

Planning Beyond Tactics: Towards a Military Application of the Philosophy of Design in the Formulation of Strategy.

A Monograph

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14. ABSTRACT This monograph sets out the philosophy behind a design approach to planning. The broad design theory is an amalgam of the Israeli concept of Systemic Operational Design (SOD), Effects-Based Approach (EBA) and Systems of Systems Analysis (SoSA) as a systemic design process that is complementary to existing decision making tools. The monograph elucidates the philosophical functions that are contingent to this process. The distinction between Form, Function and Logic has been embraced as the method used for explaining the philosophy of design. This builds on the writing of Deleuze and his 'philosophy of difference' and also in compartmentalizing between explaining the form of the design approach, from its functions and logic. The design approach produces more robust planning guidance, a frame of reference that enables reframing when the situation changes, an easily communicable strategy, across the whole of government and the explicit step of acknowledging our own biases and perspectives in shaping how we view the world. The conclusion of this monograph is not to replace MDMP and existing practices for planning or as a tool for decisions of implementation, but that a design approach is more appropriate for the creation of strategy, at every level, and concerns primarily decisions of consequence.					
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Abstract

PLANNING BEYOND TACTICS: TOWARDS A MILITARY APPLICATION OF THE PHILOSOPHY OF DESIGN IN THE FORMULATION OF STRATEGY by MAJ Edward P. W. Hayward, RHG/D, British Army, 79 pages.

The recognition of the failure at the strategic and operational levels of war during the Global War on Terror, specifically in Iraq, has resulted in a quest for intellectual solutions to complex operational and strategic problems. To date this has resulted in a tacit acknowledgement that the Military Decision Making Process (MDMP) is not equipped to tackle ill defined problems and that a complementary approach is required. The emphasis on problem framing as defining a problem has been the hallmark of this new approach that is facilitated through institutional learning and a process of reframing rather than the advocating of predictive solutions. This monograph does not attempt to evaluate these new processes or seek to incorporate them within existing doctrine. Instead, it sets out the philosophy behind a design approach to planning. The broad design theory is an amalgam of the Israeli concept of Systemic Operational Design (SOD), Effects-Based Approach (EBA) and Systems of Systems Analysis (SoSA) as a systemic design process that is complementary to existing decision making tools. The monograph elucidates the philosophical functions that are contingent to this process. Importantly, this is not a 'how to' manual providing a prescriptive approach, but an illumination, a theory of becoming that focuses on the *why* of the process, in order to offer a level of understanding. The distinction between Form, Function and Logic has been embraced as the method used for explaining the philosophy of design. This builds on the writing of Deleuze and his 'philosophy of difference' and also in compartmentalizing between explaining the form of the design approach, from its functions and logic. The design approach produces more robust planning guidance, a frame of reference that enables reframing when the situation changes, an easily communicable strategy, across the whole of government and the explicit step of acknowledging our own biases and perspectives in shaping how we view the world. The conclusion of this monograph is not to replace MDMP and existing practices for planning or as a tool for decisions of implementation, but that a design approach is more appropriate for the creation of strategy, at every level, and concerns primarily decisions of consequence.

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INTRODUCTION

“We ought to be seeking tentative answers to fundamental questions, rather than definitive answers to trivial ones.”¹

James H Billington

This monograph is not intended to be a prescriptive handbook on systemic design; such a product would be worthless, destroying the creativity that lies at the heart of this process. It does, however, seek to examine the theory behind a systemic design approach through the explanation of *Form*, *Function* and *Logic* as a method of reducing the existential crisis between what we expect to happen or exit and what we actually experience.² It will demonstrate that a design approach is not simply robust mission analysis, but the systematic creation of a *system* of reference which enables *reframing* and provides the foundation for plans of action.³ A design

¹ James H Billington, quoted in Colin S Gray *War, Peace and Victory: Strategic and Statecraft for the Next Century* (Simon and Schuster, NY, 1999), 9.

² *Form*: The outward expression, form of something that indicates its essence. The set of necessary and sufficient conditions for a thing to belong to the set of things to which it truthfully belongs. In Gilles Deleuze and Felix Guattari's, *A Thousand Plateaus*, 2007, form is a straight jacket for matter- the striated. Often the form of something is acted on in the misapprehension that actions will change its function. *Function*: The processes a form provides or delivers. How it relates to the constituent parts of an assemblage. *Logic*: The overarching aim or desire that guides the streams upon which a system operates. What gives meaning or logic to a system of form and function. *Stream*: A flow of events in time, an actor or agent, a movement, or any other tendency within a system to move in a certain, somewhat predictable direction if left unmolested. Potential energy in the system. Gilles Deleuze is a French post-structuralist philosopher. His work is outlined in *Difference and Repetition* and with Felix Guattari in *A Thousand Plateaus: capitalism and schizophrenia*.

³ *System*: A group of independent but interrelated elements comprising a unified whole: instrumentality that combines interrelated interacting artifacts designed to work as a coherent entity; a procedure or process of obtaining an objective; an ordered manner; orderliness by virtue of being methodical and well organized. A *Complex System* is any dynamic system composed of many simple, and typically nonlinear, interacting parts. A complex adaptive system is one whose parts can evolve and adapt to a changing environment. Normally involves biological or artificial intelligence components. *Systems Framing & Reframing*: Grouping independent but interrelated elements into a unified whole. Rationalizing strategic objectives in broad context and relating them to the specific context of the issue under study. *Framing*: A construct, either

approach is not seen as contrary to current planning methods but complementary as systematically setting the conditions for planning. Where this is currently practiced it occurs in an ad hoc fashion as consequence of the skill of both the commander and his staff. The design approach, as a prelude to planning, seeks to make explicit what is currently implicit. It creates room for questioning and the exploration of difference. It acknowledges the explicit distinction between decisions of consequence (the design of strategy), decisions of formulation (the quantifying of strategy) and decisions of implementation (the ordering of plans and operations). In this respect, the inclusion of operational in the title (Systemic Operational Design: SOD), often adds confusion to a process that ought best be applied to the designing of strategy rather than the creation of plans. The process does not replace the existing planning structure, but augments it, increasing the relevance of subordinate actions to both the desires of commanders and the environment they inhabit.

The first section of this monograph outlines the Form of design itself, as a verb. This will provide an illustration of the process enabling more detailed investigation of its Function later. Systemic design is not methodical, but a dynamic process that evolves and changes paradoxically, evading direction while delivering intent. As a Function it enables the process of *deconstruction* through the destruction and creation of *categories* that form our interactions with world.⁴ The

ontological or epistemological, but in both cases theoretical. A structure that provides a point of reference.

⁴ *Deconstruction*: The process of reading texts ‘against themselves’- to seek out contradictions and gaps. A form of analysis. It is not a synonym for reductionism as analysis through simplification, the withering down to the essential parts. In the philosophy of Deleuze and Boyd, deconstruction contributes to the process of disjuncture, taking apart at the joints and deconstruction of categories. It is followed by synthesis and the creation of assemblages. *Category*: Something that exists on its own, an ultimate class, the highest genera of entities in the world. Aristotle defines it as, ‘that which is neither predicted of a subject nor in a subject’. An attribute that can belong to entities of one category cannot be entities in any other category. For Deleuze, assemblages are systems that are constructed through the smooth relationship of exteriority. A design process creates ‘new systems’ that cross traditional categorical boundaries. In a pejorative manner, categories are contrasted to assemblages as representing ontological relationships rather than epistemological ones. See *essence*. In the philosophy of Deleuze (Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, 2007) assemblages are systems that are

ability to describe, *problematize* and then *frame* our evolving knowledge is the accomplishment of the design. A process achieved through the construction of a dialectic between the world we understand, from observation and action, and the world we desire. This includes identifying the distinction between our values and our interests and how these shape our perceptions.⁵ The Functional section introduces the various intellectual skills that are required. The benefit of this systems' structure is the recording of analysis and synthesis in a systemic fashion. This architectonic frame is malleable to change, evolutionary in nature and, therefore, illustrative, educational and adaptable when confronted with crisis, thus enabling reframing and support to subordinate planning. The final section outlines the Logic of design reexamining the meaning of operational art as distinct from the Operational Level of war. This monograph explores the nature of problem structuring and design development in the form of an *assemblage*, an amalgam of SOD, an Israeli developed campaign methodology and an Effects-Based Approach (EBA) to operations.⁶ Fundamentally, this monograph is concerned with a military application of the design approach, rather than with a specific theory. It is built on the foundation of the SOD construct developed by Operational Theory Research Institute (OTRI) but includes the Design Process (DP) developed as a variation to this theme at the School of Advance Military Studies

constructed through the smooth relationship of exteriority. This process creates 'new systems' that cross traditional categorical boundaries. In a pejorative manner, categories are contrasted to assemblages as representing ontological relationships rather than epistemological ones.

⁵ *Problematization*: The problematization (noun) is the link from a systemic understanding to the construction of the operational frame: the first act of 'design' and the expression of strategic choice. *Problematization* (verb): A [critical](#) and [pedagogical dialogue](#) or process that may be considered demythicisation. Rather than taking the [common knowledge](#) ([myth](#)) of a situation for granted, problematization poses that knowledge as a problem, allowing new viewpoints, [consciousness](#), reflection, hope, and [action](#) to emerge.

⁶ *Assemblage*: An ontological system created by a recognition of the processes that connect the lines of exteriority, intensive attributes. This is contrasted with generic systems, an exaggerated distinction, that are represented as the pattern of the lines of interiority, intensive properties. This may be an epistemological system, a categorical hierarchy e.g. amphibians, an abstract system that is a process of organization of knowledge, rather than an ontological relationship. The wasp-orchid is the example Deleuze employs. See *Heterogeneity*.

(SAMS).⁷ This *rhizomic* development is a consequence of the paradigm shift described by Thomas Kuhn and an example of Deleuzian assemblage.^{8 9} In this respect, the design process is fluid and evolutionary, a theory of becoming, an emergence not a product.

Language and Terminology.

Throughout this monograph technical language is used in a prescriptive fashion. This language is not a form of intellectual pretension, nor is it intended to restrict access. It aids communication by enabling terms to be cross referenced with authoritative sources. These terms do not come easily, as with any technical terminology.¹⁰ As with learning any new language, translation can only be attempted after the original language has been mastered. There are no shortcuts to this process, and fluency requires not only a working knowledge of the vocabulary but also the employment of grammar. To enable comprehension ambiguous words are highlighted in *italics* with a definition included as a footnote to aid the reader. A glossary of terms is included in appendix 1.

⁷ School of Advanced Military Studies (SAMS), at the Command and General Staff College, Academic Year 2007-2008.

⁸ *Rhizome*: A decentralized multiplicity or network. There are 6 principles of a rhizome: connection; heterogeneity; multiplicity; ‘asignifying rupture’; cartography; and decalcomania (a process not a model). Two multiplicities can form a rhizome: the wasp-orchid. A root structure that is used by Deleuze to contrast the linear hierarchy of arborescent (tree like) structure of branching hierarchies. Flat organizations are more rhizomic than monarchies which are arborescent. The natural order within multiplicities and rhizomes: jumbled-together, mixed-and-matched. Rhizomatic assemblages connect heterogeneous elements but leave them that way so that each retains relative independence and can be plugged simultaneously into other rhizomes. They are without beginning and end.

⁹ Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1996), x, 10-11

¹⁰ It is possible to debate the merit of an editor or translator imposing their vision as a simplification of complex ideas. In many cases, such explanation would take many paragraphs and loose translation as the complex interconnected smooth intent is dissected into a striated-communicable interpretation. This is not a consequence of skill but process. This systemic form of education requires for the reader, the employer of these concepts to determine whether they are worthy of the flash of inspiration conferred here or a black-hole obscuring of complex ideas. Ed. James Der Derian in *The Virilio Reader* (New York, NY: Blackwell Publishers, 1998), 7.

Acknowledgments.

This monograph is the product of individual reflection built on the foundation of group instruction and discourse. Where original ideas exist, they are a result of conversations and attempt to express an alternative understanding or to explore someone else's understanding of the design process. This took place throughout the Advanced Military Studies Program (AMSP), at the Command and General Staff College, Academic Year 2007-2008. The class developed their own Design Process (DP) as a variation of the SOD theory set out by Brigadier General (Reserve) Shimon Naveh, of the Israel Defence Force (IDF), former chief of the IDF's OTRI. This monograph is not a record of the group process that is captured in the group monograph.¹¹ I should, however, like to acknowledge the contribution of all members of the group who encouraged me to dig deeper into understanding the theory and in attempting to forge a way forward. I should particularly like to thank Majors Chris Robertson, Mark Bloome, Jeff James and John Nalls for their extended patience. I am also indebted to the senior mentors throughout this course, led by U.S. Brigadier General (Retired) Huba Wass de Czege. A special mention is reserved for Brigadier General (Reserve) Shimon Naveh whose work was the catalyst for this monograph. His extended tutoring and advice are, I hope, not paid a disservice by my work. This monograph is not intended as an apologia for the theory of SOD. It is intended as an accompaniment to any future student who wishes to understand this approach to operational design and a military application.

¹¹ John Clark, Edward Hayward, Jeff Powell, Mark Beckler, etc Group Monograph, SAMS, April 2008.

FORM

“It seemed that the next minute they would discover a solution. Yet it was clear to both of them that the end was still far, far off, and that the hardest and most complicated part was only just beginning.”¹²

Anton Chekhov, *The Lady with the Dog*

A Structure for Learning.

The British military theorist, Basil Liddell Hart wrote that “the object of war is to attain a better peace.”¹³ The heart of a design theory is embedded in the concept of choice expressed through problem construction. This relies on the identification of *potential* within a system; its natural *emergence*, and the exploitation of this understanding as a tactical route to strategic success in relation to our national desires.¹⁴ This is not a theory that is proposed as a hypothesis to describe how the application of force will translate into victory, it is far more subtle than this, relying on linking latent potential within a system instead of imposing expectations through actions.¹⁵ As a base principle this theory structures a pattern of learning to provide a cradle of *systemic understanding* within which a design hypothesis can be constructed prior to planning.¹⁶ This subordinate procedure is complimentary and further extends the learning function enabling continued adaptation and reframing. It does not regard operational art as the intellectual foundation upon which the theory of victory rests, but includes operational art as present in both

¹² Quoted from Bryan Lawson, *How Designers Think* (Oxford: Architect Press, 2006), 53.

¹³ B. H. Liddell Hart, *Strategy* (Meridian, Penguin Books, London, UK, 1991), 353.

¹⁴ *Potential*: The possible occurrences, good or bad, that are a result of a stream or the convergence of streams. Potentials may be exploited within the system to bring the system to an acceptable state of operating. Related to *Desired System State*. *Emergence*: Movement or direction of a system within the framework that manifests a new potentiality within the overall system. Emergences may be positive, helping the friendly systems to achieve their desires, or negative, threatening the movement of friendly systems in their desired direction.

¹⁵ Eliot Cohen, *Supreme Command*, (New York, NY: Anchor Books, 2002), 263-264.

¹⁶ *Systemic Understanding*: This is the metaphysical investigation that leads to the creation of new assemblages as the presentation of ontological reality. While it is a mental creation, a product of the observer, it is epistemological, but not as a category applied to the world as authoritarian structure. It is a form of emergence.

the execution of design as a verb and in the implementation of a design as a noun.¹⁷ It transposes strategy within tactics as the acme of operational art. This is in contrast to the more obscure, traditional view that expounds operational art as the practice of alchemy that translates tactical action into strategic success; a metamorphosis of substance against the laws of physics.

A Philosophy of Difference.

The process of design is about the recognition of difference; internal difference as *essential* identity, a consequence of flux rather than circumstantial difference, a *predicate* of identity.¹⁸ This recognition occurs following reflective thought.¹⁹ This is not as obvious as first impression may indicate. Reflective thought is not merely thinking. It requires the tenacious application of cognitive faculties, acute observation, and a familiarity and ease with ambiguity. In every sense design is philosophy embracing ever-increasing complexity. Thinking should be regarded as a skill rather than a gift. The recognition of this is itself the first step necessary to improve this skill.²⁰

¹⁷ William E. Young, Jr, Major, USAF, JFACC as Architect: Using Systemic Design to create Options in a World of Wicked Problems, SAASS, Maxwell Air Force Base, June 2006.

¹⁸ *Essence*: The set of necessary and sufficient conditions for a thing to be a member of the set of things to which it truly belongs. In the philosophy of Deleuze and DeLanda essence is replaced with the thought attuned to intensive properties through the lines of exteriority heterogeneity. A nomadic essence. Equivalent to 'thing' or 'individual' (as opposed to properties or relations), or reality (as opposed to appearance). Originates from Aristotle's notion of 'nature', 'essence' or 'being'. In Deleuze the lines of exteriority that forms the beginning of a process of stratification. In contrast to *predicate*. See *category*. *Predicate*: From formal logic, the science of correct reasoning. That which is predicated of the subject of a proposition; the second term of a proposition is predicated of the first term by means of the copula- "Socrates is a man, predicates the manhood of Socrates". In this respect, the predicate is that which is determined by an early condition. For Deleuze the separation of predicates from categories is part of his philosophy of difference and the separation of presentation (the subject) from the representation (the proposition that is affirmed or denied about the subject). The consequence, or second order of an ontology, the relating or underlying condition. Relating to the rule of language; from Chomsky's theory of transformational grammar- with deep structure and surface structure. In logic, the distinction between *categories* and *predicates*.

¹⁹ From John Dewey *How We Think*, (Prometheus Books, NY, 1991), 1-14 and in the *Nature of Reflective Thought*, 6-12.

²⁰ Edward de Bono, 'Practical thinking' in Bryan Lawson *How Designers Think*, (Oxford: Architecture Press, Elsevier, 2006), 3.

Central to a systemic approach is the philosophy of Deleuze and his conviction that philosophy is a matter of posing questions, to learn about a system, rather than proposing solutions. This approach, the cornerstone of design, is manifest in the employment of *meta-questions*; a process of questioning that enables designers to stand outside their environment and critically observe their methods, their knowledge and the gaps in both.²¹ Through this posing and answering of questions (meta-questions, almost questions about questions) the design is taken forward through the recognition of difference. It would be a wrong to interpret this approach as the relegation of solutions themselves. However, it is intended to elevate the requirement of starting from a well-stated problem; one that is framed. This is both theoretical and practical; the construction of a problem, problem proposition, is a conscious activity and is “like the conquest of freedom”.²² ²³ An investigation that begins with the ‘quest for a solution’ has already been oriented and lacks the freedom of choice, without this, “we are kept in a kind of slavery. True freedom lies in the power to decide, to constitute problems themselves”, otherwise problems have the solutions they deserve.²⁴ In this respect Deleuze is concerned with the intellectual approach we adopt when we view the world and abstractions as ‘problems’. An approach that deconstructs is a catalyst to the next level of understanding; the level of *ontological* identity as *presentation* not *representation*.²⁵ This is expressed in the construction of a systemic frame. This frame is a

²¹ *Meta-questions*: The process of asking questions that help structure learning. These enable the designers to stand outside the method and observe the process, their understanding and identify gaps in both. The development of answers to these questions takes the process further. It is part of the describe, problematize and frame continuum.

²² Gilles Deleuze, *Bergsonism*, p.16 quoted in John Marks, *Gilles Deleuze*, (London: Pluto Press, 1998), 23.

²³ The development of the term ‘problem proposition’ is the result of work conducted by Majors John Clark and Kareem Montague and replaces the problematization, as a process, as it is explained in this monograph. This is a necessary reduction in the more theoretical concept explain here and it is seen as a necessary step in order to gain wider acceptance.

²⁴ Deleuze, *Bergsonism*, p. 15 quoted in John Marks, 23.

