it can take? Cooperation is an important topic of inquiry in many different academic disciplines. Biological lifeforms cooperate. Economic agents cooperate. Political movements and parties cooperate. States cooperate. Defense organizations cooperate. It is therefore quite surprising that we do not have a working classification scheme for the many different types of cooperation that exist in and across all of these different disciplines. The labels that are given to the various elements of cooperation differ from discipline to discipline. But in all of them we find back the entities that cooperate (who?), the purpose of their cooperation (why?), the nature of their cooperation (what?), the interfaces between them (how/through what?), and the broader system within which they cooperate (where?).

In preparing for this report, HCSS has started building a more general taxonomy of cooperation. This initial effort, contained in Annex A, is far from definitive – if such a condition exists at all for such a complex phenomenon as 'cooperation'. The main idea behind this try-out was to demonstrate that cooperation is indeed multi-faceted and is best thought of as a multi-dimensional option space rather than as a binary choice. To make this abstract idea of a 'cooperation space' somewhat more tangible, we have selected three key dimensions from that multi-dimensional space to further elaborate here, based on two considerations. One, they point to areas that appear new in the sense that NDOs are currently not investing much in this part of the cooperation space. And two, these new forms of cooperation are already successful outside of the defense and security realm and might be promising within that realm as well. In the Chapters 2 through 4 we will explore these new and promising areas in more detail through three case studies.

The first dimension differentiates between cooperation that deals with physical things and/or interactions and cooperation based on digital information exchange and sharing. The digital age is starting to enable radically different cooperation opportunities. In the

past decade, cooperation in the digital sphere has seen a lot more change than cooperation in the physical sphere. Examples of such forms of cooperation are Linux open source software, Wikipedia, purely digital cooperation between a client and her bank through online bank accounts, or github, where people build online software together.[8] Additionally, the digital and physical spheres are increasingly converging. Examples of such converging are 3D Manufacturing and the growing role that Computer Aided Design (CAD) is playing in the physical world.[9]

A second dimension is whether cooperation is tightly or loosely structured. Researcher Karl Weick developed the concepts of tight and loose coupling to describe organizational structures in educational institutions, but the same concept can be applied to businesses and governments. According to Weick, a tightly coupled organization has a set of mutually understood rules enforced by an inspection and feedback system, while in a loosely coupled organization, these are not in effect.[10] This means that in loose form of cooperation, there is less interdependency and entirely different forms of coordination and information flow. An example of a loose form of cooperation is the hacker community, where each hacker is an individual, even though certain hackers might cooperate in an attack. In a tight form of cooperation, however, there is much more interdependency, coordination, and information flow. An example of a tight form of cooperation would be the contracts the Dutch Defense organization has with other Defense organizations, or with companies such as Thales or TNO.[11] In these modes of cooperation, fixed contracts are set up with regular coordination and information flows.

The third dimension is the difference between open and closed innovation. In closed innovation, each company works on a service or product separately, keeping the manufacturing process secret (e.g. closed) to outside parties or companies. In open innovation, the manufacturing process is opened up so that people and organizations from outside the company can join in. An example of open innovation is General Electric's 3D printing contest. When General Electric found that it lacked knowledge to 3D print a light-weight jet-engine-bracket, the company organized a contest inviting people to engineer one for them. This became a huge success, after which the company started more initiatives.[12]