“The contribution of design in cultivating a culture of innovation”

Major Jeffrey van der Veer

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1. Introduction

Contemporary conflicts are complex and the world of today seems to be less predictive than ever before. It now appears that stable systems with simple and predictable dynamics are in fact exceptions rather than the rule. And most crucially, the local randomness of nonlinear systems are omnipresent. These implications suggest that the world does not work in a mechanistic, deterministic fashion; that complex social interactions as such as military innovation or actual combat do not reduce to simple linear processes and that the study of human affair – the interplay of thousands of independent variables is more of an art than a science. The process of innovation in military institutions and cultures, involve multiple actors, complex technologies, and uncertainties of conflict and human relations[1]. In this world innovation becomes increasingly important, as military leaders must address emerging threats, resource constraints, and rapid technological advances. Innovation provides military organizations with the ability to profoundly transform capabilities, concepts and structures to counter future threats to national and international security.

My aim with writing this paper is to contribute in looking for answers on the question how we can create a culture of innovation in the Netherlands Army. The contribution on this subject focusses on the subject of Design as innovative concept, in order to implement Design as innovative concept a culture of innovation is needed. So the main question that I will investigate is: "How can design as an innovative concept for the army contribute in cultivating a culture of innovation?"

This paper will first provide a theoretical framework to introduce the fundaments of innovation and from there on elaborate on culture of innovation. The theoretical framework will predominantly focus on William Murrays work and recommendations for building a culture of innovation. Sequentially the next paragraph provides the empirical framework. In this paragraph design as an innovative concept will be explored. After having surveyed both the theoretical framework and empirical framework the analysis will put both in context. We will sequentially survey how design as innovative concept fit in with Murrays recommendations for building a culture of innovation. Finally, in the conclusion the main question will be answered.

2. Theoretical framework

This paragraph provides the theoretical foundation for this paper. In the first sub-paragraph the fundamentals of innovation will be explored. Sequentially in the second sub-paragraph the dynamics of developing a culture of innovation will be surveyed and summarized in Murray's recommendations.

2.1 Innovation

It is important to establish a clear understanding of what is meant by innovation. A simple description considers innovation as the introduction of something new[2]. This may result in a new products, services, processes or organizational elements. While this definition provides a starting point for discussion, it does not address the scope or complexity of the term, nor does it provide any grand vision for how innovation occurs. The 'newness' which accompanies innovation indicates that something has changed which may be the result of either an internal or external influence. As such, innovation and change are inexplicably linked. Successful innovations inevitably result in a significant

[1] Williamson Murray, "Innovation: Past and Future, "*Joint Quarterly* 12 (Summer 1996), p 24.
[2] Miemie Winn Byrd, "The Anatomy of the Innovative Organization: A Case Study of Organizational Innovation Within a Military Structure" (Ph.D. dissertation, USC Rossier School of Education, May 2012), p 20.

degree of organizational change. In essence, innovation is about managing change. It is worth noting that although all innovation constitutes change, not all change is innovation[3].

Innovation in a military context applies to the development of new capabilities, concepts, structures, processes and organizations. Unfortunately it is that innovation like most complex human endeavours, occurs in military institutions in an opaque and unclear landscape[4]. Military organizations must innovate in the way they train, prepare, plan and fight. In other words, innovation plays an integral role in force development, force generation and force employment activities. While this may seem a fairly straightforward statement, it is far more difficult to put innovation into practice. Considering the many barriers to innovation that exist within the military environment, innovation is unlikely to occur without a deliberate strategy.

Major innovations are the driving force behind radical transformation of military concepts, processes, capabilities and structures. It is difficult to imagine a military institution undergoing any degree of transformation without the innovative ideas that provide an alternative to previously held principles. Transformation is exactly that: a change so significant that it renders the current paradigm obsolete. Any military innovation in this respect fundamentally changes the way in which campaigns and wars are fought[5]. It is important to distinguish an innovation as a process rather than a product, service or end state. In the hierarchy of change, from adaptation to transformation, innovation is the catalyst for change in the conduct of warfare. As such, innovation becomes a means to an end rather than the end itself.