²⁵ *Ontological*: The theory regarding what exists and the enquiry into its nature, the philosophical study of being. The relation between categories and attributes. It is used throughout this text to signify the existence of assemblages as they are presented through their relations of exteriority. This is contrasted to categorical systems that are expressed as the relation of

mental construct that presents our understanding of the world. Deleuze provides the philosophical concepts for a modern critique of a world constructed from fragmented Euclidean space, twisted Aristotelian time, and non-linear Newtonian physics.²⁶ John Marks observes, “Deleuze provides such an ontology by examining the self-ordering and emergent properties of material systems. . . and sets forth the basic concepts that make sense of the world as it must be to provide the results elicited by *complexity theory*.”^{27 28}

The Segregation of Problem Solving, Decision Making and Planning.

This design approach represents a paradigm shift in the culture of military planning. Hitherto, the institutional *raison d'être* has been to train individuals to act counter intuitively as a group in dangerous, confusing situations through the application of standardized, automated

interiority and a mental, epistemological construction. See St. Anselm's Ontological argument for the existence of God: as God is conceivable as omnipotent, as a necessary, rather than contingent existence, then God exists. In Deleuze the emphasis is on 'becoming' rather than 'being'. Ontology is dedicated to immanence rather than transcendence. The duality or binary nature of the philosophy (smooth and striated; nomad and sedentary; rhizome and tree) is heuristic and invoked in order to challenge one another, not a construction, but a necessary process through which they pass. *Presentation*: The ontology of sense experience and impression unadulterated by assumption or expectation. An assemblage that depicts the relationship through processes of exteriority, rather than relations of interiority as categorical attributes. Ontological reality, the presentation of the essence of a thing. The assemblage that presents the intensive processes as captured by the lines of exteriority that form assemblages. *Representation*: The mimicking of ontological reality, replication of something through the depiction of its interior qualities (accidents), rather than its exterior qualities (essence).

²⁶ For our purpose this deconstruction enables the operational artist to view the world outside the prescription of space, time and causal physical relationships. This is the process that gives validity to the cliché of 'thinking outside [of] the box'. The mental limitations of the box are categories of our own creation. This is not meant to abolish the laws of physics or ethical and legal constraints but illustrates how a philosophical perspective is required to assemble a new world view, to create new solutions to old problems. Specifically with regard to military planning, it is a rejection of the more linear pattern of effects planning and the establishment of end states that are viewed as concrete mile stones to be achieved, regardless of the emergent conditions within which makes them relevant.

²⁷ Mark Bonta and John Protevi, *Deleuze and Geophilosophy*, (Edinburgh: Edinburgh University Press, 2004), vii-viii.

²⁸ *Complexity Theory*: The theory relating to any dynamic system composed of many simple, and typically nonlinear, interacting parts. A complex adaptive system is one whose parts can evolve and adapt to a changing environment. Normally involves biological or artificial intelligence components.

responses. At the intellectual level this has focused on the development of decision making skills, specifically decisions of implementation rather than defining problems of consequence. Colloquially, soldiers have been encouraged to ‘offer solutions *not* problems’. Design advocates an inversion of this process, a *drifting* from decision making to problem structuring.²⁹ Each is regarded as being profoundly different. Design creates room for decisions of consequence, for free choice and escapes a prescriptive approach. Systemic methodology provides a frame that includes both the emergence of assemblages as the starting point for analysis and as a revised culmination of synthesis.

This recognition contributes to problematization which aides in the transition from the systems frame to the creation of an operational frame. This second frame represents the *striated space* of strategic choice.³⁰ Design then becomes the *smooth* exploitation of this space to deliver an agreed, refined need to the *sponsor*, or commander, within the striated space of the operational frame.³¹

Striated space can be summarized as the emphasis of form above purpose, the imposition of categorical distinctions. Smooth space is an expression of the deconstruction of this form

²⁹ *Drifting*: This concept is taken from urban architectural theory. Drifting is the phenomenon of the novel use of space not as the architect had originally intended. The example of dockland warehouse conversion into modern housing is ideal. The significance of the drift, is not simply the changing in form of the building space. It is the metamorphosis of the function and logic of the environment. The entire area is transformed, the use of space change, the character evolves.

³⁰ *Striated Space*: As opposed to smooth, it is better to speak of an interchanging between the two. Striated space is first gridded and delineated, then occupied, by drawing rigid lines that compartmentalize reality into segments. All controlled to a greater degree or lesser extent through a nested hierarchy of centers. It is composed of centers, the idea that there are places of more and less importance. It imparts ‘truth’ and the notion that an immobile point is better than ‘aimless’ voyage: the migrant versus the nomad. *Smooth Space*: The space of intensive process and assemblages, as opposed to striated space of stable systems. The form of expression of the nomad. Emergent properties, intensive becomings occur only in smooth space. It is uncontrollable by definition. It can be encircled, but as its qualities are made static they recede under the force of striating order.

³¹ *Sponsor*: This term is used to denote the combination of the political decision maker and the function of the higher military commander. The paramount concept is the function of decision making, rather than legal power or authority. The purpose is to discourse with the originator of strategic needs, wants and desires.

through a synthesis of understanding captured in the logic of an assemblage. Striated is not *bad* and smooth is not *good*, in a normative sense, the two create a dialect, and function together analogous to skeleton and muscle. Smooth logic extends beyond boundaries to create new solutions. In military terms it is the fracturing of the rival's logic through action that protects the friendly form and function. This may be achieved through the reorganization of friendly form and the adoption of new or nontraditional functions as routinely expressed in Special Operations Forces (SOF) operations. Any unit is capable of smooth action, it simply requires flexibility from striated thinking and a restriction of form and function as expressed by doctrine.³²

Critical to this process is the distinction and separation of problem identification (including the hierarchy of identification, framing or setting and solving), decision making and planning. Although complementary to one another, these have hitherto been grouped together in the Military Decision Making Process (MDMP).³³ The systemic design approach offers more than reinforced mission analysis. It provides a structure of investigation that becomes the foundation for planning and a base from which to reframe as the situation develops. The benefits of a design are more exaggerated under conditions of reframing than in the production of the initial design.

³² For a complete example of the contrast and contribution of the appreciation of smooth and striated space refer to Brig Gen Shimon Naveh's article, *Between the Striated and the Smooth Asymmetric Warfare, Operational Art and Alternative Learning Strategies*, included as appendix 2.

³³ U.S. Department of Defense, *U.S. Army Field Manual 5-0, Army Planning and Orders Production* (Washington, DC: Government Printing Office, 2005). This process requires problem solving to be completed prior to MDMP commencing, and is explicitly addressed in Chapter 2. However, given the nature of increasing complexity confronting military tasks, this distinction should be emphasized and different tools and methods adopted to address these different requirements.

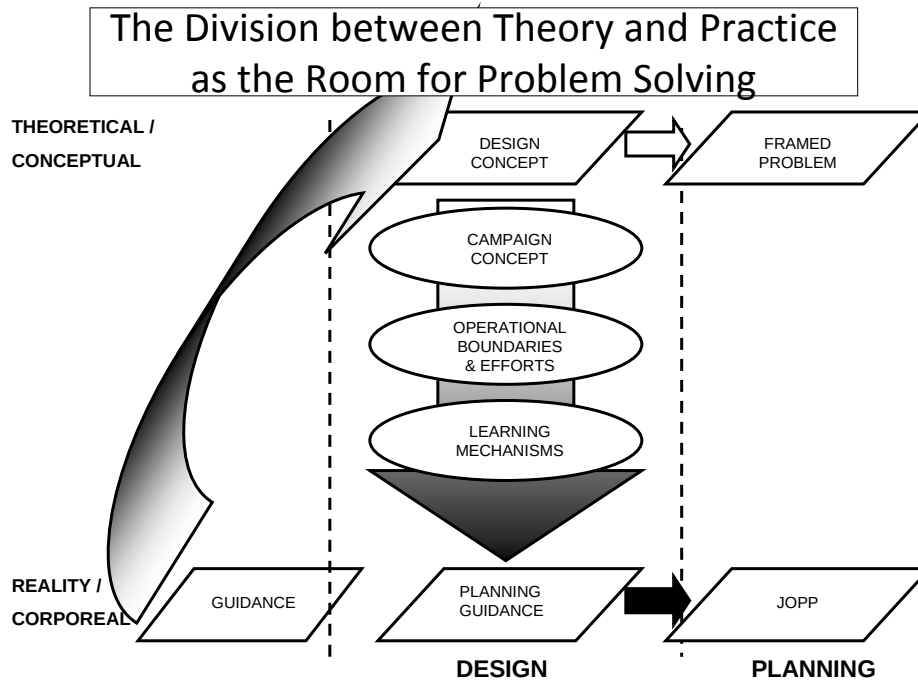


Figure 1. The difference between strategy and planning is represented by the space between theory and practice. This distinction creates a role for design, as a prelude to planning.

The Emergence of a New Mental Paradigm of Assemblages.

A systemic approach is built upon the identification and exploitation of the differences and tensions between the Form of Function and Logic, between matters of fact and patterns of ideas, between induction and deduction. These tensions emerge as a result of our freedom from mental illusions; it is the ontology of a processes (relating to how things are in the world) rather than the ontology of a problems (relating to how things are in the mind). The development of meta-questioning challenges not reality but our concept of reality- it resides above and before, surrounding and embedded within the friction between the subjective plan and objective actions. Deleuze proposes a systematic inversion of the traditional *metaphysical* relationship between identity and difference, between understanding and experience.³⁴ These are no longer the effects,

³⁴ *Metaphysical*: Part of the Philosophy of Science (epistemology and ethics) questions relating to reality. What is fundamental in the order of knowledge, explanation and existence; the study of reality as opposed to appearance; what transcends experience. Relying on the a priori

the consequence of experience, *empiricism*, but rather the reverse; knowledge is the consequence of experience and identities are the effects of difference.³⁵ Through the process of shattering our categories of knowledge we grasp the world as it is, ontologically, rather than in the abstract and artificial forms of mental categories. These new systems are expressed as assemblages, the product of our pattern of learning, identified in newly defined pattern of space, and requiring a new pattern of language.

Problematization, the noun, emerges as a consequence of meta-questioning and the destruction of our ‘problem framing’ *einstellung*, representing striated thought.³⁶ The synthesis of these tensions, between the world as it is observed and the word we desire, creates a new system of assemblages transcending categorical definition. Without the ability to work outside the boundary of knowledge and structure new thought, through developing ‘lines of *exteriority*’, it is harder to transcend the subject of observation, and the organic totalities we have inherited.³⁷ Deleuze defines the characteristics of these assemblages as their ability to be detached from their existing system and plugged into different assemblages in which their interactions are different. In other words, the exteriority of relations implies a certain autonomy for the terms as they relate.³⁸ Assemblages are still systems, but they are systems of deliberate choice, the expression of relevance. They are presentations of ontologies as observed in the world based on the process

rather than empirical method. A new way of thinking about the world that is a presentation of the world, in contrast to a representation of the world, a mental abstract construct.

³⁵ *Empiricism*: An argument that follows from experience, inductive. A conclusion that is contingent on conditions (empirical) and therefore not necessary.

³⁶ *Einstellung*. The frame of a problem is the set of assumptions and attitudes with which you approach it. Making assumptions about possible solutions to a problem can be a barrier to creativity and compound difficulty. These limits are a self-imposed rigidity; they are the frame of the problem- the *einstellung*.

³⁷ *Exteriority*: The condition of being outside a boundary, known but not yet captured. Belonging to the outside world, but not of one’s exclusive domain. In thought, the action of the war machine, whose smooth thought attacks the form of interiority of state thought. Not an opposition, but a force, outside thought is a force that destroys.

³⁸ Manuel DeLanda, *A New Philosophy of Society; Assemblage Theory and Social Complexity*, (London: Continuum, 2006), 10-11.

of function rather than on categories of *interiority*.³⁹ It is expressed in *A Thousand Plateaus* as the war machine, whose ‘form of exteriority’ attacks the form of interiority of the national institutional thought by ‘situating thought in a smooth space’.⁴⁰

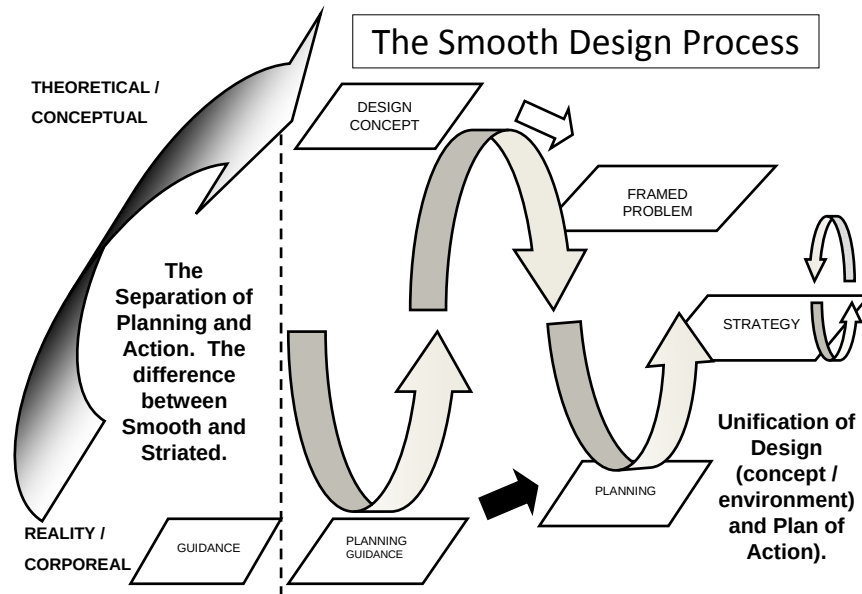


Figure 2. The design approach as a reflection of the implementation of strategy in tactics. The design of strategy unifies the smooth and striated concepts in one action.

Design emerges as questioning, understanding and acting on a single plain; transposing strategic intent into tactical action in more than words. The awareness of the difference between smooth and striated enables a change to our problem solving processes, to bring about a unification of the theoretical and practical, combining strategy and tactics. Through a process of thinking and acting within the same realm, a conceptual and consequential relationship is created through links that hitherto did not exist. This is the exposition of smooth, as opposed to striated, thought and process.

³⁹ *Interiority*: The condition of being capture by a stratum, in contrast to Exteriority.

⁴⁰ Delleuze & Guattari, *A Thousand Plateaus*, (Minneapolis: University of Minnesota Press, 1987), 376-377.

Design as a System of Systems.

The design approach establishes a system of systems that provides a structure for reframing. A structure is of benefit to the military planner as it establishes logical links connecting policy decision of consequence with tactical decisions of implementation. A hierarchy of assemblages are created from the generic to the specific: System Frame, Operational Frame and Strategy. These assemblages are produced through the destruction of categorical systems: Political, Military, Economic, Social, Informational, Infrastructure (PMESII), and the synthesis of their parts into the creation of new systems. Each level has an ontological identity but interacts as a system of systems.

A systemic creation is achieved through learning as a sequence, a sequence that is structured by describing, problematizing and then framing. This process is iterative through a pattern of discourse, between a design team and a sponsor. It occurs throughout the process and is not segregated with the formulation of a particular frame within the hierarchy. In its entirety the process describes the Form, the 'what' of a given system. This is given explanation and relevance through the Functions which it provides explained by the Logic of the system which binds all three in the assemblage. These connections are explained in more detail in the Function chapter which covers the creation of assemblages and in the Logic chapter which introduces general systems theory.

The Process of Dialogue and Discourse.

Throughout this methodology, the designer should view his purpose as a translator. His is the prism through which strategic direction is turned into strategic desire through the unmasking of what is implicit. Discourse is the enabler of this process; a logic that views discourse as a learning engagement, sometimes a violent encounter. It is egalitarian, all participants share an equal voice but conversations need not necessarily be symmetrical. The design process as a whole can be viewed as a narrative, between the sponsor with his discussion

of needs and the relevant environment with its limitations of potential. The designer seeks clarification from each in order to explore the use of space between the two. Conversation rather than briefings are the central format supported by sketches and diagrams. To assist the capture of complexity and ease communication, written narratives are employed at the key framing occasions: the systemic narrative, problematization and the strategy narrative as the concept of operations. These narratives serve two functions. Firstly, they communicate understanding and adjustments to the sponsor. Second, they provide a platform to elicit new criteria to drive the design forward. In this process, the sponsor guides the designer in his understanding of goals and needs within the world and the designer guides the sponsor in understanding the character of the space, the environment, and possible forms of intervention. A strategy translates these desires into a format that provides a frame for subsequent planning. The level of specificity, both of the dialogues and of the strategy vary according to the nature of the environment and the situational awareness of those taking part.

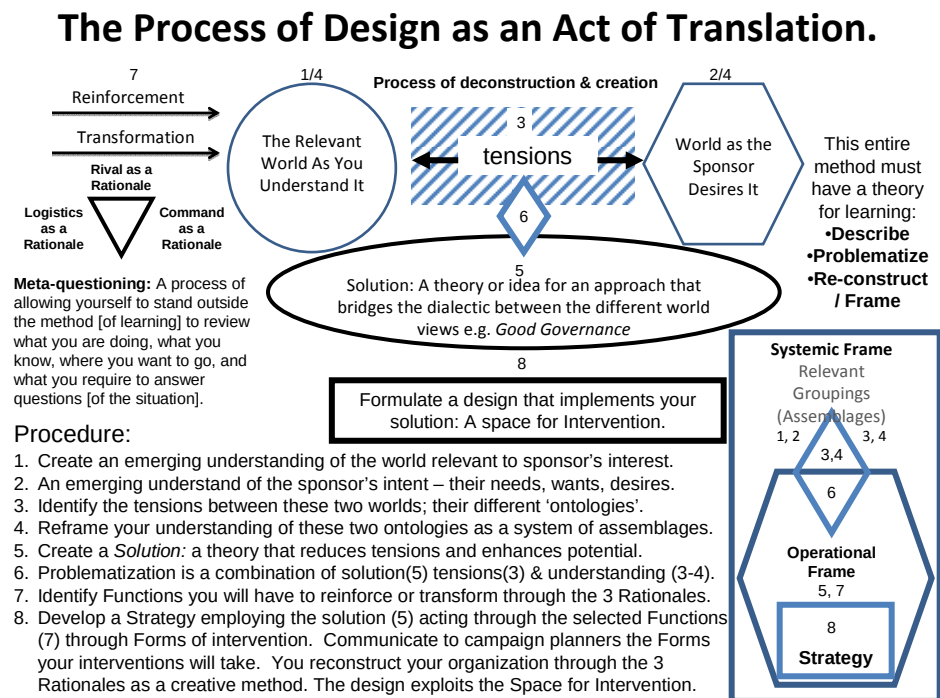


Figure 3. The metaphor of translation as an illustration of the 8 steps of design.

The designer must understand the strategic sponsor's desires and his commander's intent. The design team requires humility to engender a mutual perpetuation of learning. Discourse is not about winning, it is not debating, but rather presenting an alternate point of view to enable a decision. The purpose of the initial dialogue is to enable the designer to include the sponsors intent, rather than direction (if the two are distinct) as part of his systemic understanding: the macro frame. The sponsor may have communicated his intent in the language of traditional operational design: termination criteria, ends state, center of gravity etc.⁴¹ A sponsor's direction may be different from his actual desires or needs. The design team may more accurately depict the problem through examining the sponsor's direction to make sure they have understood it correctly. This contributes to the framing of the problem (Steps 1-4 in figure 3). The aim is to make explicit what the sponsor intends implicitly. The process (Form) is less important than the purpose (Logic) of the dialogue. A knowledgeable designer, one with relevant subject matter expertise, must be cautious not to analyze the sponsor's desires at this stage as they will have little systemic understanding to support any redirection. The end of this stage will see the reframing of the sponsors direction, having a systemic understanding that acknowledges his needs.

A System Frame of Assemblages.

The system frame is the point of reference from which the design is built. Its purpose is to create an emerging understanding of the world relevant to the guidance from, not formed solely by, the sponsor's intent (Step 1 in figure 3). Although simply stated, the ability to be alerted by a sponsor's guidance to an issue is quite separate from being driven by this guidance in the

⁴¹ US Army doctrine outlines 11 elements of Operation Design: Joint Publication (JP) 1-02: *Department of Defense Dictionary of Military and Associated Terms* (Washington D.C.: U.S. Government Printing Office, 2001, as amended through 2007), 394. Also found in Joint Publication 3-0: *Joint Operations* (Washington, D.C.: Government Printing Office, February 13, 2008), IV-3. Field Manual 3-0: *Operations* (Washington D.C., Department of the Army, 2008), 6-1.

designer's approach to the problem. The system frame provides the fresh approach to a problem, it is the problem setting that allows the problem to be created, it provides the freedom for the designer to provide new solutions (Step 2 in figure 3). The frame is a produced by creating new assemblages. The emerging understanding of the design team is contrasted with the raw desires and needs of the sponsor in order to identify the tensions between the two (Step 3 in figure 3). The recognition of these tensions enables both views to be refined through reframing (Step 4 in figure 3). As a whole process this creates systemic understanding, communicated in a narrative, that frames the approach of the design team and the sponsor to the emergence.

This process requires reflective thought to initiate the selection of the assemblages. The presentation of the groups' systemic analysis provides the input for the initial discourse. It is not a conclusive process and the systemic understanding evolves as the designers learn and their understanding changes, including the type and nature of the selected assemblages. The assemblages are selected following an identification of the *intensive* properties within the environment.⁴² These are then *reterritorialized* to form *emergent* assemblages that are the initiation for systemic analysis.⁴³ These assemblages are smooth, the lines of *heterogeneity* that link them as emerging assemblages do not form a binding, but bonding function that is a product

⁴² *Intensive*: The internal properties of a system with regard to its immanent relations (density, boiling point of water). In contrast to extensive properties that are defined by an external measure or standard (length, volume). Extensive properties are divisible without a qualitative change in the underlying system. An assemblage is the relationship between intensive, internal properties, and changes to these multiplicities results in qualitative change. Deleuze's ontology claims that intensive morphogenetic processes give rise to actual or stratified entities whose extensive and fixed properties are the object of representation, and occlude the intensities which gave rise to them.

⁴³ *Emergence*: Movement or direction of a system within the framework that manifests a new potentiality within the overall system. Emergences may be positive, helping the friendly systems to achieve their desires, or negative, threatening the movement of friendly systems in their desired direction. This relates to 'assemblages of becoming' in Deleuze. *Reterritorialized*: The process of forming new territory, never to return to an old territory. Used by Deleuze to depict the becoming of multiplicities.

of understanding- metaphysical not *epistemological* concepts.⁴⁴ These assemblages evolve as understanding increases and the changing sponsor's desire force adaptation. This process begins the inversion of how experience shapes knowledge and the transformation from striated desires and categories to smooth systemic assemblages. The relationship between the frames is depicted figure 4.⁴⁵ This illustrates the processes that occur between each level and the function of the frames themselves. It is nested with the processes in figure 3, listing the 8 steps.

Assemblages are not the same as PMESII etc. These mental categories are one step removed from the world they are trying to reflect; they are representation. One exists in reality, is experienced, the other is an artificial structure that is applied to the world and regarded as part of it; representation masquerading as presentation. Assemblages become the conclusion to a theory of the patterns of fact. In form, function and logic they record the processes, intensive qualities, contained within the assemblages as systems. The assemblages are constructed by the design team and function as lenses through which a systems approach is applied for the design to transform certain aspects as part of a system of systems.

⁴⁴ *Epistemological*: The philosophical study of knowledge, the production of a certain set of criteria by which something can be said to know something. In systemic approach epistemological is used in contrast to ontological as something which has merit in the ording of information rather than necessarily in the representation of who the object is present in the world. These mental conventions are useful in everyday life, but are representation rather than presentation of reality, and are one step removed. In the design perspective they provide a less ideal platform for design. *Heterogeneity*: Natural order within multiplicities and rhizomes: jumbled-together, mixed-and-matched. Rhizomatic assemblages connect heterogeneous elements but leave them that way so that each retains relative independence and can be plugged simultaneously into other rhizomes. See *assemblage*.

⁴⁵ Created with Major Jeff James, U. S. Army.

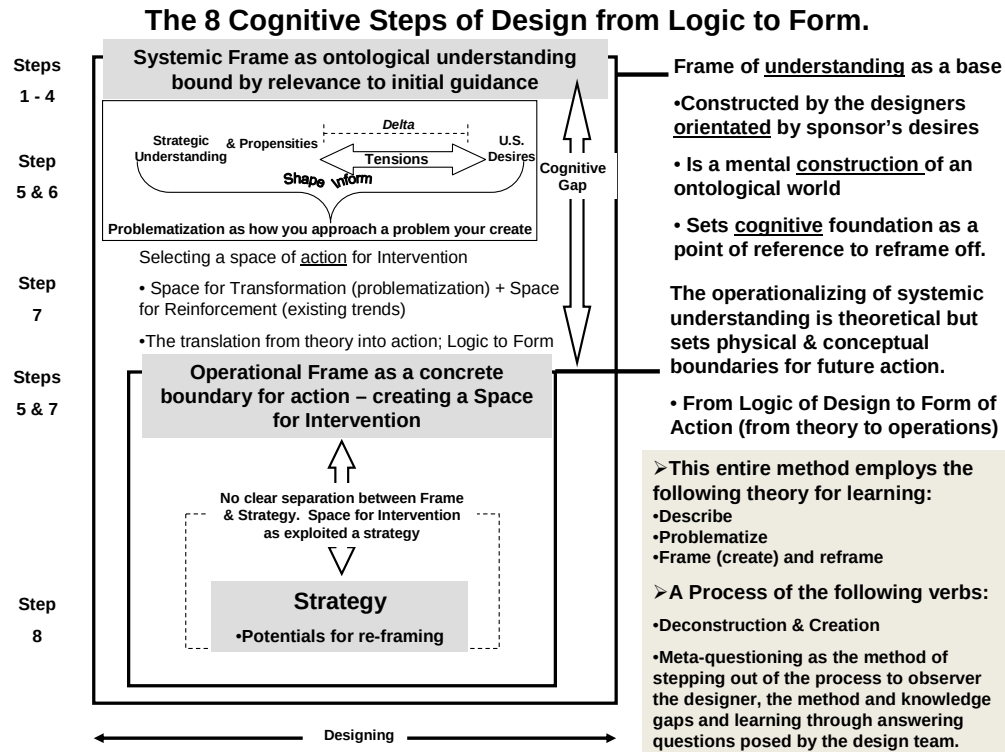


Figure 4. An illustration of the theory and how it relates to the concepts of systemic frame, operational frame and strategy as the three strata of reference.

Problematization.

Problematization enables the transition from an understanding of the world based on what is observed, as a product of our own orientation (mental biases), and the creation of an abstract construct that explicitly acknowledges how we should approach this undesirable situation through its own latent potential (step 6 in figure 3). The design approach accommodates a theory of learning where problematization, as a verb, exists as the bridging tool from describing to framing; it is the heart of design as a system of inquiry including the proposition of a problem as well as the development of a possible solution. It helps move the design from Logic to Form, from theory into action through the posing of questions that reveal tensions, defining mental approaches, and developing mental tools as meta-questions creating boundaries. The problematization narrative, helps communicate the move from systemic understanding to the creation of the operational frame (steps 5 & 7 in figure 3). This narrative is as much about the

designer and his culture, as it is about the emerging situation. This approach embraces the essence of the Stoic philosophy, it “is not events but our opinions about them, which cause us suffering.”⁴⁶ It is the conceptual depiction of the tensions observed between the two world views (steps 1-4 in figure 3) and the creation of a solution (step 5 in figure 3); the forming of a hypothesis. This hypothesis may involve the development and change of your mental approaches or attitudes to emerging ‘problems’. This is not to be confused with the identifying of ‘problems’ which exist as epistemological categories. Problematization is the stepping stone between matters of fact and patterns of ideas, between reality and theory, how things are and how we perceive them to be. This is separate from, and should not to be confused with, the creation of the operational frame, which is covered in the next section. Both the problematization and the operational frame are refined by each other, so the order of their construction is not an impediment to progress.

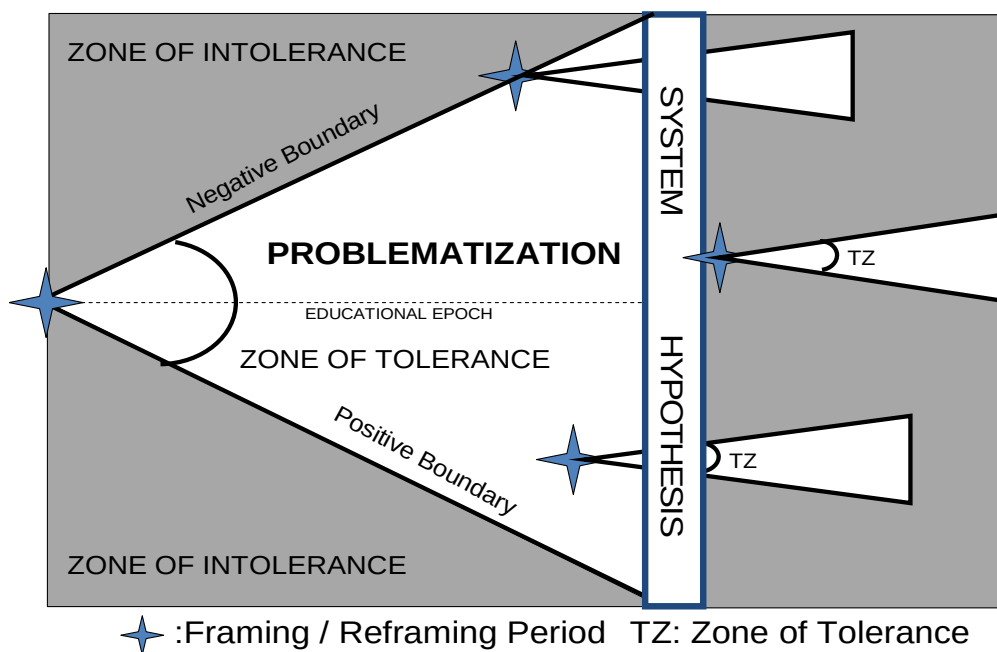


Figure 5. An illustration of problematization as communicated through the concept of tolerance. This includes our systemic understanding bounded by our values and desires in

⁴⁶ The Stoic philosopher Epictetus, as embraced by Cognitive Behavioral Therapy.

relation to the environment. The logic of this theory is expressed in the hypothesis. When new information either exceeds a tolerance or violates the hypothesis then reframing is required and the process repeats itself.

In figure 5, the problematization is bonded through the concept of tolerance across an educational epoch. This conception begins with framing and is extant, through learning, until it requires reframing; when new understanding changes the tolerance boundaries or violates the hypothesis. Three reframing moments are depicted. A new frame is then constructed as the process repeats itself. This diagram is purely theoretical and has no geographical significance. That which can be tolerated goes inside the triangle as the ‘zone of tolerance’, that which is intolerable remains outside. These boundaries can be described in both positive or negative forms and can represent ontological assemblages and direction from a sponsor. There can be multiple boundaries listed on a single line. The conceptual understanding is unified through the creation of the hypothesis; the logic of this creation, the system of tension. The concept and hypothesis are built upon and communicated as the problematization narrative. A contingent relationship of perspective exists between the problem and the solution or the hypothesis; the two are symbiotically connected. This relationship is illustrated in figure 6. It is worth noting that often, we do not develop fully independent ‘solutions’, but rather simplifications or abstractions of the problem we are trying to define. Jane Drake discovered, when interviewing architects, that it was possible to latch onto a relatively simple idea early on in the design process. This simple idea, or ‘generator’ is “used to narrow down the range of possible solutions, and the designer is then able to construct and analyze a scheme. Here we see this very close, perhaps inseparable, relation between analysis and synthesis.”⁴⁷

⁴⁷ Jane Drake’s concept of the primary generator and the design process quoted in Bryan Lawson, *How Designers Think; The design process demystified*, (Oxford: Architectural Press, 2006), 46.

The Dialectic of Problem Creation and Solution Development as Problematization

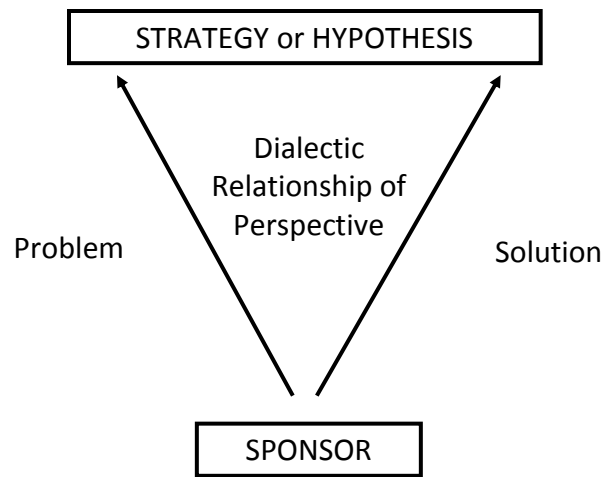


Figure 6. The relationship between the solution and the problem as contingent on each other. Both are constructed from the perspective of the sponsor and his reframed view of the world.

The Operational Frame.

The construction of the operational frame is the expression of strategic choice (steps 5 & 7 in figure 3). Focused by the problematization, the operational frame is the consequence of the theory or solution (step 5) as a change in paradigm, combined with the functions of transformation and reinforcement (step 7 in figure 3) that have been identified. These functions are purposefully not listed as positive and negative tensions. A neutral or positive tension may exist as a form, but the proposed solution may wish to harness these functions in a novel direction. The logic of this tension would be transformed. This transformation is not, therefore, reserved for altering only negative or undesirable tension within the system frame. The method of analysis and synthesis of these tensions is discussed in the following section on the three rationales.

The operational frame is not a reduction of the system frame: the three most significant parts; but the incorporation of increasing complexity as understanding develops. A critical element of the design approach is the deconstruction and creation of patterns of ideas. The system frame is deconstructed as the functions and logic of various assemblages are synthesized into a new, operational frame, bound by enduring relevance. The frame provides both positive and negative operational constraints on the emerging design. It implies areas for exploitation and explicitly marks areas outside future tolerance. These constraints are grounded in national characteristics and by capabilities. The separation of the final strategy, from the operational frame, is a distinct departure from OTRI's SOD theory.⁴⁸ The purpose was to aide subsequent planning through the creation of an additional strata of reference, to aid reframing at multiple levels: system understanding, operational framing and strategy.

The operational frame is not the establishment of quasi end states to be 'achieved by the strategy.' It creates space for action, striated through choice, for smooth exploitation by the design, as a strategy that guides action (step 8 in figure 3). This manifests itself as the 'Space for Intervention' transformed by the forms of the strategy. A sponsor may also directly impose operational framing requirements. At every effort these requirements should be subsumed within the systemic understanding, otherwise an eccentric strategy will be produced. This solution will be incompatible, or sub-optimal, with the environment for which it was designed.

⁴⁸ As explained by Brig Gen Naveh, OTRI's theory emphasizes the creation of two frames: the System Frame and the Operational Frame as the cognitive steps of design. The emphasis on the Operational Frame, rather than the design itself, is to signify the importance of setting the conditions for action as a function of deconstructing understanding and constructing a frame through the process of the three rationales, the Rival as a Rationale, Command as a Rationale and Logistics as a Rationale. This allows the operational frame to direct the creation of an *organization* and a *plan* specific to the unique situation encountered. The system of systems is a dialectic between the two frames : an ontology of emergence, the systems frame and the emerging ontology of transformation, the operational frame. The tension between the two provides the point of reference to reframe from following the execution of the design. The emerging ontology of transformation is at once the organization, the problematization and the plan, it creates the space for intervention expressed in the logic of the strategic raid.

The Three Rationales as a Method of Analysis and Synthesis.

The three rationale discourses anticipate the need for transformation and require the analysis and synthesis of assemblages. This deconstruction of the form, function and logic of a system follows according to the focused lines of enquiry of the *Rival as a Rationale*, *Command as a Rationale* and *Logistics as a Rationale*.⁴⁹ These provide the logic of problematization and enable design to offer a comprehensive problem type classification and framing tool encompassing the rival to our intents, command as a function and the sustainment of potentials, including our own. The rationales contribute to the transition from logic and theory to strategy and action. It creates room for evolutionary understanding; of our direction from higher command, the rival entities of the situation including physical, adversarial and conceptual (our own attitudes) and how the strategy will be sustained. This approach is uniquely suited to when we come to build the organization that will employ our strategy. Tensions will emerge between the existing structure and the potential required by the design e.g. from command centric, hierarchical to user/provider lead, or a swarm mentality. The design approach contributes to imaginative and novel task organization that enables an institution to see operations as a means of learning about the environment. These rationales further facilitate the transposing of strategy within tactics, the fusion of strategic perception and tactical appreciation. They provide a common thread through the development of frames that enable comparisons allowing reframing of the various forms, function and logic of the rival at different levels of understanding.

⁴⁹ *Rival as a Rationale*: Arriving at the identification and understanding of the key rival system (s) through a logical discussion of its streams, tensions, potentials, and operating logic. (*Rival*: Any system operating in direct or indirect contravention to the desired aims of the friendly system). *Command as a Rationale*: Arriving at the identification of the most effective command structure through a logical deconstruction of the form, function and logic of the streams, tensions, potentials, and operating logic of the rival system, friendly system, and the system framework. Used in the deconstruction of the systemic frame to construct the operational frame and in the building of the organization that employs the design. *Logistics as a Rationale*: Arriving at an understanding of the potential energy within the system through a logical discussion of the streams, tensions, potential, and operating logic. The result of logistics as rational bounds the operation framework.

The Strategy.

The strategy, is the output of this process; however, the product is the understanding and iterative nature of the process itself. A strategy communicates guidance as a foundation to enable planning and is the narrative of how we see ourselves as a force of *intervention*.⁵⁰ The strategy (step 8), is not the solution (step 5), but the consequence of *how* the solution will be employed through the various forms of intervention. The OTRI model emphasizes the cognitive importance of a well structured frame as the foundation for planning, the operational frame, not the strategy, is the lowest significant level. The variation on this theme, expressed in the SAMS DP, adds a level to increase the number of discourse between the hierarchies of command as an aid to the filtering process of: understand, problematize and frame. It offers three rather than two frames of reference to give planners increased guidance as vistas into the designers mind.

Figure 7, illustrates a strategy, the form of which reflects the systemic process which framed it, the operational concepts have not been deconstructed into lines of operation. Nevertheless, it indicates where effort should be applied and how the theory is going to be employed.⁵¹ This translates the integrated approach of problem framing to designing strategy, enabling the segregated of processes in a subsequent plan of action. The strategy now becomes the translation of theory and concept into planning guidance. Designers are required to think, empathetically, several levels below their own in order to validate their strategy.

⁵⁰ *Intervention*: Any action taken to create a new potential(s), or retard progress of the system toward an undesired potential(s). All interventions are designed to learn more about the system.

⁵¹ Created with Majors John Nalls and Christopher Roberston of the U. S. Army.