2.2 Culture of innovation

Organizational culture is a major enabler of military innovation. The cultural model has gained significant interest since it was formally introduced in the 1990s and defined organizational culture as the set of basic assumptions, values, norms, beliefs and formal knowledge that shape collective understandings[6]. The cultural model of innovation draws a link between organizational norms and the willingness of individual members to accept risk, foster creativity, challenge the status quo, and engage in critical thinking. These are all concepts that contribute to innovation and are directly influenced by the organization culture[7]. Organizational culture can evolve based on a number of influences. Theo Farrell and Terry Terriff argue that organizational culture evolves as the result of "planned cultural change", "external shocks" and "military emulation"[8]. Of these three factors, military leaders can directly participate in planned cultural changes to meet organizational objectives.

Murray states that military leadership can affect the innovation process through long-term cultural changes rather than short-term decisions[9]. He provides a historical case regarding the efforts of General Hans von Seeckt to create a culture of innovation within the German Army in the 1920's.

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[3] David Schmidtchen, *The Rise of the Strategic Private: Technology, Control and Change in a Network Enabled Military* (Australia: Land Warfare Studies Centre, 2006), p 265.
[4] Williamson Murray, "Armoured Warfare: The British, French and German Experiences," in *Military Innovation in the Interwar Period,* ed. by Williamson Murray and Allan R. Millet (Cambridge: Cambridge University Press, 1996), p 45.
[5] Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Ithaca, NY: Cornell University Press, 1991), p 7.
[6] Elizabeth Kier, *Imagining War: French and British Military Doctrine Between the Wars* (Princeton, NJ: Princeton University Press, 1997), p 28.
[7] Dima Adamsky, *The Culture of Military Innovation: The Impact of Cultural Factors on the Revolution in Military Affairs in Russia, the US, and Israel* (Stanford, CA: Stanford University Press, 2010), p 18.
[8] Theo Farrell and Terry Terriff, "The Sources of Military Change," in *The Sources of Military Change: Culture, Politics, Technology,* ed. By Theo Farrell and Terry Terriff (Boulder, CO: Lynne Rienner Publishers, 2002), p 8-9.
[9] Williams Murray, "Innovation: Past and Future," *Joint Force Quarterly 12* (Summer 1996), 52.

According Murray, von Seeckt encouraged the study of World War I and instilled values within the officer corps that placed a high value on the analysis of changes in doctrine, tactics and technology[10]. As a result, von Seeckt created a culture that fostered critical thinking, open debate, detailed analysis and the development of new concepts of warfare. Though not being doctrinal rigid German officers were also tolerant towards failure. Murray argues that it is not possible to create a specialized military occupation, or institutionalize innovation. Instead, he proposes that military organizations enable innovation through cultural changes. Murray provides six recommendations for building a culture of innovation. These are summarized in the following[11]:

1. Think in terms of fighting real enemies and conducting exercises using realistic scenarios;
2. Influence operational tempo and exercises in order to allow commanders the opportunity to think;
3. Use lessons learned to challenge doctrine rather than simply validating it;
4. Give consideration to the development of measures of effectiveness at all levels;
5. Look for opportunities to continually enhance Professional Military Education (PME); and
6. Encourage non-linear analysis and conceptual thinking.

It can be concluded that building a culture of innovation within a military organization needs to foster trust, collaboration and open communication. This culture needs to build innovation networks and align professional development in order to inculcate innovative behaviours within future leaders.

3. Empirical framework

In the previous paragraph we have explored the first part of this paper's main question. We surveyed innovation and looked into what encompasses a culture of innovation. In this paragraph we will focus on design as an innovative concept. And have aim to find answers on the questions whether design is necessary and if it is innovative at all.