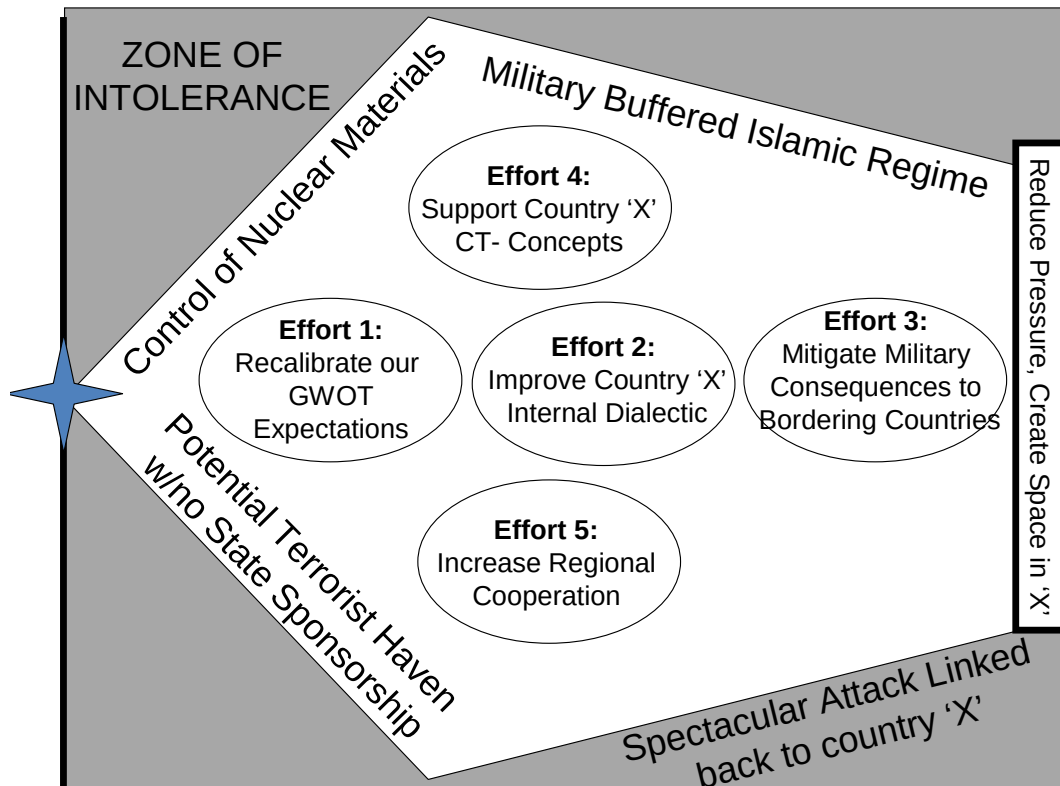


Figure 7. An illustration of a strategy. This clearly shows the systemic links with the problematization and expresses as efforts the guidance required for transformation: of both our values and the environment. The logic of these forms of intervention is included in the unifying hypothesis. This is still an integrated concept and has yet to be segregated into lines of operation that will be communicated in plan and are required for action.

As further guidance to planners of this strategy, each effort was given a unifying purpose which was further subdivided into actions that nested with the effort purpose. These actions were communicated to the planners with four necessary functions: an indicator, a sensor, a learning mechanism (measurement if learning MOL) and a measurement of understanding (MOU). This enabled the action to feed back into the design to enable reframing.

FUNCTION

*“On every occasion that I have been sent to achieve some military objective in order to serve a political purpose, I, and those with me, have had to change our method and reorganize in order to succeed. Until this was done we could not use our force effectively. . . Only when adaptation and context are complete can force be applied with utility.”*⁵²

General Sir Rupert Smith.

Distinguishing between the World, the Mind and the World within the Mind.

Before force can be applied and design can begin, thinking needs to occur. This necessity contributes to the thoughtless fashion in which this grounding activity is often conducted, when thinking is more a reflex than a deliberate act. It is imperative to first distinguish between categories that exist in our mind as epistemological constructs and those that inhabit the world as ontological relationships. Without this distinction we will impose upon the world, through our design, an order and hierarchy that is a mental fabrication, an illusion, resulting from inaccurate observation, misunderstanding and poor communication. A distinction between the categories of substance and attributes, between *intensive* and *extensive* qualities, will enable an intrinsic understanding of difference, which lies at the heart of Deleuze’s philosophy.⁵³

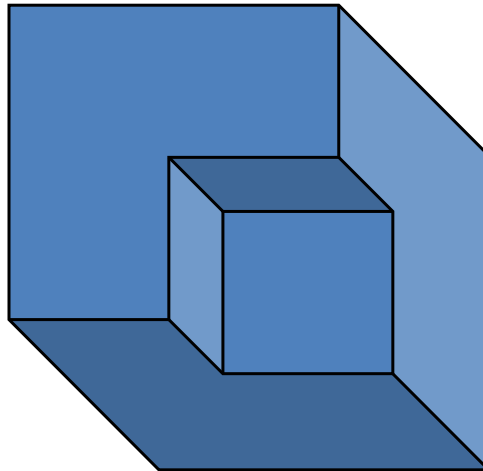
Designs and strategies are ephemeral in nature, and so should evolve as an identity of ‘becoming’, however, this process must be one of clear sighted thought, divest of cognitive illusions. The term cognitive illusions is used here to indicate mental biases that actors may be unaware of, and if germane to their existence, ignorant to the degree to which they alter their

⁵² Rupert Smith, *The Utility of Force, The Art of War in the modern World*, Allen Lane, London, 2005, x.

⁵³ *Intensive qualities*: The internal properties of a system with regard to its immanent relations (density, boiling point of water). In contrast to extensive properties that are defined by an external measure or standard (length, volume). Extensive properties are divisible without a qualitative change in the underlying system. An assemblage is the relationship between intensive, internal properties, and changes to these multiplicities results in qualitative change. Deleuze’s ontology claims that intensive morphogenetic processes give rise to actual or stratified entities whose extensive and fixed properties are the object of representation, and occlude the intensities which gave rise to them. In contrast to *Extensive qualities*.

understanding, interpretation or representation of the world.⁵⁴ The key concept is the difference between representation and presentation. The former is our ‘view’ of the world, a mimic or copy that is more illustrative of our values and our perspectives than the object of our observation, that which is present as the world. The change in our understanding, following the revelation of these biases, results as an internal transformation in how observations are processed, not from a change in that which is observed. In this sense, they are akin to mental illusions analogous to optical illusions. The change in perception of an optical illusion is a change in the mental construct of the observer, the image remains constant throughout. Nevertheless, the new perspective will confer a new form and subsequent logic to the observed object. This is illustrated in figure 8.

How the mental projection of our values alters our perception of concrete objects.



A box within a room or a corner removed from a cube?

Figure 8. The use of an optical illusion is intended to express the metaphor of the limiting function of mental constructs as impediments to observing the world. These are necessary constructs but should not be applied without reflection of the biases they contain.

⁵⁴ For a more thorough examination into cognitive bias see Massimo Piattelli-Palmarini, *Inevitable Illusions*, (New York, NY:John Wiley & Sons, Inc.), 1994, from where I have adopted the term ‘cognitive illusions’.

This process of self examination and investigation is one step removed from the practice of design. It represents the distinction between doing design and thinking about how design ought to be practiced. The questioning of what we know, why and how we employ this knowledge is the process of meta-questioning. This analysis of method is a second-order discipline that relies heavily on the interdisciplinary skills of educational theory and the philosophy of science. Both of these contribute to our ability to evaluate the procedures and structures of the various sciences and methods of learning that we routinely employ.⁵⁵

Epistemology as the Distinction between Presentation and Representation.

Epistemology, or the ‘theory of knowledge’ is the wide-ranging, loosely knit collection of philosophical problems concerning such notions as knowing, perceiving, proving, inferring, establishing, reflecting and so on. It concerns itself with why we assent to mathematical propositions as conclusive proofs or theorems given the absence of demonstrable certainty.⁵⁶ This philosophical discipline helps establish the difference between our cognitive inadequacies, our confusion between what we experience and our representation following concrete experience (empiricism).⁵⁷

Of critical importance is the designers’ ability to distinguish between observations that mark an epistemological inference and those that reflect an ontological reality. Otherwise, design will progress within the representation of reality rather than its presentation and proceed from a flawed premise that resides in a different plain from our actions. The difference is analogous to the distinction between sign and symbol. One is not more real than the other, and both exist, but one is actual while the symbolic is representative of a fact or value. Here, epistemological is contrasted to ontological. That which is epistemological exists as a mental category while

⁵⁵ John Losee, *Philosophy of Science*, (Oxford: Oxford University Press, 2001), 2.

⁵⁶ Jonathon Ree and Urmson ed. *The Concise Encyclopedia of Western Philosophy*, (London: Routledge, 2005), 113.

⁵⁷ *Empirical*: An argument that follows from experience, inductive. A conclusion that is contingent on conditions (empirical) and therefore not necessary.

ontological is a corporeal entity existing in the world. This is not to be confused with a subjective-objective differentiation. The epistemological construct of ‘amphibian’ is equally accessible to everyone familiar with the categorization of the animal kingdom. Such knowledge is not unique to personal understanding, although the term reaches fruition in the mind of an individual; it remains universal. The category is symbolic of certain qualities present in a group of animals. However, the category itself does not exist in the real world, it is a creation, a mental construct to aid in our understanding. This makes it epistemological rather than ontological. Figure 9 graphically illustrates this concern in a military context.

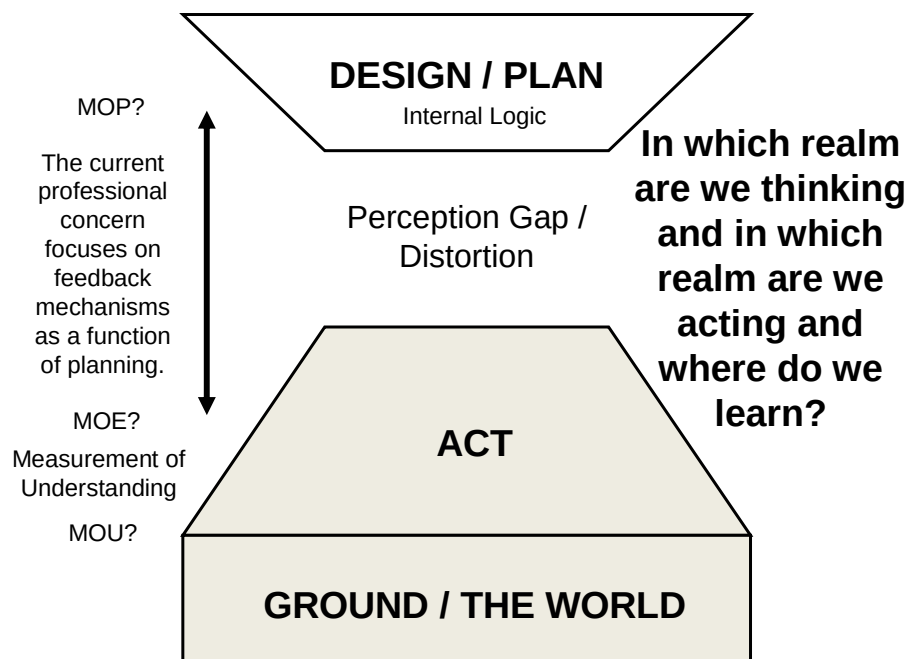


Figure 9. An illustration of the perception gap between presentation as ontological existence and representation as epistemological constructs. The difference between acting from plans that are one step removed from reality or acting in reality as a unified domain.

Conventions, generalized theories that conform to a hypothesis which has been subjected to testing, are distinct from laws in that they lack the contingent necessity of a law and its absolute nature. Nevertheless, they are still useful for an everyday interpretation of the world. The utility of these conventions contributes to our difficulties in being able to step outside them and to critically evaluate what we are observing and trying to describe- they appear symbiotic,

however, this is rarely the case. An example is the nature of chance and probability. While chance is present in the world through random events, it is represented in the mind as the construct of probability, a measurement that is useful and bounds the infinite for our finite understanding. The existence of contingent properties, those constituents that are required but not obligated, optimal but not essential for an event to occur, is in contrast to an understanding that relies upon necessity. Evolution is reliant upon contingent properties, not random chance for mutation and development. The introduction of chance, as a mental illusion, clouds our ability to understand the infinitesimal conditions that are contributing to enable evolution. Instead it introduces a clumsy, fatalism as if ordained by necessity, all of which are a mental aberration and alien to the process as it exists in the world, rather than our representation of this process. The design approach, through the explicit ability to question our values and how we approach a problem, our frame, make it a suitable tool to interpret and build the foundation for a systemic approach to problematization. Being able to identify the different nature of statements between these two positions is critical to the process of asking questions and conducting design. It is the first stage in the disjunction of mental categories that block our understanding of the world and the creation of new categories, assemblages that lead to systemic understanding and action remaining on a single plain.

Defining Ontology as the distinction between Categories and Predicates.

Ontology rests upon determining the nature of something which can be known through its *categories and predicates*.⁵⁸ Introduced by Aristotle, the term category is defined as anything that

⁵⁸ *Categories*: Something that exists on its own, an ultimate class, the highest genera of entities in the world. Aristotle defines it as, 'that which is neither predicted of a subject nor in a subject'. An attribute that can belong to entities of one category cannot be entities in any other category. In the philosophy of Deleuze, assemblages are systems that are constructed through the smooth relationship of exteriority. This process creates 'new systems' that cross traditional categorical boundaries. In a pejorative manner, categories are contrasted to assemblages as representing ontological relationships rather than epistemological ones. See *essence*. *Predicates*: From formal logic, the science of correct reasoning. That which is predicated of the subject of a

could be asserted truly or falsely of anything. These are further compartmentalized into predicates, being a sub-strata that belongs to but is not exclusive of the category that it refers to. Contemporarily, it is used in an ad hoc fashion without a settled convention to mean an ultimate type, and therefore, remains vague apart from its hierarchical relation to its consequential predicates.⁵⁹ In this respect, in philosophy, a category has a distinct meaning that is substantive. Here *substance* is equivalent to a ‘thing’ or ‘individual’ (as opposed to its properties or relation), or reality (as opposed to its appearance).⁶⁰ The search for ontology is a further quest for differences; between properties of extension and intensive properties. This is not an infinite search, philosophy is aided by the companion of common sense and guidance which bounds investigation through the quality of relevance. This is not defined by the categorical value of the object, but its suitability for employment in the designer’s assemblage; however they see fit, rather than the heteronymous categorical value that objects inherit in a given paradigm.

Science and data collection are concerned with extensive properties: dimensions, volume and factor analysis. These are properties that change as the subject is dissected, through examination and disjuncture. Philosophy and design are concerned with the intensive qualities that remain distributed within an object: density, essence, logic. These are the properties that are collected to form the new assemblages. In the philosophy of Deleuze, these intensive properties

proposition; the second term of a proposition is predicated of the first term by means of the copula- “Socrates is a man, predicates the manhood of Socrates”. In this respect, the predicate is that which is determined by an early condition. For Deleuze the separation of predicates from categories is part of his philosophy of difference and the separation of presentation (the subject) from the representation (the proposition that is affirmed or denied about the subject). The consequence, or second order of an ontology, the relating or underlying condition. Relating to the rule of language; from Chomsky’s theory of transformational grammar- with deep structure and surface structure. In logic, the distinction between *categories* and *predicates*.

⁵⁹ Jonathon Ree and Urmson ed. *The Concise Encyclopedia of Western Philosophy*, (London: Routledge, 2005), 72.

⁶⁰ Ibid., 373. *Substance*: Equivalent to ‘thing’ or ‘individual’ (as opposed to properties or relations), or reality (as opposed to appearance). Originates from Aristotle’s notion of ‘nature’, ‘essence’ or ‘being’. In Deleuze the lines of exteriority that forms the beginning of a process of stratification. In contrast to *predicate*. See *category*.

are referred to in 'lines of exteriority'. Links across categorical domains that constitute assemblages. These assemblages exist as ontological realities that we experience metaphysically. It makes sense to refer to these as 'emerged systems' as opposed to the categorical striated hierarchy that is an academic, epistemological construct.

A Paradigm Shift: Transcendental Experience and Knowledge.

Once familiar with the ontology of our experience, it becomes necessary to distinguish between those that exist epistemologically, in our minds, and those that have metaphysical qualities; and exist in the world. This contrast is distinct to the relationship between categories, and not to be mistaken for a subjective-objective differentiation. Nor, is it to be mistaken for the distinction between what we know through empiricism and the light of *positive* exploration and metaphysical deduction.⁶¹ We are concerned here with the Kantian notion of transcendental conditions that make knowledge possible. Kant regarded sense experience and its interpretation reliant on *a priori* knowledge.⁶² This knowledge is required in order for us to process and interpret our sense experience; knowledge precedes experience. Hume distinguished between what he called 'matters of fact' and 'patterns of ideas'. In this interpretation, matters of fact are synthetic and *a posteriori*; they require experience to validate and ground them, while patterns of ideas are *analytic*, they exist independent of experience and more importantly are, therefore, *a priori*).⁶³

⁶¹ *Positivism*: The school of philosophy that claims that the only authentic knowledge is that which is based on actual sense experience (*empirical*). A rejection of metaphysical philosophy as intellectual pretension as it can not be scientifically tested; it can not be 'proven'. Relates to natural law as the revelation of the hard sciences.

⁶² *a priori*: From Latin, 'what comes before.' An *a priori* argument proceeds from causes to effects or from ground to consequent. A judgment or fact that is independent of all experience and impression of the senses for understanding its terms. Relates to arguments, propositions and ideas. An *a priori* argument is one in which the conclusion follows deductively from the premises; a mathematical proof (*analytic*).

⁶³ *Analytic*: From Kant, a proposition which following negation results in logical absurdity. Truth is clear from an analysis of the terms. All analytic propositions are *a priori*. *A Posteriori*: An *a posteriori* argument is one that moves from observed effects to unknown

Deleuze rejects the Kantian interpretation of knowledge as *a priori* to experience, where the latter is contingent on the former for interpretation. Deleuze is battling against the structuralism of categories and holds that such conditions are epistemological in nature and not metaphysical. They are mental constructs, illusions, which rather than help us to understand and interpret our experience, present cognitive barriers to reality. They are ‘representation’ rather than ‘presentation’. Deleuze proposes the creation of new assemblages that cross the striated space of categorical systems and instead present the smooth metaphysical reality of what we experience ontologically. This is in contrast to how we have intellectually ordered things, hitherto, in abstract categories. This proposition is a violent one, where experience shatters our mental categories and replaces them with a radically new world of becoming as a presentation of our experience.

The catalyst for this realization is the crisis that Thomas Kuhn refers to in his radical science. This mental transformation is analogous to a gestalt switch, which is an optical illusion. It occurs in the mind and then leads to fundamental challenge of knowledge and beliefs. Such challenges constitute a paradigm shift; the change in basic assumptions of the ruling theory of science. In contrast to hard science, Thomas Kuhn postulated that the students of humanities have constantly before them a number of competing and incommensurable solutions to problems, solutions that the student must ultimately examine himself.⁶⁴

causes. An empirical observation that can be validated through experience, fire is hot, but not explained; inductive

⁶⁴ Thomas Kuhn, *The Structure of Scientific Revolution*, (Chicago: University of Chicago Press, 1996).

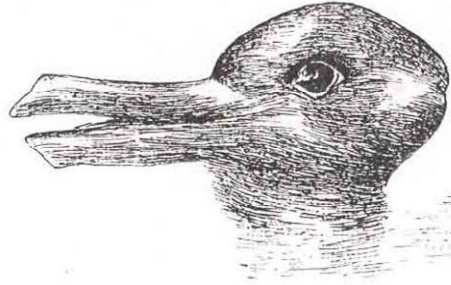


Figure 10. A Gestalt Switch: The Duck Rabbit? A demonstration of the way in which a paradigm shift causes one to see the same information in an entirely different way.

For Kuhn a paradigm change was not simply a rejection of the scientific approach, but represented a challenge to the entire world view; in our profession, the doctrine of problem solving. Grossly oversimplified, a paradigm is a model, a set of rules, or a pattern of behavior that defines current, accepted thinking about a domain. Kuhn noted that paradigms change over time. In most cases this change is evolutionary, rather than revolutionary. However, paradigm shifts can occur and are often dramatic in their consequence. Such an understanding must accept the implications, including transformational ones that accompany such a shift. Specifically this is captured in the format of framing problems, the construct of a design and the subsequent strategy that directs the campaign. This is profoundly more radical than changing ones perspective of how we view a problem. It embraces the disjunction of our world view, a dismantling of the everyday usefulness of how we communicate and interpret the world of phenomena. In this respect design may be more than simply making explicit what is implicit.

Deconstructing Categories, Creating Assemblages and Boyd.

Deconstruction in the philosophical sense refers to a way of reading a text 'against itself'. In simple terms, 'deconstruction' means looking for contradictions, gaps, elisions, revealing metaphors, this process is best considered as a project of 'free indirect discourse'.⁶⁵ To construct a problem it is first necessary to deconstruct ones own perspective; both the assumptions,

⁶⁵ John Marks, *Gilles Deleuze; Vitalism and Multiplicity*. (London: Pluto Press, 1998), 24.

concepts and percepts of the observer, a subject, and the relation to the observed, as an object. This deconstruction is necessary if we are to gain access to a ‘sort of empirical “reality” which does not lie behind, but rather “between” conventional perceptions.’⁶⁶ This is the type of destruction that Col John Boyd emphasizes.

This process, explicit in Deleuze, is also found in Boyd’s, *Destruction and Creation*.⁶⁷ Boyd introduced his paper on destruction and creation by observing that in order to ‘comprehend and cope with our environment we develop mental patterns or concepts of meaning’.⁶⁸ Boyd proposed that new ideas offering breakthrough solutions to challenging problems resulted from mentally deconstructing known concepts and processes, then selectively reassembling key elements to form new concepts- thus characterized as “destruction and creation”.⁶⁹ He noted the importance of choice and relevance, it is this act that forms the new assemblages, as opposed to representing previously acknowledged information in new forms, but with no significant advance. This mental process is affirmed with actions that are taken over and over, decisions rendered to monitor the nature of these actions; an iterative process of observation, framing, reframing and learning. Importantly, it is not the repetition that adds validity to this process, rather the variety of different stimuli that structure our learning. In this context, as expressed in the design approach, successful methods should be guarded against becoming endemic templates for future designs. Boyd concludes that these mental concepts observe reality. Nevertheless, our perceptions and ability to change these concepts should adapt as reality changes.

Boyd uses concepts here as Thomas Kuhn used paradigms. Although more evolutionary, than the crisis that Kuhn refers to, but Boyd agrees with Deleuze, that our mental concepts must

⁶⁶ John Marks, 1998, 26.

⁶⁷ Col. John R. Boyd presented these methods as ‘destruction’ and ‘creation’ in what is referred to as ‘Boyd’s Theory of Destruction and Creation.’ John R. Boyd, “*Destruction and Creation*” (unpublished thesis, September 3, 1976), <http://www.goalsys.com/books/papers.htm> (accessed March 21, 2008).

⁶⁸ Boyd, 1.

⁶⁹ H. William Dettmer, *Destruction and Creation: Analysis and Sythesis*, <http://www.goalsys.com> (accesses April 17, 2008).

continually change. Both propose a deconstructive approach, “we start from a comprehensive whole and break it down; start with particulars and build towards a comprehensive whole.”⁷⁰ This deconstruction applies not just to the subjects of our observation but to our mental categories themselves. Boyd introduces the philosophical concepts of deduction and induction, “deduction is analysis and differentiation, the general to the specific, induction is synthesis and integration; the specific to the general.”⁷¹ Boyd creates his new concepts from the disassembled parts, “a number of domains and parts correspond to each other.”⁷² He is aware of the potential for chaos, and observes, “these mental domains swim in a sea of anarchy.”⁷³ Boyd emphasizes the purpose of the destruction of categories, “an unstructuring or destruction of these domains, to break the correspondence of each other. .. unstructuring as a destructive deduction.”⁷⁴ In Boyd’s Observation, Orientation, Decision and Action (OODA) Loop, illustrated as figure 11, the destruction and creation pattern occurs within the Orientation phases of his adaptation to complexity. The production of new mental images is synonymous with Deleuze’s assemblages.

During the restructuring of these parts, Boyd strikes a similar cord as Deleuze, “how do we reconstruct order and meaning from this chaos? A new domain or concept can be formed from common qualities, attributes or operations.”⁷⁵ This is similar to the intensive properties and the lines of exteriority that Deleuze uses to create his assemblages. “Through connecting the threads (that produce meaning) we synthesize constituents from these shattered domains. Such a synthesis generates something new, different from what previously existed. Creative or constructive induction.”⁷⁶ Boyd again emphasizes the “crucial step is the separation of the

⁷⁰ John R. Boyd, “Destruction and Creation” (unpublished thesis, September 3, 1976), <http://www.goalsys.com/books/papers.htm> (accessed March 21, 2008), 2.

⁷¹ Ibid., 2.

⁷² Ibid., 2.

⁷³ Ibid., 2.

⁷⁴ Ibid., 2.

⁷⁵ Ibid., 2.

⁷⁶ Ibid., 3

particulars from their previous domains.”⁷⁷ He concludes that this is “a way of changing our perception of reality. . . the reversibility of the internal logic, the idea matches reality to remain valid.”⁷⁸

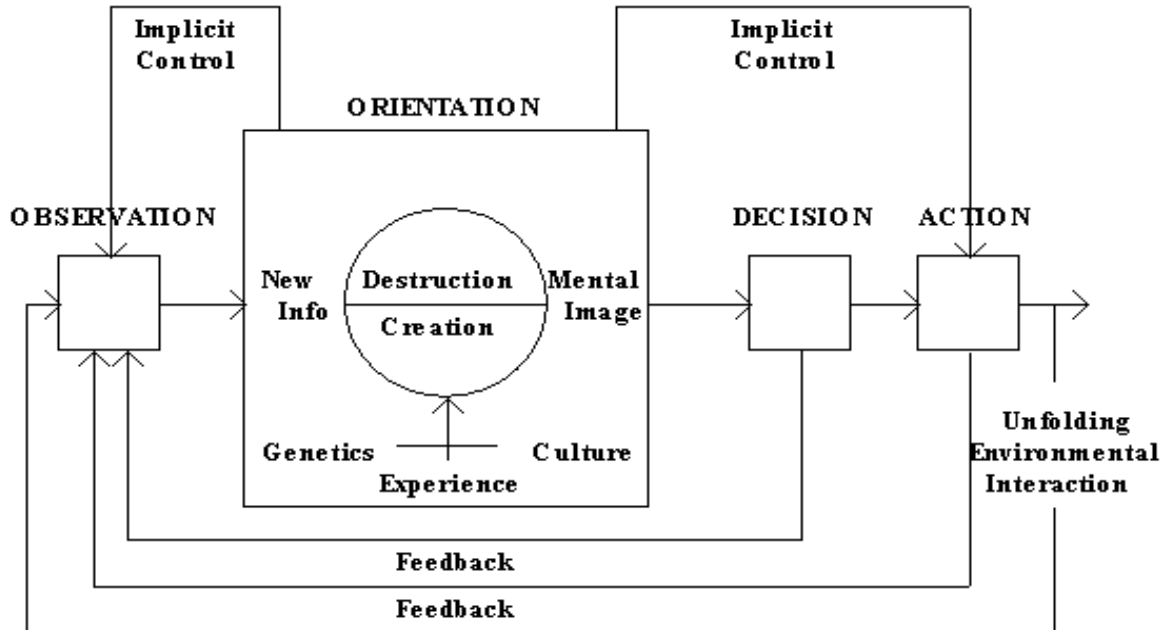


Figure 11. The complete Boyd OODA Loop. The Orientation part, the experience of destruction and creation, is the production of assemblages as new mental images. This is a simpler expression of the Deleuzian concept of identifying processes as we experience them, rather than maintaining a categorization according to the ordering of information. This is achieved through a process of analysis and synthesis which requires imagination, vitality and energy. It is not the reordering of the same information, but a creative act: the creation of snowmobiles.

Deleuze’s empiricism is at the heart of his ontology and assumes that everything exists only as ‘multiplicities’. Everything is constructed as a series of elements; ‘lines’ or ‘dimensions’ which are ‘irreducible to one another’. This principle of *heterogeneity* is the idea that relations are external to their terms.⁷⁹ This transcendental version of empiricism is directly opposed to the systematization of subject and object. Rather than a distinction between ‘raw’ experience and the

⁷⁷ Ibid., 3.

⁷⁸ Ibid., 3.

⁷⁹ *Heterogeneity*: Natural order within multiplicities and rhizomes: jumbled-together, mixed-and-matched. Rhizomatic assemblages connect heterogeneous elements but leave them that way so that each retains relative independence and can be plugged simultaneously into other rhizomes. See *assemblage*.

mind that represents and interprets, empiricism is a sort of ‘absolute consciousness’. This transcendence is a plane of immanence that is populated by ‘events’.⁸⁰

Deleuze offers us some creative tools for thinking; meta-thinking, “We are wrong to believe in facts; there are only signs. We are wrong to believe in truth; there are only interpretations.”⁸¹ This relates to his interpretation of empiricism and external nature of terms. The sign is an expression of the way in which order has been *created* rather than discovered. Rather than being linked to language, as Bertrand Russell suggests, signs are linked to thought.⁸² Deleuze is explicit in his attempt to free us from categories which should be regarded as universal concepts of the mind. He wishes to replace them with ontological assemblages, the collection of reality as it relates to each other in the world. Despite their grounding in the metaphysical as opposed to the epistemological realm, these assemblages are still constructs formed by the perspective of investigation and the observed connections. In this sense they are mental images, but a mental act of presentation not representation. Categories as images represent part of our bias that is implicit in our interaction with the world. Part of this bias is the dominant ‘image of thought’, a historical image that stops people from thinking. Deleuze refers to the study of images of thought as ‘noology’ and one that he confronts in *A Thousand Plateaus* with the image of the tree with the rhizome.

The Tree and The Rhizome.

Deleuze’s view of the world considers the segmentation of organisms; their disjuncture and their reconnection. He rejects the western duality of subject-object and replaces it with the notion of smooth and striated space but concert with, not in opposition to, each other, “There are

⁸⁰ John Marks, *Gilles Deleuze; Vitalism and Multiplicity*. (London: Pluto Press, 1998), 34-35.

⁸¹ Gilles Deleuze, *Proust and Signs*, 90, in J Marks, *Ibid.*, 37.

⁸² John Marks, *Gilles Deleuze; Vitalism and Multiplicity*. (London: Pluto Press, 1998), 37.

lines of articulation or segmentarity, strata and territories; but also lines of flight, movements of deterritorialization and destratification.”⁸³ These lines constitute an assemblage.

Deleuze explores these intensive properties through their external connection, their logic, rather than their form, “a book exists only through the outside and on the outside.”⁸⁴ Deleuze contrast two different systems: the root and the rhizome. The rhizome is a concept that is borrowed from biology opposed to the principle of foundation and origin which is embodied in the tree. It is used as a vehicle to deconstruct the received structure of understanding. The model of the tree is hierarchical and centralized, whereas, the rhizome is proliferating and serial, functioning by means of the principles of connection and heterogeneity. Extending the analogy of a book, a root-book follows the law of reflection and “imitates the world, as art imitates nature.”⁸⁵ It follows a binary logic that struggles to reach an understanding of multiplicity. This is contrasted to the radicle-system or fascicular root; the rhizome. This embracing of multiplicity becomes a “radicle-chaosmos all the more total for being fragmented . . . a rhizome assumes diverse forms, from ramified surface extensions in all directions to concentration into bulbs and tubers. . . . the rhizome includes the best and the worst: potato and couchgrass.”⁸⁶

The rhizome is understood through the connections that form its substance, “principles of connection and heterogeneity: any point of a rhizome can be connected to anything other, and must be. This is very different from the tree or root, which plots a point, fixes an order.”⁸⁷ A rhizome continuously establishes connections between semiotic chains, repeatedly rupturing along segmentation lines and emerging as new assemblages composed of the heterogeneous form along lines of flight. Only when this multiplicity has been embraced and “effectively treated as a

⁸³ Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, (Minneapolis: University of Minnesota Press, 1987), 3.

⁸⁴ *Ibid.*, 4.

⁸⁵ *Ibid.*, 5.

⁸⁶ *Ibid.*, 6.

⁸⁷ *Ibid.*, 7.

substantive, ‘multiplicity’, that it ceases to have any relation to the One as subject or object.”⁸⁸

An assemblage is precisely this increase in the dimensions of multiplicity that necessarily changes in nature as it extends its connections. There are no points on a rhizome, such as those found in a structure, tree, or root. “Multiplicities are defined by the outside: by the abstract line, the line of flight or *detrterritorialization* according to which they change in nature and connect with other multiplicities.”^{89 90}

This multiplicity is expressed in the nature ‘of becoming’ the concept that it is never static but fluid and without boundaries but with an unifying logic bound by these connections. “The rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines.”⁹¹ It is necessary to emphasize that Deleuze is not setting up a dialectic between smooth and striated, segmented and static, flowing and dynamic, not on a normative level as good and bad are perceived. “Every rhizome contains lines of segmentarity according to which is stratified, territorialized, organized, signified, attributed, as well as lines of detrterritorialization down which it flees.”⁹² The ability to restratify everything gives the rhizome the organizational quality of emerging along new planes following a rupture, the attribute of reconstitution of the subject.

In simple terms, any line can be connected to any other line. However, these lines do not connect to form an organic whole; it is a step in creating a new image of thought. The rhizome is multiplicity, and as such seeks to move away from the binary subject-object structure of Western thought. There are no single points or positions within a rhizome, only a mobile bifurcation of a

⁸⁸ Ibid., 8.

⁸⁹ Ibid., 9.

⁹⁰ *Deterritorialize* in relation to breaking from a territory. Prior to *Reterritorialization*, part of forming a new assemblage, an emergence of becoming: The process of forming new territory, never to return to an old territory. Used by Deleuze to depict the becoming of multiplicities.

⁹¹ Gilles Deleuze and Felix Guattari, *A Thousand Plateaus*, (Minneapolis: University of Minnesota Press, 1987), 9.

⁹² Ibid., 9.

series of lines. It is neither mimetic nor organic, it only ever maps the real, but this sort of mapping is a method of experimenting with the real: an open system with multiple exits and entrances.⁹³ It is smooth and evolving, a hypothesis to be reframed. A rhizome is analogous to a plateau, a block of intensity which is not organized around a point of culmination. In this way, the plateau again challenges the “regrettable characteristic of the Western mind to relate expressions and actions to exterior or transcendent ends, instead evaluating them on a plane of consistency on the basis of their intrinsic value.”⁹⁴ It replaces a teleological perspective with a potential of the system perspective and begins the crack in the determinist, linear view of the Jominian approach to strategic planning.⁹⁵ This concept is part of the larger dialectic between organization and hierarchy, possibility and becoming; between the striated and the smooth.

Assemblages as Distinct from Categories.

The distinction between the organism and the mechanism is redundant: both are machines. *A Thousand Plateaus* calls into question all conventional forms of ordering the world into categories such as organic, non-organic, linguistic, technological etc. It offers continual possibilities for the mechanic assemblages that all are plugged into one another.⁹⁶ Thought is seen as an ‘event’, an empiricism that depends upon a systematic dismantling of identity. This reaches fruition in new assemblages in the notion of becoming. A prime example is the wasp-orchid. The orchid becomes necessary to the life of the wasp and vice-versa: what is primary is the new assemblage, the wasp-orchid machine. . . it does not have a subject separate from itself. This new assemblage, the symbiosis, is marked by emergent properties above and beyond the

⁹³ John Marks, *Gilles Deleuze; Vitalism and Multiplicity*. (London: Pluto Press, 1998), 45.

⁹⁴ Deleuze & Guattari, *A Thousand Plateaus*, (Minneapolis: University of Minnesota Press, 1987), 22.

⁹⁵ See Francois Jullien, *A Treatise on Efficacy; Between Western and Chinese Thinking*, University of Hawai’i Press, Honolulu, 2004, 15-31, 46-84.

⁹⁶ John Marks, John Marks, *Gilles Deleuze; Vitalism and Multiplicity*. (London: Pluto Press, 1998), 49.

sum of the parts.⁹⁷ This process of leaving home and altering habits and learning new tricks is referred to as deterritorialization, how bodies leave a territorial assemblage and ‘reterritorialize’ to form new assemblages.⁹⁸ The significance is not the form of their structural tessellation, rather the logic, the processes that explain their difference from the representation provided by categories. In this respect assemblages increase complexity and provide the philosophy of difference that follows the creation of new patterns of thinking and the establishment of new paradigms. To capture Deleuze’s example I shall quote at length:

The orchid deterritorializes by forming an image, a trace of a wasp; but the wasp reterritorializes on that image. The wasp is nevertheless deterritorialized, becoming a piece in the orchid’s reproductive apparatus. But it reterritorializes the orchid by transporting its pollen. Wasp and orchid, as heterogeneous elements, form a rhizome. It could be said that the orchid imitates the wasp, reproducing its image in a signifying fashion (mimesis, mimicry etc.). But this is only true on the level of the strata – a parallelism between two strata such that a plant organization on one imitates an animal organization on the other. At the same time, something else entirely is going on: not imitation at all but a capture of code, surplus value of code, an increase in valence, as veritable becoming, a becoming-wasp of the orchid and a becoming-orchid of the wasp. Each of these becomings brings about the deterritorialization of one term and the reterritorialization of the other; the two becomings interlink and form relays in a circulation of intensities pushing the deterritorialization ever further. There is neither imitation nor resemblance, only an exploding of two heterogeneous series on the line of flight composed by a common rhizome that can no longer be attributed to or subjugated by anything signifying.⁹⁹

⁹⁷ M Bonta & J Protevi, *Deleuze and Geophilosophy A Guide and Glossary*. (Edinburgh: Edinburgh University Press, 2004), 59.

⁹⁸ *Ibid.*, 78.

⁹⁹ Deleuze, Gilles and Guattari, Felix. *A Thousand Plateaus; Capitalism and Schizophrenia*. (Minneapolis: University of Minnesota Press, 1987), 10.

These assemblages are at once the start point and the conclusion of the systemic understanding that frames our approach to forming the operational frame. They represent the existential challenge of the difference between our expectation and our experience of existence. The ‘motorcycle’, in a metaphysical sense, is not the same as our ‘expectation’ of the motorcycle which is epistemological. When we experience it on a sunny day, driven at reasonable speed on good quality, empty roads, it is different from the cold, wet, dangerous impression we formed from an imagination that had us commuting, pillion, at the end of a long day in heavy city traffic, in the rain.¹⁰⁰ The assemblages’ themselves, are essential but not abstract, metaphysical but not turgid, real and evolving. They are ‘becoming’ containing systemic potential and are not predictive, or absolute end states. They represent the Logic of the systemic understanding as a frame; the construction of an ontology. They are the rhizome of our design. They transcend a System of Systems view of the world, one that is predicated on categories. Nevertheless, they depend upon the striated world of values and events in order for their existence. Their creation is the first inversion of difference, where experience changes knowledge, when striated becomes smooth.

¹⁰⁰ The inspiration for this analogy comes from Robert M. Pirsig, *Zen and The Art of Motorcycle Maintenance; An Inquiry into Values*, Harper Perennial Modern Classics, 2005.

LOGIC

“If one sees only a chaotic jumble of events in war, one should reject strategic art altogether. Strategic thinking begins when one in the course of military operations begins to see a certain path that must be taken in order to achieve the goals of the war”.¹⁰¹

Aleksandr A. Svechin

Form, Function and Logic as a Method of Discerning the Underlying Pattern of Events, Space and Language.