3.1 Design as innovative concept

Nearly all military missions this century will be complex, and the kind of thinking we have called "operational art" is now often required at battalion level. Fundamentally, operational art requires balancing design and planning while remaining open to learning and adapting quickly to change[12]. Nowadays commanders are faced with unfamiliar or ambiguous situations and may feel overwhelmed by uncertainty. It is there were design can help. According to U.S. Army doctrine, "design is a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them[13].

> "*A complex adaptive system has no single governing equation, or rule, that controls the system. Instead, it has many distributed, interacting parts, with little or nothing in the way of a central control*" John Holland[14]

John Holland[14]

[10] Ibid, p 53.
[11] Ibid, p 59-60.
[12] Brigadier General Huba Wass de Czege, U.S. Army (Ret.), Systemic Operational Design: Learning and Adapting in Complex Missions in *Military Review*, January-February 2009, p 2.
[13] United States, Field Manual 5-0, The Operations Process (Washington, DC: Headquarters, Department of the Army, 2010), p 3-1.
[14] John Holland, "Complex Adaptive Systems", Daedalus (Volume 121, Issue 1, Winter 1992), p 17.

In the modern day expanding disciplines of Social Science, Organizational Theory, Complexity Theory, and even Post-Modern Philosophy, many new ways to make sense of the world through new language, concepts and approaches challenge and dismantle traditional procedures. Yet for nearly all western military institutions, the transition from classical approaches remains a rocky endeavour thus far with strong institutional resistance. In the past decade Israeli, American, British, Canadian and Australian militaries have made various advances in military "design" thinking[15]. Accepting design thinking into a military institution requires us to restructure entire cognitive approaches, military education programs, and even challenge doctrinal tenets and long-held beliefs on military sense making (orienting and understanding) and decision making (directing, acting, adjusting). Changing how an organization thinks and makes sense of complexity is no easy task and requires more than mere adaptation.

Design is intended to be an iterative and innovative sense making process for focusing critical and creative thinking on complex military problems. Complexity features multiple aspects that are lacking in simplistic or even 'complicated' situations[16]. Namely, complexity has a wide (and growing) assortment of actors with many interconnections, and these connections continue to evolve in highly unpredictable and non-linear manners. By 'non-linear', this important complexity principle means that A+B does not lead to C (a linear causality logical process)[17]. Complexity features 'emergence' where complex patterns and processes transform over time, coupled with the previous tenets of non-linearity as well as the prominence of paradox. With paradox, opposing tensions become the norm in complex situations. One final element necessary in any definition of complexity is the tension between tacit and explicit knowledge. While anything explicit is easy to understand and share with others, tacit knowledge is extremely difficult (and at times impossible) to explain and convey[18]. Complexity features a high degree of tacit over explicit processes. Even Carl von Clausewitz promoted the associated notion that the 'genius' military professional might break all rules and become successful in ways that are very difficult to grasp or teach[19]. With so much said about defining complexity, how does this relate to design?

Design takes the shared position (with complexity theorists, social scientists, philosophers) that complexity resists any effort to control or understand it fully. Design offers the critical and creative reflection within this complex situation where we look at the paradigms that our military, political, and societal elements use. A paradigm is "the broadest unit of consensus within a science and serves to differentiate one scientific community from another. It subsumes, defines, and interrelates the exemplars, theories, methods and instruments that exist within[20]. When an organization or people

[15] Simon Murden, "Propose in Mission Design: Understanding the Four Kinds of Operational Approach" in *Military Review*, (May-June 2013). See also: Stefan Banach, The Art of Design: a Design Methodology", in *Military Review* (March-April 2009), p 106.

[16] Antoine Bousquet, "Chaoplexic Warfare of the Future of Military Organization", International Affairs (Vol. 84, Issue 5, 2008).