Central to the design approach is the contemplation of identity, the ontology of a subject. In the systemic approach advocated in this monograph, this builds on the philosophy of Deleuze and notion of constructing an ontology of becoming; the emergence of an assemblage that is the presentation of the intensive qualities rather than the representation of the extensive form. This philosophy of difference embraces the architectural distinction of Form, Function and Logic as expresses by Christopher Alexander.¹⁰² Alexander through his exploration of the different patterns: events; space; and language contributes to our understanding of an object, its ontology as an assemblage of these functions. The intensive properties of a place is not the arithmetic of the extensive activities or the form of its structure, rather the assemblage of the episodes which happen there.¹⁰³ These events are not necessarily human events, and may be a combination of events that have a bearing on our lives.¹⁰⁴ Generally, it is not possible to go beyond the bounds of the collection of events of a particular culture- this represents a striated form of understanding.¹⁰⁵ The language of the patterns is codified in the culture of its use. This is analogous to the Deleuzian understanding of categories as striated form that dictates how we interpret the world, one that is obligated by our interpretation, a rendering of events that is contingent to our

¹⁰¹ Aleksandr A. Svechin, *Strategy*, ed. By Kent D. Lee, (Minnesota: East View Publications, 1999), 236.

¹⁰² Christopher Alexander, *The Timeless Way of Building*, (New York,: OUP), 1979.

¹⁰³ *Ibid.*, 62.

¹⁰⁴ *Ibid.*, 64.

¹⁰⁵ *Ibid.*, 69.

education. If the pattern of events cannot be separated from the space where they occur, is it possible to separate the form of thought from the function that produced it? This possibility is what a design approach offers military planners.

The logic on event is the “stream” that describes the physical space and a pattern of events, at the same time.¹⁰⁶ The success in seeing these two as one, is the key to forming assemblages. The skill lies in the separation between form, function and logic, between pattern of space, event and the language that describes them. If such patterns exist to form our understanding, with skill, it is possible to deconstruct our understanding, and reassemble our experience in new images. This *reterritorialization* is the process of forming assemblages.¹⁰⁷ Through understanding the structure of something, not just its form, but also the processes contained within, we are able to grasp it as a whole. The application of general systems theory aides in this heuristic understanding of the environment and will be discussed later in this chapter. The structure of a space supports the patters of events [that occur there in] in such a way, that if we change the structure of the space, we shall be able to predict what kinds of changes in the patterns of events this change will generate.¹⁰⁸ The understanding of potential and propensity contributes to our hypothesis of the ontology and an understanding of the form and function of a place inherent to it, rather than as an imposition of our biases on to it (epistemological projection).

A system approach that enables an understanding of presentation rather than representation, built on the analysis of form, function and logic enables the designers to design strategy with enduring relevance, rather than forming tactical reactions to events, the form of acts that are inconsistent to the underlying pattern of that environment. In this respect, the designer is able to see an emerging path, rather than the chaotic jumble that represents chaos, and is now

¹⁰⁶ Ibid., 73.

¹⁰⁷ *Reterritorialization*: The process of forming new territory, never to return to an old territory. Used by Deleuze to depict the becoming of multiplicities.

¹⁰⁸ Christopher Alexander, *The Timeless Way of Building*, (New York,: OUP, 1979), 83.

capable of designing strategy as Svechin alludes to. Actions are now more relevant to the goals they seek.

Smooth and Striated Thinking: The Separation of Problem Setting from Decision Making.

Throughout the design process dialects have been created as heuristic tools to explain the essential nature of design. These opposites, while figurative in nature, intend to convey the function of the relationship they explain. Design is contrasted with planning, theory with action, smooth with striated and analysis with synthesis. A recognition of these different natures is fundamental to employing design as a distinct function on any level, rather than a precursor to planning. The deconstruction of problems, as striated epistemology is a search for the underlying laws or conventions, the propensities of an environment. This is quiet separate for the unrestrained development of solutions, even simple solutions. The two require separate, but complimentary, strategies: one requires a more scientific approach and is orientated on the problem as an ontology; the other requires an more artistic method focused on the desired result and is predominantly solution focused.

The Use of Dialectics in Design to Understand Ontology as Emerging rather than Constant.

Striated	Smooth
Categories	Assemblages
Form-Function	Function-Logic
Deconstruction	Creation
Analysis	Synthesis
Problem Solving	Solution Formulation
Explicit	Implicit
Relevant	General
Expert Understanding	Shared Understanding
Vertical Command	Horizontal Command
Action	Theory
End States	Propensity
Planning	Design

Figure 12. The dialectic relationship of smooth and striated as it relates to Design. This list includes elements within the design process, learning and military command styles.

In a Deleuzian context these distinctions are captured in the notion of smooth and striated thought. Both present opposite properties that relate to each other. Smooth thought presents intensive essence, it is emergent and nomadic incapable of being defined. Striated is rigid in lines, has form, centers and mass, possesses a hierarchy and definition which confers truth. These contrasts are illustrated in figure 12.

The separation of design from planning and both of these from decision making is explicit in industry, business and amongst creative professions, but it is only alluded to in the military decision making process. The most explicit reference is contained in FM 3-24 the current Counterinsurgency doctrine.¹⁰⁹

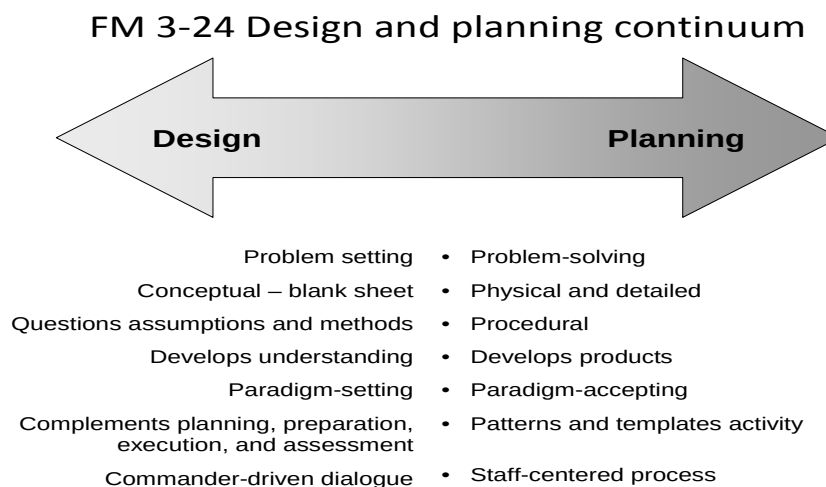


Figure 13. The relationship between design and planning as depicted in FM 3-24 captures similar distinctions to Deleuze’s notion of smooth and striated in a design setting.

This manual explicitly states the “purpose of design is to achieve a greater understanding, a proposed solution based on that understanding, and a means to learn and adapt.”¹¹⁰ The manual emphasizes the difference between design and planning, “design inquires into the nature of a problem to conceive a framework for solving that problem. . . where planning focuses on

¹⁰⁹ Field Manual (FM) 3-24/MCWP 3-33.5, *Counterinsurgency*, 15 December 2006, 4-1 – 4-5.

¹¹⁰ Ibid., 4-1.

generating a plan – a series of executable actions.”¹¹¹ It is included here as the clearest military expression of the role of design and also to corroborate the Deleuzian differences as outline in figure 12. The categorical distinction of design from planning requires a evolution of the military system of planning.

General Systems Theory and the Effects Based Approach.

Systems theory is a rejection of the traditional hierarchical classification of information. In this respect, despite building on analytical tradition as the foundation for problem solving, it proposes a radically different path to decision making. In simple terms, while systems theory embraces analysis, this alone is an incomplete, suboptimal path for understanding and functioning in our world. With out the supplementary step of synthesis our understanding is incomplete.¹¹² The classical Cartesian scientific method progressed under two related assumptions: firstly, that a system can be broken down into its individual components so that each component could be analyzed as an independent entity, and secondly, that the components could be added in a linear fashion to describe the totality of the system.¹¹³ Von Bertalanffy, proposing a systems approach to characterization, rejected this. Instead a system is to be considered as the sum of the interrelation of its parts, including the tensions within the systems, between its components, and rivals to the system as a whole, the external environment.¹¹⁴ The rationale behind his rejection is inherent within the assumption underlying the concept of analysis which is reductionist in nature. The concept that the nature, ontology, of our ultimate experience, can be reduced to indivisible parts and that the analysis of these parts in their own entity, as deconstructed phenomenon, leads to understanding that can be reconstructed to deliver understanding of the more complicated body

¹¹¹ Ibid., 4-2.

¹¹² H. William Dettmer, *Destruction and Creation: Analysis and Synthesis* in <http://www.goalsys.com> (accessed on 17 April, 2008).

¹¹³ David S Walonick, *General Systems Theory*, in <http://www.survey-software-solutions.com/walonick/systems-theory.htm>. (accessed on 15 February, 2008).

¹¹⁴ Von Bertalanffy in S Naveh, *In Pursuit of Military Excellence, The Evolution of Operational Theory*, (London: Frank Cass, 1997), 4-6.

as a whole is expressed in the axiom of analytical geometry: the whole is equal to the sum of its parts.¹¹⁵ An intermediary but necessary step to a systems approach is the introduction of the agent or the observer within the realm of analysis.¹¹⁶ The problem with the compartmental approach provided by analysis alone is that systems have properties they lose when separated from the whole system, and the whole system has essential properties that none of its parts possess. These are captured by systems theory, as expressed in design, in the systemic narrative of the form, function and logic of an assemblage. This includes the essential properties (intensive), the processes a system derives from the interactions of its parts. These are lost during deconstruction, reduction and simplification as a consequence of analysis alone. This pattern of analysis, synthesis and evaluation is illustrated in figure 14.

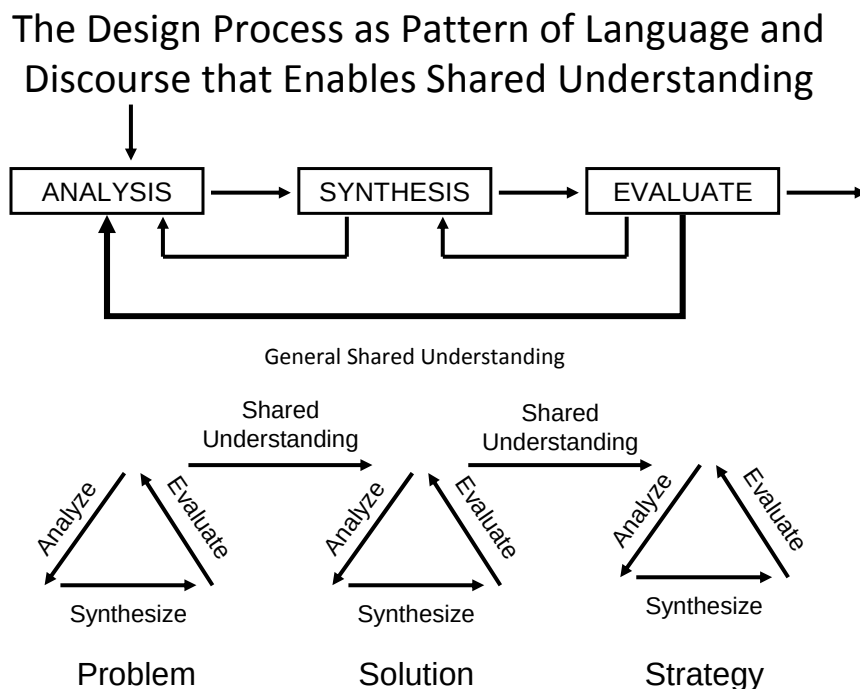


Figure 14. The generic pattern of analysis, synthesis and evaluate as it relates to the design process of problem setting, solution development and strategy formulation.

¹¹⁵ H. William Dettermmer, *Destruction and Creation: Analysis and Synthesis*, <http://www.goalsys.com> (accessed on 17 April, 2008).

¹¹⁶ A foundational concept in Hierarchy Theory. Valerie Ahl & T Allen, *Hierarchy Theory; A Vision, Vocabulary and Epistemology*, (New York, NY: Columbia University Press, 1996).

A systemic approach enables an aggregated knowledge of connected systems avoiding the inadequacy of analysis alone that ignores the central role of interdependencies. The information content of a 'piece of information' is proportional to the amount of information that can be inferred from the information. Knowing one part of a system enables us to infer something about another part.¹¹⁷ This synthesis of understanding includes the reorganization of components in the creation of new systems, the combination of constituents that may never have been considered part of, as either form, function or logic, an alternate system. In our language these are the assemblages. Analysis and synthesis are considered as complimentary processes.

The interrelation of a system should be familiar to those aware of Systems of Systems Approach (SoSA) to the Intelligence Preparation of the Environment (IPE). Systems themselves can be either controlled (cybernetic) or uncontrolled. In controlled systems information is sensed and changes are effected in response to the information. Kuhn refers to this as the detector, selector and effector functions of a system. The military planner may be more familiar with the indicator, sensor and effect or task. Communications within the system involve the exchange of information while transaction involves the exchange of matter-energy. The majority of military actions in a linear solution resolve around a developmental approach that deals with changes in a system over time. There are three general approaches to evaluating subsystems: a holistic or heuristic approach to the system as a complete functioning unit; a reductionist approach which is internal and examines subsystems within the system; and a functionalist approach which looks upwards to place the system within a larger context, as a subsystem of a larger whole. All three are hierarchical exploring the linear relationship within a series of systems.

Through understanding systems theory, a more nuanced application of the effects based operations (EBO) may be achieved as the behavior of the system and our actions within it are

¹¹⁷ A. Kuhn, *The Logic of Social Systems*, 1974, in David S Walonick, , *General Systems Theory*, in <http://www.survey-software-solutions.com/walonick/systems-theory.htm>. (accessed on 15 February, 2008).

placed in context. A controlled system (cybernetic) maintains at least one system variable within a specific range (tolerance). If the variable goes outside the range, the system ‘acts’ to bring the variable back into range. This control is internal to the system. A system where all the forces are balanced to the point that no change is occurring is said to be in a state of *static* equilibrium. Dynamic (steady state) equilibrium exists when the system components are in a state of change, but at least one variable stays within a specified range. An *open system*, in contrast to a closed one, is one that receives input from the environment and/or releases output to the environment. This dynamic equilibrium is what is sought as the systems hypothesis of a complex system (open system). Systems theory employed in a systemic approach provides a framework for classifying and evaluating the world and setting hypotheses that can be tested (acted) and reframed and tested in an iterative process.¹¹⁸ This process, a didactive procedure, becomes the hallmark of the design approach as illustrated in the concept of tolerance as expressed in the problematization in figure 5 on page 21.

Mental Approaches to Complexity, End States and Command in Design.

The difference between complex (open, dynamic and evolving) and complicated (closed, limited and linear) systems inhibits the concept of ‘solutions’ to complex problems. End states are alien to a systemic perspective, there is no fixed, closed state to ‘arrive at’, the system either becomes closed and reaches static equilibrium or evolves to its inherent potential which incorporates inputs to the system.¹¹⁹ If the inputs change the environment then the resulting change becomes part of the system, the rival is subsumed. A complete design should adapt to

¹¹⁸ This whole discussion of the system typology is taken from David S Walonick, , *General Systems Theory*, in <http://www.survey-software-solutions.com/walonick/systems-theory.htm>. (accessed on 15 February 2008).

¹¹⁹ For further explanation of potential as an alternative to end states refer to Francois Jullien, *A Treatise on Efficacy; Between Western and Chinese Thinking*. (Honolulu: University of Hawai’i, 2004).

change as a complete whole. The point that change is no longer tolerable is usually cause for reframing (as illustrated in figure 5 where tolerance is relative to the hypothesis).

The recognition of the complex nature of a problem is the *raison d'être* of design, not planning. The nature of the adapting process as well as the complex environment requires specific command styles inherent to this process. These are based on the Deleuzian notion of smooth and striated thought. Deleuze employs the analogy of the 'war machine' versus the 'state' as his expression of smooth versus striated.¹²⁰ For the purpose of the military designer a recognition of the different styles of command is more tangible; vertical and horizontal are contrasted for this purpose. As illustrated in figure 15, they correlate to striated and smooth. Both are seen to embrace qualities that are more appropriate at different stages of the design process. Neither is represented as good or bad, but sub optimal if used in an inappropriate environment.

The Design Process as it Relates to Style of Command

<u>Meta-Theory</u>	<u>Process</u>	<u>Command Style</u>
• Problem Setting	Striated	Vertical
• Solution Development	Smooth	Horizontal
• Evaluate & Formulate	Striated	Vertical
• Implement	Smooth	Horizontal

Shared Understanding is required to move between the different tasks in the meta-theory and to move between the styles of command. For the Commander, the ability to explicitly recognize which style of command is required during the design process enables discourse without threatening authority. Leadership is required when part of the team lacks a shared understanding or wishes to return to a previous step to explore in more detail.

Figure 15 The correlation of Command Style to the design process.

¹²⁰ Deleuze and Guatarri, *A Thousand Plateaus; Capitalism and Schizophrenia*. Minneapolis: University of Minnesota Press, 1987), 351-423 and 474-500.

Chaos theory is an attempt to explain and model the seemingly random components of a system. It recognizes that seemingly small changes can produce large system corrections. Chaotic systems depend on the nonlinear nature of its components, but can have both stable and unstable components. In these systems order is not absolute, but rather a product of perspective and relative to the observed and the relation of the observer- including the method of observation and interpretation itself. The observer, the designer imposes order, design on the system. The internal area is the hypothesis and is connected to the reframing as the unifying structure of an evolving design. The capstone concept is the recognition of order within chaos, evolution continues and is resolved when it is accepted that some problems cannot be 'solved'. They are reframed as part of the design resulting in order, the hypothesis. Another observer, using alternative parameters, may see less chaos and different patterns, the competing hypotheses are equally suitable or 'true'. The nature or validity of a system is, therefore, a product of perceptions or beliefs. Accepting this perspective has radical implications for the traditional setting of military end states and our understanding of operational termination. Instead of seeking absolute resolution to a system or crisis, we should frame the problem to explore the existing potential of our design.

Fuzzy Logic; Setting the Hypothesis within a System's Potential.

The potential of a system is communicated as the system hypothesis; a hypothesis that is meaningful in its relation with the design. Tolerance is related to the logical potential of an environment coupled with the sponsor's desires and bounds the area for the hypothesis construction. This approach coupled with the notion of probability rejects the traditional and linear dichotomous classes of true and false, and introduces a third alternative: the probable. The notion of probability is framed within the concept of desired tolerance (not right or wrong, positive or negative) illustrated in figure 5 on page 21. Once this addition avenue has been adopted, a myriad of alternative middle values become available when seeking system redirection

in a state of dynamic equilibrium. The conventions of contradiction and incompatibility are no longer system boundaries placing limits to our tolerance and actions within a complex environment. This approach is facilitated through an iterative process of reframing as a consequence of action. The middle terms within our system boundaries are validated through contingent relationships, rather than absolute positions. As a strategy the designer begins to seek tentative answers to fundamental questions, rather than definitive answers to trivial ones.

The nature of chaos, a constant challenge to the structure and purpose of the design, necessitates the requirement for transformation and reframing. For a system to have a structure it must have limits or boundaries. A notion of boundaries incorporates themes of identity in accordance with the theory of contradiction: if something is A it is not B. In a systemic approach the boundaries of the system are not defined by the set of interacting components: the whole of the system, its state, form or identity is not the sum of its parts. As Kuhn recognizes, it is the investigator, not nature, that bounds the particular system being investigated.¹²¹ This act is clearly acknowledged in the inclusion of the sponsor's desire in system framing and in the expression of choice that defines the operational frame; explicitly, the designers construct a frame in relevance to these desires. In design the systems boundaries become the tolerance boundaries and are set by the system designer. The system is conceptual and, therefore, a construct of understanding. It is a framing of choice that presents ontological reality. It is artificial but not imaginary, theoretical but not ephemeral.