[17] John Holland, "Complex Adaptive Systems", Daedalus (Volume 121, Issue 1, Winter 1992), P 17. See also: Jerome Bruner, *Actual Minds, Possible Worlds* (Cambridge, Massachusetts: Harvard University Press, 1986), p 94-99.

[18] Donald A. Schön, Educating the Reflective Legal Practitioner, "*Clinical Law Review* (Fall 1995, Vol. 2:231), p 243.

[19] Carl von Clausewitz, *On War* (Penguin Classics, 1968), p 184. Clausewitz states that the military genius is not bound by rules or principles, and can artfully break them or create entirely new ones in warfare which becomes the nature of military genius in actions. It is the authors' position that Clausewitz, writing upon the paradigm-changing brilliance of Napoleon, used "genius" to help explain that one cannot simply make a list for others to follow that will imitate Napoleon and produce similar results.

[20] George Ritzer, Sociology: *A Multiple Paradigm Science* (revised ed.), (Boston: Allyn and Bacon, 1980), p 7.

within it choose a paradigm for making sense of a complex situation, the paradigm makes many implicit decisions about knowledge at the deeper, often implicit levels that subsequently interact and create paradox or tension with one another and reality[21]. Things become precisely what we *say they are*, events occur precisely as *we explain why they do*, and nothing could ever be anything but what *we know it to be* (within a chosen paradigm)[22]. Thus, when considering the complexity of a military situation, one must also critically reflect upon one's own institutional paradigm, and how that might be in tension (or in paradox) with a rival paradigm. Traditional military sense making largely accepts the various implicit choices that preferred military paradigm imposes upon complexity, *while design investigates them*. This is how design works remarkably differently, and cannot be shoehorned into a military step within overarching traditional decision-making procedure. Design is not, nor can it ever become a methodology underpinning a larger traditional worldview such as the preferred military paradigm[23].

Design first helps us appreciate the fact that military institutions want to define complexity in a particular way that caters to institutional self-relevance, and capitalizes upon how we want to define time and conflict. We tend to seek to simplify the complex, break things down through reductionism, and collect vast amounts of information[24]. We expect to gain clarity and greater control as time progresses and we analyse the data[25]. Western militaries attempt to engineer a military conflict and turn it into something controllable. Principles are coveted, rules and checklists become the preferred approach. Although doctrine stresses that it is merely a guide, in practice most professionals experience strong social pressure to never violate it[26]. Once solutions appear at the reduced level, we can re-assemble all of the parts back into the complex whole, much like a watch or car engine.

Western militaries predominantly function as powerful hierarchies, where technology, doctrine, and tradition drive decision-making into a hierarchical process of centralized authority and "top-down" directives[27]. In many environments and for many tasks, this is a highly effective and reliable process that gets consistent results. Returning to "complexity" and all of the associated factors within it, military sense making and decision-making within complex and uncertain environments demand creative solutions[28]. This is likely one of the most powerful motives for resisting design thinking in a military organization. Yet one cannot be very creative when decision making must travel up ivory towers.

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[21] Hayden White, *The Content of the Form: Narrative Discourse and Historical Representation,* (Baltimore: John Hopkins University Press, 1990), p 36.

[22] Peter Berger, Thomas Luckmann, *the Social Construction of Reality: A Treatise in the Sociology of Knowledge* (New York, Anchor Books, 1967), p 59.

[23] Wayne Grigsby, Scott Gorman, Jack Marr, Joseph McLamb, Michael Stewart, Pete Schifferle, "Integrated Planning: The Operations Process, Design, and the Military Decision Making Process," in *Military Review* (Kansas Fort Leavenworth, Jan-Feb 2011), p 15-22.

[24] Gareth Morgan, Images of Organization (SAGE publications, 2006), p 229. See also: Karl Weick, "Rethinking Organizational Design", in Managing as Designing, ed. Richard Boland Jr. and Fred Callopy (California: Stanford Business Books, 2004), p 47.

[25] Antoine Bousquet, "Chaoplexic Warfare or the Future of Military Organization", International Affairs (Vol. 84, Issue 5, 2008), p 920-922.

[26] Karl E. Weick, "Improvisation as a Mindset for Organizational Analysis" Organizational Science (Volume 9, No. 5; September-October 1998) p 551.

[27] Christopher Paparone and James Crupi. "The Principles of War as Paradox", Proceedings (Volume 131, Issue 10, 2005), p 39-45.

[28] Michel Foucault, "Discourse and Truth: The Problematization of Parrhesia", (originally covered in six lectures given by Michel Foucault at the University of California, Berkeley in October-November, 1983), available at: http://foucault.info/documents/parrhesia/

With implementing design one must accept that complex problems require complex or extensive solutions. Design doesn't enable one to forecast or dissect complexity. Design is more about feeling comfortable in dealing with fundamental uncertainty. It is about doing what seems right, now. Design is about the creation and exploitation of opportunities within complexity and opposes reactive chaos management. In most western militaries 'mission command' is used as doctrine. The author Stephen Bungay addresses mission command in business context as 'directed opportunism[29]'. The latter is very interesting because the meaning of the word opportunism entails: "The taking of opportunities as and when they arise, regardless of planning or principle[30]". When we combine this in context with design as the creation of opportunities within complexity one can see that design can be good fit in western way of warfare.

4. Analysis

Before analyzing the context I want to review what we have done so far. In the theoretical framework we have surveyed the fundaments of innovation and elaborated on establishing a culture of innovation. Subsequent we explored design and its context being an innovative concept. In this paragraph we will use the theoretical framework and project aspects of the empirical framework on it in order to formulate the context from which we can answer the main question.

4.1 Building a culture of innovation

Western militaries attempt to engineer a military conflict and turn it into something controllable. We tend to simplify the complex and break things down through reductionism, preferably within our known paradigm. Design on the other hand is an innovative sense making process for focusing critical and creative thinking on complex problems, though it is not a step within an overarching traditional decision-making procedure. Design requires us to restructure entire cognitive approaches, military education programs and it even challenges doctrine and long-held beliefs in sense making. Furthermore design requires inter-paradigm, creative and critical thinking. As already mentioned in the introduction, contemporary conflicts encompass the interplay of many variables and are more in need of an art than a science.

In the second paragraph we have stated that innovation constitutes change and that innovation in a military context applies to the development of new concepts, processes and structures. Major innovation renders the current paradigm obsolete and fundamentally change the way in which campaigns and wars are fought. Design changes how an organization thinks and makes sense of complexity. This is no easy task and requires more than adaptation, it requires innovation. In the second paragraph we also expound that organizational culture is a major enabler of military innovation. We defined the cultural model as the set of basic assumptions, values, norms, beliefs and formal knowledge that shape collective understanding. This model also fosters creativity, challenges the status quo and it engages in critical thinking. In the theory, Murray provided a historical case regarding the efforts of General von Seeckt creating a culture of innovation within the German Army in the 1920's. Though Murray argues that it is not possible to institutionalize innovation he provides six recommendations for building a culture of innovation.

I could easily put these recommendations in perspective with design and subsequently confirm them, however I will not. Murray's six recommendations are very practical and almost like a standard

[29] Stephen Bungay, The Art of Action: How Leaders Close the Gaps between Plans, Actions, and Results, Nicholas Brealey Publishing, 2011, p 54.
[30] Oxford Dictionaries available at: http://www.oxforddictionaries.com/definition/english/opportunism

operating procedure. If one would follow the six recommendations (bellow) a culture of innovation should occur:

- Think in terms of fighting real enemies and conducting exercises using realistic scenarios;
- Influence operational tempo and exercises in order to allow commanders the opportunity to think;
- Use lessons learned to challenge doctrine rather than simply validating it;
- Give consideration to the development of measures of effectiveness at all levels;
- Look for opportunities to continually enhance Professional Military Education (PME); and
- Encourage non-linear analysis and conceptual thinking.