¹²¹ A Kuhn, 1974 in David S Walonick, , *General Systems Theory*, in <http://www.survey-software-solutions.com/walonick/systems-theory.htm>. (accessed on 15 February 2008).

CONCLUSION

The Distinction between Operational Levels of War and Operational Art.

The distinction between the hierarchical epistemology of strategic, operational and tactical levels of war and operational art enables the rejection of operational art as a level or function that translates tactical action into strategic success. This is not a rejection of the operational level, the linking of contiguous battlefields within a theatre, but an exorcism of a confusing military category. The omission of this level simplifies the mental construct of operational art. By removing the operational level, we are able to examine the nature of art, rather than trip over the imposition of a scientific form, a cognitive element (in this case the confusion of the operational level with operational art).¹²² Most people strive to maintain cognitive consistency; we want our thoughts to fit together and reflect the facts we see in and infer from the world around us. The creation of assemblages and frames provides a structure to reflect on the dialectic between desire and reality, between design and planning and ultimately between strategy and tactics. Tactics concern decisions of implementation, whereas strategy concerns decisions of consequence, the osmosis between the two regards decisions of formulation. This middle area adds quantitative substance to the emerging qualitative ideas.

Tactics without Strategy as the Noise Before Defeat.

Design is a verb and producing a strategy is a noun. In broad terms systemic design refers to the process, in specific terms, 'the strategy' is the final product of design.¹²³ As a process design is diametrically different to the reduction and simplification that is necessary in the mechanical form of planning. This approach to decisions of implementation maximizes

¹²² James Kennedy & Russell C Eberhart, *Swarm Intelligence*, (San Diego, CA: Morgan Kaufmann Publishers, Academic Press, 2001), 42, an introduction of the notion of cognitive confusion and cognitive consistency.

¹²³ US Army Doctrine makes a distinction between campaign design and a campaign plan; the latter being the matrix from which an Operations Order is crafted.

efficient use of time, mental energy and the synchronized orchestration of individual efforts to achieve a group product. This is different from design which seeks to embrace increasing complexity with increasing development. The function of this process is the structuring of patterns of learning through the use of narratives. The Form is the development of strategy to enable action. As understanding develops through the processes of destruction and creation, analysis and synthesis, information is employed in increasing complexity enabled through the use of assemblages. The theory of SOD has been described as the trinity of describe, problematize and frame.¹²⁴ However, this segregation is not hierarchical. This description represents the explanation of the theory of structuring patterns of learning. Although each can be interpreted as relating to system framing, creating the operational frame and then design, such a literal application and projection onto the process reduces its merit as a guide for the entire approach. Each is repeated at every sequential evolution of analysis and synthesis: all three in one. The process of self-education contributes to the production of a narrative. Firstly, as the ontology of the system frame including the trends and the limits of potential observed in the environment, then as the problematization, and finally the strategy. These frames offer context for investigation.

An independent theory, a new paradigm, will be developed as the explanation of the logic of the problematization. The problematization describes the process of tensions within our systemic understanding and our values. This becomes the logic, the challenge of destruction as a process. Action is bounded by the operational frame as strategic choice; a frame for action. The final act of design is the creation of a strategy. This employment of action is the employment of a theory, developed from systemic understanding, contained by an operational frame set against the challenge of the problematization. This is communicated in the strategy and is passed with all the narratives and graphics as a system of reference for subsequent planning. Design, as the process,

¹²⁴ BGen (Res) Shimon Naveh is discussion at SAMS between Jan – Apr 08.

is the translation of Logic into Form, desires into actions. It nests these functions as an integrated structure, a logic that is more pronounced than the traditional format of mission, commander's guidance, facts and assumptions. The process is both an exploration of learning and acting. Figure 16 illustrates the relationship between design, planning and operations as a process of learning that enables action.

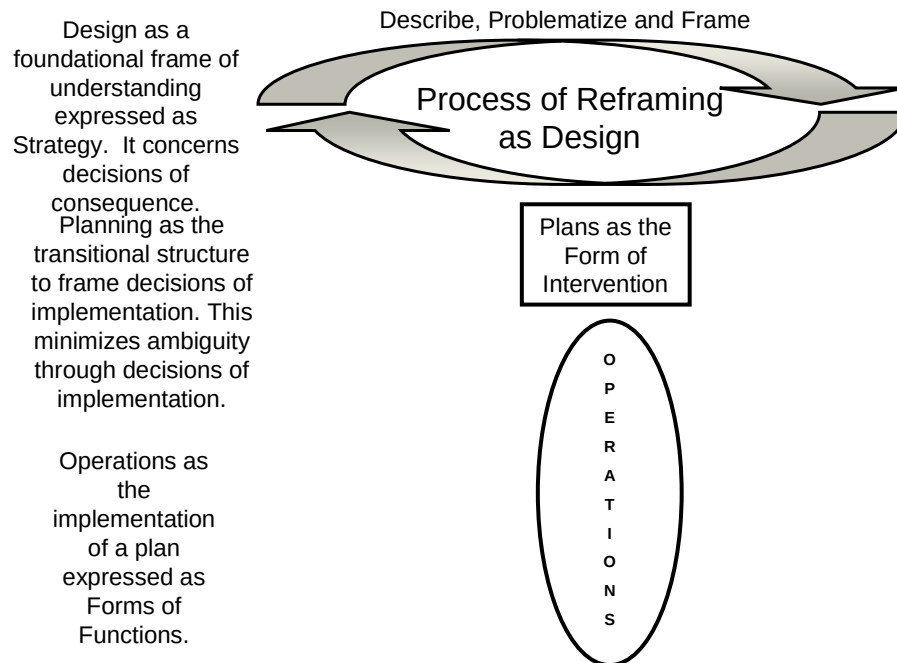


Figure 16. An illustration of the nesting of design, as a function regarding decisions of consequence and formulation, and planning, as the function regarding decisions of implementation. Operations are the expression of both through the form of action.

Design as Transformation; more than just a planning tool.

The inclusion of increasing complexity in the design approach is accompanied by cognitive ambiguity. Knowledge, the product of systemic understanding, as distinct from data or information, decreases anxiety. The rejection of prescriptive authority and absolute certainty means there is no clear path towards illumination. The Design Process provides a map for self-education within which meta-questioning acts as the compass for learning. This is a process of revelation, enabling designers to take positive control as they advance into ambiguity. This

control and mapping provides a system of reference. The systemic approach is the intrinsic value to planners as they deconstruct operations. Meta-questions provide the link between theory and praxis expressed through discourse. They frame the learning exploring the form, function and logic of the subject.

Meta-questioning enables designers to step outside the process and investigate both the subject and object, both observed and the observer. They help deconstruct method in relation to the design group and their environment and create a new praxis of learning; enabling learning about the learning. The additional benefit is the prevention of any theory becoming prescriptively applied, particularly the lessons from previous successful experiences, as dogma.

The unifying structure of a systemic approach links design through planning to action and then directs the learning back into an enduring frame as an iterative process. This cycle is illustrated in Fig 17.

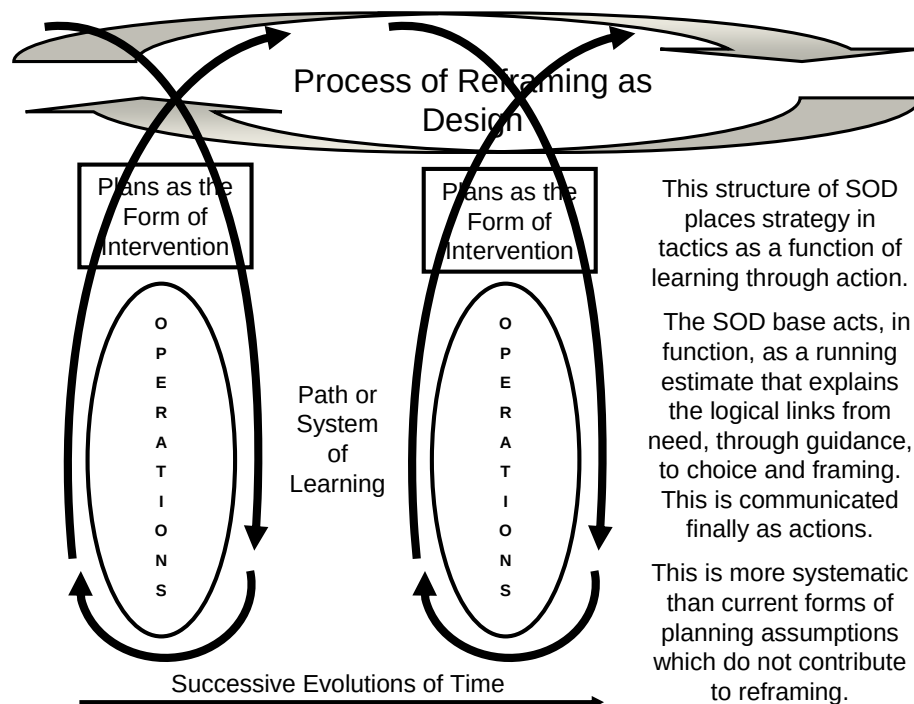


Figure 17. An illustration of design as foundation that enables reframing. This cycle is achieved through the conduct of operations as an explicit form to aid the function of learning. This does not preclude the iterative nature of this approach, one that encourages learning and

feedback at every occasion. It is not necessary, nor desirable to go through a complete cycle before organizations begin to enhance their understanding.

This protracted process of creating frames from which to act has merits that are not immediately obvious during the first course of action, the initial operations. The ultimate benefit and addition to existing practice comes to fruition during conditions that demand reframing. As a consequence of the stratified process, changes within the system can be contrasted with the understanding that framed the operations. Changes, both environmental or to the desires of the sponsor, can be directed against the system frame, the operational frame or the strategy itself. The ability to differentiate between these changes in circumstances: the difference between form; function; and logic enable appropriate counter actions to be applied to the environment. The ability to reframe, systemically rather than irrationally, employing the benefits of general systems theory, marks this approach as distinct from current practice.

Organizations, including the military, and their processes as systems, require change in order to remain relevant to their environment. As an open system the military is sensitive to environmental changes. Transformation may be instigated internally, by the institution itself through anticipation or reflection, or from external pressures, due to the changing nature of tasks for which the organization is employed. Transformation is an attempt to adapt to restore a balance or efficiency. The intended consequence involves changes to system variables; doctrinal adaptation and evolution. Systems theory forces planners to broaden their perspective, and to consider how decisions will affect the components of a system and its environment. The successful adoption of a design approach and the separation of problem framing from decision making will require institutional change within the military. This approach requires a culture that embraces and encourages a climate of resonant discourse; both horizontal and vertical in the military and significantly, across the inter-agency spectrum.

Towards a Military Application of the Philosophy of Design.

A military application of the philosophy of design is both possible and desirable, however, it is more applicable for the development of strategy, at any level, than as an operational tool. The significant benefits are: the making explicit that which is currently intuitive to most cognitive acts; this includes the recognition of the distinct nature of problem setting, solutions development and decision making; the construction of a system of frames as a point of reference that enables decision making when the situation changes; the creation of a common picture, a strategy that can be shared across the whole of government, and with sequential units as they rotate through tours; and finally, the forced recognition of biases and prejudices of the sponsor and the organization and culture that is conducting the desire, again making explicit that which is implicit.

The production of a common frame of reference empowers a military organization with a horizontal implementation structure to enable every sensor to be a potential decision maker. This flattening of the command hierarchy enables better decision making and the executing of more relevant actions. Operations conducted from designs will exorcise the 'game book' approach that is looking for set conditions and prepared for certain decision points. A design mentality, with a horizontal command structure, will enable everyone to observe changes in the environment and recognize reframing moments. This will create necessary decision points allowing commanders to execute strategy. A design approach that complements planning is the generic one of: defining the problem; developing a solution; evaluating both and then communicating a relevant strategy. This is enabled by a frame of learning and contributes to a frame for action, the executable plan. This simple model is illustrated in Figure 18.

A Design Process for Developing Strategy

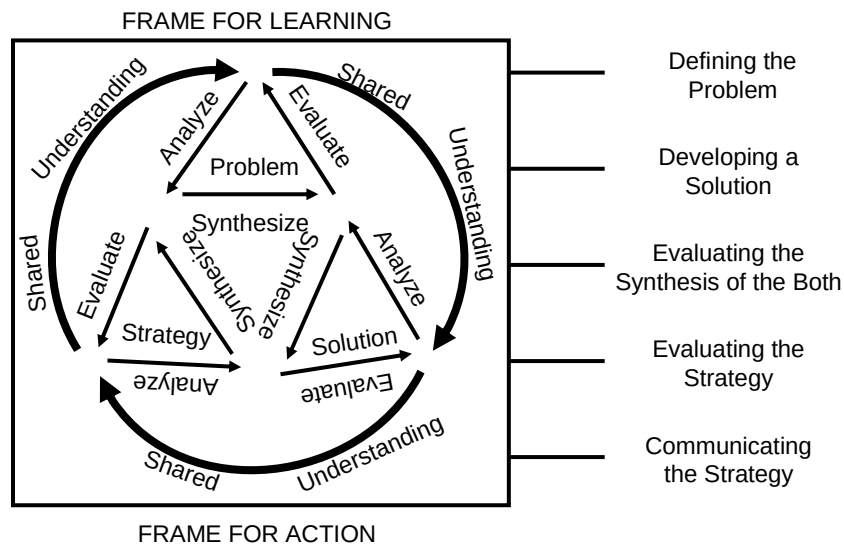


Figure 18. A generic military design approach to developing strategy.

A systemic perspective incorporates Godel's Theory of Incompleteness as the recognition that any logical model of reality will be incomplete and must be continuously refined and adapted in the face of new observations.¹²⁵ In this respect, discourse is not about winning arguments, but being able to present alternative perspectives that may be more relevant to the emerging condition. It creates space for decisions where previously there were only a few, pre-ordained moments. This process of learning through action is an OODA loop in another form. However, it explicitly separates problem framing from decision making. By specifically segregating decisions of implementation, the form of action from matters of consequence, the military adoption of the philosophy of design creates the space for the designing, rather than the planning of strategy. This should logically manifest itself in a more cautious expression of strategic intent,

¹²⁵ John R. Boyd, "Destruction and Creation" (unpublished thesis, September 3, 1976), <http://www.goalsys.com/books/papers.htm> (accessed March 21, 2008), 4-6.

a reduction in the Euclidean certainty of Newtonian actions.¹²⁶ The nature of networks and swarming is captured by Deleuze's understanding of the rhizome. This characteristic of multiplicity is expressed in the nature 'of becoming' the concept that something is never static but fluid and without boundaries but bonded by the unifying logic of these connections. Future operational designs should embrace this concept of emergence. "The rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines."¹²⁷ Future designs with phases beyond the immediate will only be dotted and exist in largely name only. The strategy will explicitly require reframing, following action prior to implementation. The employment of this design philosophy will deliver an ability to design strategy, at every level as the expression of operational art.

¹²⁶ In relation to the expression of operational art described by Lloyd and Jomini where acts are bound by their geometric and causal relationship leading to literal determinism as an expectation of effect.

¹²⁷ Deleuze, Gilles and Guattari, Felix. *A Thousand Plateaus; Capitalism and Schizophrenia*. (Minneapolis: University of Minnesota Press, 1987), 9.

APPENDIX 1

Glossary of Terms.

- A Priori.** From Latin, ‘what comes before.’ An *a priori* argument proceeds from causes to effects or from ground to consequent. A judgment or fact that is independent of all experience and impression of the senses for understanding its terms. Relates to arguments, propositions and ideas. An *a priori* argument is one in which the conclusion follows deductively from the premises; a mathematical proof (analytic). (Ree, 2005)
- A Posteriori.** From Latin, ‘what comes after’. An *a posteriori* argument is one that moves from observed effects to unknown causes. An empirical observation that can be validated through experience, fire is hot, but not explained; inductive. (Ree, 2005)
- Analytic.** From Kant, a proposition which following negation results in logical absurdity. Truth is clear from an analysis of the terms. All analytic propositions are *a priori*.
- Assemblage.** An ontological system created by a recognition of the processes that connect the lines of exteriority, intensive attributes. This is contrasted with generic systems, an exaggerated distinction, that are represented as the pattern of the lines of interiority, intensive properties. This may be an epistemological system, a categorical hierarchy e.g. amphibians, an abstract system that is a process of organization of knowledge, rather than an ontological relationship. The wasp-orchid is the example Deleuze employs. See *Heterogeneity*.
- Category.** Something that exists on its own, an ultimate class, the highest genera of entities in the world. Aristotle defines it as, ‘that which is neither predicted of a subject nor in a subject’. An attribute that can belong to entities of one category cannot be entities in any other category. In the philosophy of Deleuze, assemblages are systems that are constructed through the smooth relationship of exteriority. A design process creates ‘new systems’ that cross traditional categorical boundaries. In a pejorative manner, categories are contrasted to assemblages as representing ontological relationships rather than epistemological ones. See *essence*. (Ree, 2005)
- Command as Rationale.** Arriving at the identification of the most effective command structure through a logical deconstruction of the form, function and logic of the streams, tensions, potentials, and operating logic of the rival system, friendly system, and the system framework. Used in the deconstruction of the systemic frame to construct the operational frame and in the building of the organization that employs the design.
- Contingent.** Neither impossible nor necessary, i.e., both possible and non-necessary as in contributing and desirable. Used in relation to casual theory and in contrast to necessity as dictated by determinism which exists in logic and mathematics. Humans respond to reason and rationale rather than causal relationships, so effects are predicated on contingent properties rather than causal relationships, as the concept of determinism is illusory in a social context. For the military planner this limits the Newtonian certainty of actions and effects.
- Complex Adaptive System.** A complex system whose parts can evolve and adapt to a changing environment. Normally involves biological or artificial intelligence components.
- Complex System.** Any dynamic system composed of many simple, and typically nonlinear, interacting parts.