If we ask ourselves how design can contribute in establishing a culture of innovation and look at these six recommendations we miss something essential. We are missing the driver for change. Design requires drivers like, inter-paradigm thinking, creative and critical thinking. If we examine the given example of General von Seeckt more carefully we can deduct drivers of change from Murray's example. These drivers are: critical thinking, open debate, detailed analysis, development of new concepts of warfare, prevention of doctrinal rigidity, and tolerance towards failure. Now we focus again on question: "How can design contribute in establishing a culture of innovation?"

Design provides (and demands) drivers such as critical and creative thinking. One of the major preconditions to do so is an open atmosphere and room for debate. New concepts and paradigms must and will be explored. In order to realise just that, one have to move further than known doctrine and concepts. Finally there must be way and room for failure and a way address the lessons learned and subsequent implement them. Together this contributes to a culture of innovation. When looking at the recommendations of Murray, with the drivers of change in mind. We can conclude that we have to implement the recommendations in a broader way. The first and second bullets are way too practical for design. The third however coincides with room for failure and implementation of lessons learned it emphasizes critical thinking. The fourth addresses that contemporary conflicts continually changes and therefore continuously require new measures and methods. This fits in well, since we have already addressed design as the management of opportunities. The fifth bullet exactly addresses what we call design thinking. It requires us to restructure entire cognitive approaches and military education programs. The final bullet is in a way the essence of design. Design is an art not a science; it is a fit for non-linear approach and conceptual thinking.

When putting the analysis together we can be critical on Murray's the six recommendations. They must not be approached as standard operating procedures. One has to deduce further and apply critical thinking. If we take the drivers for change into account in combination with the recommendations we can state that Murray's model fairly supports design in contributing to a culture of innovation.

5. Conclusion

Contemporary conflicts have become less predictive than ever before. This emphasizes that the world does not function in a mechanistic or deterministic way. Complex social interactions, fast changing complex threat environments and as such military innovation cannot be reduced to simple linear processes. The study and approach of these conflicts has become more of an art than a science.

This brings us to the purpose of this paper. My aim with writing this paper is to contribute in looking for answers on the question how a culture of innovation in the Netherlands Army can be created as an answer to the changing character of conflicts. This contribution focusses on the subject of design as innovative concept, in order to implement design as innovative concept a culture of innovation is needed. Because design nothing alike with the known linear models and current paradigm. So the main

question of this paper is: "*How can design as innovative concept for the army contribute in cultivating a culture of innovation?*" In order to answer this main question we have surveyed several aspects. First we have explored the theory of innovation and culture of innovation. Secondly we have looked into design. We determined what it encompasses, and determined whether it is innovative or not. Finally, in the analysis we have put it all in context. On this I will elaborate a bit more in order to answer the main question.

In the analysis we looked at design in comparison with the theory of innovation and concluded that design encompasses innovation and therefore can truly be addressed as innovative concept. On the other hand this doesn't say anything about design contributing in cultivating a culture of innovation. In order to answer this we have addressed the theory on organizational culture and combined it with Murray's recommendations for building a culture of innovation. From this analysis we concluded that Murray did not provide a good fit. His recommendations mere seem as a standard operating procedure for building a culture of innovation. The drivers for change were missing, when taking the (deducted) drivers for change into account we can state that Murray's model fairly supports design in contributing to a culture of innovation.

In order to answer the main question*: "How can design as innovative concept for the army contribute in cultivating a culture of innovation?"* We can answer that by implementing design as innovative concept a contribution is made in cultivating a culture of innovation in the Netherlands army.

Finally one might ask themselves what we gain with design as innovative concept contributing in cultivating a culture of innovation. It could contribute to an answer in dealing with the changing character of contemporary conflicts. At least design makes leaders think critically and enables them to feel comfortable in dealing with fundamental uncertainties.