- Complexity Theory.** The theory relating to any dynamic system composed of many simple, and typically nonlinear, interacting parts. A complex adaptive system is one whose parts can evolve and adapt to a changing environment. Normally involves biological or artificial intelligence components.
- Deconstruction.** The process of reading texts ‘against themselves’- to seek out contradictions and gaps. A form of analysis. It is not a synonym for reductionism as analysis through simplification, the withering down to the essential parts. In the philosophy of Deleuze and Boyd, deconstruction contributes to the process of disjuncture, taking apart at the joints and deconstruction of categories. It is followed by synthesis and the creation of assemblages.
- Desired System State.** The movement of a system along streams that are most likely to result in the desired potentials of the friendly system. Related to *potential*.
- Drifting.** This concept is taken from urban architectural theory. Drifting is the phenomenon of the novel use of space not as the architect had originally intended. The example of dockland warehouse conversion into modern housing is ideal. The significance of the drift, is not simply the changing in form of the building space. It is the metamorphosis of the function and logic of the environment. The entire area is transformed, the use of space change, the character evolves.
- Einstellung.** The frame of a problem is the set of assumptions and attitudes with which you approach it. Making assumptions about possible solutions to a problem can be a barrier to creativity and compound difficulty. These limits are a self-imposed rigidity; they are the frame of the problem- the *einstellung*.
- Emergence.** Movement or direction of a system within the framework that manifests a new potentiality within the overall system. Emergences may be positive, helping the friendly systems to achieve their desires, or negative, threatening the movement of friendly systems in their desired direction. This relates to ‘assemblages of becoming’ in Deleuze.
- Empiricism.** An argument that follows from experience, inductive. A conclusion that is contingent on conditions (empirical) and therefore not necessary. (Ree, 2005)
- Epistemology.** The philosophical study of knowledge, the production of a certain set of criteria by which something can be said to know something. In systemic approach epistemological is used in contrast to ontological as something which has merit in the ordering of information rather than necessarily in the representation of who the object is present in the world. These mental conventions are useful in everyday life, but are representation rather than presentation of reality, and are one step removed. In the design perspective they provide a less ideal platform for design. (81)
- Essence.** The set of necessary and sufficient conditions for a thing to be a member of the set of things to which it truly belongs. In the philosophy of Deleuze and DeLanda essence is replaced with the thought attuned to intensive properties through the lines of exteriority heterogeneity. A nomadic essence. Equivalent to ‘thing’ or ‘individual’ (as opposed to properties or relations), or reality (as opposed to appearance). Originates from Aristotle’s notion of ‘nature’, ‘essence’ or ‘being’. In Deleuze the lines of exteriority that forms the beginning of a process of stratification. In contrast to *predicate*. See *category*. (82)
- Extensive.** See Intensive.
- Exteriority.** The condition of being outside a boundary, know but not yet captured. Belonging to the outside world, but not of one’s exclusive domain. In thought, the action of the war

- machine, whose smooth thought attacks the form of interiority of state thought. Not an opposition, but a force, outside thought is a force that destroys. (84)
- Form.** The outward expression, form of something that indicates its essence. The set of necessary and sufficient conditions for a thing to belong to the set of things to which it truthfully belongs. In *A Thousand Plateaus*, form is a straight jacket for matter- the striated. Often the form of something is acted on in the misapprehension that actions will change its function. (89)
- Frame.** A construct, either ontological or epistemological, but in both cases theoretical. A structure that provides a point of reference. See Systems framing.
- Function.** The processes a form provides or delivers. How it relates to the constituent parts of an assemblage.
- Heterogeneity.** Natural order within multiplicities and rhizomes: jumbled-together, mixed-and-matched. Rhizomatic assemblages connect heterogeneous elements but leave them that way so that each retains relative independence and can be plugged simultaneously into other rhizomes. See *assemblage*. (94)
- Homogeneity.** The condition of content in a stratum- the result of striation. (96)
- Intensive.** The internal properties of a system with regard to its immanent relations (density, boiling point of water). In contrast to extensive properties that are defined by an external measure or standard (length, volume). Extensive properties are divisible without a qualitative change in the underlying system. An assemblage is the relationship between intensive, internal properties, and changes to these multiplicities results in qualitative change. Deleuze's ontology claims that intensive morphogenetic processes give rise to actual or stratified entities whose extensive and fixed properties are the object of representation, and occlude the intensities which gave rise to them. In contrast to *Extensive qualities*. (101)
- Intervention.** Any action taken to create a new potential(s), or retard progress of the system toward an undesired potential(s). All interventions are designed to learn more about the system.
- Interiority.** The condition of being capture by a stratum, in contrast to Exteriority. (102)
- Logic.** The overarching aim or desire that guides the streams upon which a system operates. What gives meaning or logic to a system of form and function.
- Logistics as Rationale.** Arriving at an understanding of the potential energy within the system through a logical discussion of the streams, tensions, potential, and operating logic. The result of logistics as rational bounds the operation framework.
- Metaphysics.** Part of the Philosophy of Science (epistemology and ethics) questions relating to reality. What is fundamental in the order of knowledge, explanation and existence; the study of reality as opposed to appearance; what transcends experience. Relying on the a priori rather than empirical method. A new way of thinking about the world that is a presentation of the world, in contrast to a representation of the world, a mental abstract construct.
- Multiplicity.** An intensive multiplicity is an assemblage or complex system that cannot change past thresholds of intensive flow without qualitative change in the system behavior, that it is 'becoming'. Defined by the lines of flight or thresholds where qualitative change will occur. (117)

Meta-Questions. The process of asking questions that help structure learning. These enable the designers to stand outside the method and observe the process, their understanding and identify gaps in both. The development of answers to these questions takes the process further. It is part of the describe, problematize and frame continuum.

Ontological. The theory regarding what exists and the enquiry into its nature, the philosophical study of being. The relation between categories and attributes. It is used throughout this text to signify the existence of assemblages as they are presented through their relations of exteriority. This is contrasted to categorical systems that are expressed as the relation of interiority and a mental, epistemological construction. See St. Anslem's Ontological argument for the existence of God: as God is conceivable as omnipotent, as a necessary, rather than contingent existence, then God exists. In Deleuze the emphasis is on 'becoming' rather than 'being'. Ontology is dedicated to immanence rather than transcendence. The duality or binary nature of the philosophy (smooth and striated; nomad and sedentary; rhizome and tree) is heuristic and invoked in order to challenge one another, not a construction, but a necessary process through which they pass. (119)

Operating Logic. The overarching aim or desire that guides the streams upon which a system operates.

Operational Framework. A description of how the system can be moved along appropriate streams, capitalizing on both latent potential energy and planned interventions, in order to enable the desired potentials that lead to the desired system state.

Positivism. The school of philosophy that claims that the only authentic knowledge is that which is based on actual sense experience (*empirical*). A rejection of metaphysical philosophy as intellectual pretension as it can not be scientifically tested; it can not be 'proven'. Relates to natural law as the revelation of the hard sciences.

Potential. The possible occurrences, good or bad, that are a result of a stream or the convergence of streams. Potentials may be exploited within the system to bring the system to an acceptable state of operating. Related to *Desired System State*.

Predicate. From formal logic, the science of correct reasoning. That which is predicated of the subject of a proposition; the second term of a proposition is predicated of the first term by means of the copula- "Socrates is a man, predicates the manhood of Socrates". In this respect, the predicate is that which is determined by an early condition. For Deleuze the separation of predicates from categories is part of his philosophy of difference and the separation of presentation (the subject) from the representation (the proposition that is affirmed or denied about the subject). The consequence, or second order of an ontology, the relating or underlying condition. Relating to the rule of language; from Chomsky's theory of transformational grammar- with deep structure and surface structure. In logic, the distinction between *categories* and *predicates*.

Presentation. The ontology of sense experience and impression unadulterated by assumption or expectation. An assemblage that depicts the relationship through processes of exteriority, rather than relations of interiority as categorical attributes. Ontological reality, the presentation of the essence of a thing. The assemblage that presents the intensive processes as captured by the lines of exteriority that form assemblages. See Representation.

Problematization (noun). The problematization is the link from a systemic understanding to the construction of the operational frame: the first act of 'design' and the expression of strategic choice.

Problematization (verb). A [critical](#) and [pedagogical dialogue](#) or process that may be considered demythicisation. Rather than taking the [common knowledge](#) ([myth](#)) of a situation for granted, problematization poses that knowledge as a problem, allowing new viewpoints, [consciousness](#), reflection, hope, and [action](#) to emerge.

Rationale. An explanation of the fundamental reasons *for a particular entity*. (Sorrels et. al.)

Reference. Any source of information that can be used by the design team to assist in various rationales, to include human sources. The design team should identify required sources early in the design process in order to ensure that the common understanding is logical.

Reframing. See *System Reframing*.

Regulate. Manage outside interventions into the system, allowing desired interventions and filtering, retarding, or otherwise mitigating for undesired interventions.

Representation. The mimicking of ontological reality, replication of something through the depiction of its interior qualities (accidents), rather than its exterior qualities (essence)

Reterritorialization. The process of forming new territory, never to return to an old territory. Used by Deleuze to depict the becoming of multiplicities. (136)

Rhizome. A decentralized multiplicity or network. There are 6 principles of a rhizome: connection; heterogeneity; multiplicity; 'assignifying rupture'; cartography; and decalcomania (a process not a model). Two multiplicities can form a rhizome: the wasp-orchid. A root structure that is used by Deleuze to contrast the linear hierarchy of arborescent (tree like) structure of branching hierarchies. Flat organizations are more rhizomic than monarchies which are arborescent. The natural order within multiplicities and rhizomes: jumbled-together, mixed-and-matched. Rhizomatic assemblages connect heterogeneous elements but leave them that way so that each retains relative independence and can be plugged simultaneously into other rhizomes. They are without beginning and end. (136)

Rival as Rationale. Arriving at the identification and understanding of the key rival system (s) through a logical discussion of its streams, tensions, potentials, and operating logic.

Rival. Any system operating in direct or indirect contravention to the desired aims of the friendly system

Representation. The duplication or tracing of mental images of things composing the world, or more broadly the doctrine of knowledge, epistemology. The lines of interiority that represent striated thought. The expression of extensive properties that obscure the essence, the processes of interiority. Epistemological categories are used as an example of representation in place of assemblages, that are the becoming of presentation- the ontological reality. In contrast to Presentation. (135)

Smooth Space. The space of intensive process and assemblages, as opposed to striated space of stable systems. The form of expression of the nomad. Emergent properties, intensive becomings occur only in smooth space. It is uncontrollable by definition. It can be encircled, but as its qualities are made static they recede under the force of striating order. (143).

Sponsor. This term is used to denote the combination of the political decision maker and the function of the higher military commander. The paramount concept is the function of decision making, rather than legal power or authority. The purpose is to discourse with the originator of strategic needs, wants and desires.

- Stability.** Achieved when the system self-regulates. (The return of the Argonaut's framed system to pre-January '08 tendencies is the required level of stability – aka the minimal desired.)
- Strategic Raid.** Any action or actions designed to inject energy into the system in order to learn more about how the system operates.
- Stream.** A flow of events in time, an actor or agent, a movement, or any other tendency within a system to move in a certain, somewhat predictable direction if left unmolested. Potential energy in the system.
- Striated space.** As opposed to smooth, it is better to speak of an interchanging between the two. That which is captured in the lines of interiority. Striated space is first gridded and delineated, then occupied, by drawing rigid lines that compartmentalize reality into segments. All controlled to a greater degree or lesser extent through a nested hierarchy of centers. It is composed of centers, the idea that there are places of more and less importance. It imparts 'truth' and the notion that an immobile point is better than 'aimless' voyage: the migrant versus the nomad. (151)
- Substance.** Equivalent to 'thing' or 'individual' (as opposed to properties or relations), or reality (as opposed to appearance). Originates from Aristotle's notion of 'nature', 'essence' or 'being'. In Deleuze the lines of exteriority that forms the beginning of a process of stratification. In contrast to *predicate*. See *category*. (156)
- System.** A group of independent but interrelated elements comprising a unified whole: instrumentality that combines interrelated interacting artifacts designed to work as a coherent entity; a procedure or process of obtaining an objective; an ordered manner; orderliness by virtue of being methodical and well organized.
- System Framing.** Grouping independent but interrelated elements into a unified whole. Rationalizing strategic objectives in broad context and relating them to the specific context of the issue under study.
- Systemic Understanding.** This is the metaphysical investigation that leads to the creation of new assemblages as the presentation of ontological reality. While it is a mental creation, a product of the observer, it is epistemological, but not as a category applied to the world as authoritarian structure. It is a form of emergence.
- Synthetic.** The opposite of analytic. Judgments whether true or false can be denied without contradiction.
- Tension.** The energy between two interacting streams which creates both opportunities and challenges for the friendly system.

APPENDIX 2

Between the Striated and the Smooth Asymmetric Warfare, Operational Art and Alternative Learning Strategies. By Shimon Naveh

The large grey-metallic sheet of air-photo lay on the huge oval wooden table like a deceased dinosaur thrown out of its habitat by some primate forces. Marked bizarrely by a white label carrying the name Raphidiya, the upper left wing of the Kodak-paper trunk was splashed by a turbid stain of sour military coffee. The air, in the frosty florescent-lit room was heavily burdened with the odors of human sweat, boot-polish, rifle oil, and cigarette smoke. Fifteen pairs of somber eyes concentrated on a dark tight square on the lower right wing marked by the label Ballata, meaning *plato* or plate.

Aviv, (meaning spring in Hebrew, a rather strange name for a professional soldier) commander of 35 Para Brigade cut the heavy silence with his quiet voice: "There is reliable information indicating that a group of armed insurgents has moved recently from Nablus with the intention of establishing an operational base in Balata refugee camp... Central Command wants us to go in and uproot them!"

"Oohh", mumbled Amir, the tall, fair haired commander of Battalion X; "you mean go in and seize a built-up area? We have not done that since 1982, and as I recollect, we were not particularly successful on that occasion"...

"Well", responded Aviv thoughtfully. "Firstly, there is always a first time in war, as you all know. Secondly, this operation is not about seizing space, it is about preempting a problem, a ticking bomb! Thirdly, our real problem is not attempting something that we have not done before, but rather, freeing ourselves from a myth that has been debilitating the performance of state militaries for the last two centuries. Moreover, what worries me even further is the fact that no existing military doctrine can provide us, at the moment with a relevant conceptual reference.

Thus, we have to invent a new pattern of action, while relying exclusively on our own experience"...

"What do you have in your bag for us Shai you magic-man?" said Aviv addressing the Brigade S-2. "Well" said Shai, "Mainly bad news, intelligence, in this operation is beyond your worst dreams"... "Stop frightening us! There is a serious fight ahead of us, and we are short of morale anyway", grinned Aviv.

"We know that between 80 to 200 armed insurgents from various organizations left Nablus, in recent weeks, and established themselves in Ballata refugee camp. We don't know their exact whereabouts, we don't know their command organization, and we don't know their operational deployment. All we know is that they have established an urban guerrilla base within the camp enclosure."

"The authorities must be joking" mumbled sarcastically Roni, the decent, thoughtful commander of Battalion Y. "This contradicts everything we have been trained to do"...

"Wait!" said Shai, "We have not gotten to the worst yet". "Remember how we rationalized the insurgents' attraction to the urban sphere. It provides them with a natural base for operations against conventional forces; it affords them a human shield, which they cunningly manipulate; it is a natural hideout; an unlimited logistical base; a stage for spectacular brutality; a medium for disappearance. Built up areas are reflectors of the regular's form, and deflectors of the irregular's. Observing the addiction of state armies to conventional geometry and mechanistic order, on the one hand, and their phobia of casualties, on the other, subversive entities developed the doctrine that no conventional military will commit itself to a serious fight in the urban jungle. And, if worst comes, the regulars will either succumb to the town's striation, or be defeated by the counterproductive effect of their mass firepower. In fact, we ourselves have become victims of this mythological argumentation". Becoming suddenly embarrassed by his over enthusiasm, Shai took a deep breath trying to cool down.

Exploiting the lull in Shai's flow of speech, David, Z Battalion commander, fired a nervous question into the room compartment; "So why should a group of insurgents bother to leave the big town's haven and lock themselves in a remote, wretched ghetto like Ballata?"

"Well" said Shai, "I think they either want to test our nerves, or pull us into a bitter fight. Whatever option materializes, they think they will humiliate the IDF in the same manner Hezbollah did two years ago. If we refrain from a fight, Abu Amar's warriors and a community of untouchables gain a psychological victory. If we accept their invitation they believe they will embarrass us by bleeding us white. Since they expect us to come in the old style, mechanized formations in cohesive lines and massed columns, conforming to the geometrical order of street network pattern, Ballata, almost deterministically, becomes a Palestinian Stalingrad".

"Without being drawn into over-detailed speculation", continued Shai, "by attempting to establish a laager, I think they have been fortifying all entries to the camp, they have been mining and booby-trapping streets and alleys, both against soldiers and vehicles, and they have been gathering whatever fighting materials and resources they can. In other words, transforming Ballata into a castle, they have set the stage for a fighting spectacle in which they expect us, when attacking the enclave, to obey the logic that they have determined". A heavy silence overcame the audience.

"There is nothing I like more than a hopeless situation" uttered Roni ironically, the rest bursting into laughter.

"Actually, things are not that bad", said Aviv solemnly. "In fact, together with Tamir, commander of the 1st Infantry Brigade, I have worked out an idea that you may find relevant to the setting of the problem we have been hovering around. Our impression is that some unique cognitive aspects that have not been observed by the insurgents can be manipulated in a manner distorting both, their thinking processes, and their modes of behavior. In other words, if we apply subversive or critical thinking we may have a chance of formalizing the subversive".

Aviv rose up from his seat and approached the drawing board. "Look!", he proceeded, "They, the insurgents wrongly tend to misperceive their tactical (individual or team level of action) inconspicuousness (disappearance) for operational (system or organizational level of functioning) imperceptibility (absence). Their transition to Ballata is about fighting, and fighting is about physical, as well as conceptual cohesion. Moreover, this transition from a state of divergence (disappearance through non-contiguous deployment within a big town or city) to a state of convergence implies both a reframing of the relations between mass and space, and reexamination of the tension between disappearance and fighting. Once they attach themselves to an enclave, tactically we may not see them until we engage them in a mechanical sense. Yet, operationally, unconsciously they converge with the overall form (layout) of the enclave. So, we may not know the exact whereabouts of every fighting element, yet we have rationalized their institutional logic and conceptualized their systemic or operational form. That is not bad for a start, do you agree with me?"

"Thus", continued Aviv, "since the boundaries of the enclave reflect their operational form, we can design a complex pattern of maneuver (fractal) that will disguise our form from them, impose chaotic conditions on their cognitive process, and deconstruct or de-structure their operational form. In other words, striate what they discern as smooth".

"What worries me now are the following issues: Firstly, how we free ourselves tactically from the tyranny of tactical striation, or how we avoid the traditional dictate of channeling our fighting units into linear streets and alleys? Secondly, since we cannot afford ourselves the utilization of our most advantageous resource, firepower, and warfighting will be on even terms with our subversive rivals, how do we manage to disguise our tactical form from them, while forcing them to disclose theirs?"

"Well Aviv" interrupted Amir, "while you were developing your operational ideas we did some deliberation on pragmatics of warfighting. If you are ready to compromise on some principled sensitivities, and overcome some tactical mind-sets I think we have a revolutionary

solution to the tactical problems you indicated. Two of my boys, a platoon commander and his sergeant, both from kibutz Giva'at Haiim think that once we penetrate an urban enclave, we should conduct our tactical movements through the houses or buildings and not by them. Our experiments with this new mode taught us two things. First, we need to organize ourselves for breaking through walls and movement through houses of individual families. Secondly, navigation and orientation must be thought through institutionally".

For the second time, silence settled in the compartment. Aviv, in his usual manner of discursive command addressed each of the participants for his individual opinion on Amir's concept.

Following the remarks of Nimrod, the last of the participants to speak (commander of the reconnaissance company), Aviv turned to Shmulik, the brigade S-3 and summed up his thoughts.

"Since we have been given only three days to complete our preparations for the operation, the following principles will guide our planning, training and organization. The difference between what emerges in front of our eyes, inviting our rationalization, and our institutional paradigm concerns many aspects like, organization, doctrine, moral values, forms of function, and so on. Realizing we are amidst a transition phase, I would like to highlight some critical issues that can promote our learning, as a military institution, and feed our reflections in the operation, and in the future. Unlike our idealistic tradition which, perceived war in binary terms, this campaign is going to be a very long one, and end, in the far future, in a kind of new equilibrium rather than decisive results. If we do not change our current discourse on intelligence we are bound to fail. Our rivals, or enemies as they are being referred to, are not just ontological objects for action. Operationally speaking, they are a logical medium for systemic deliberation, and unless we construct them as conceptual artifacts we deprive ourselves of the basic conditions for designing our own logic. Moreover, no intelligence apparatus is capable of providing us, prior to operations against subversive rival with precise and relevant information. Therefore, we need to explore the implicit rather than explicit variables, and complement the production of

intelligence, or the learning of the rival in the course of the operation, through the application of maneuver. Finally, we must set our institutional learning to comply with the dialectics of unique context – singular pattern, in the same manner that we have done here today."

"We will apply a fractal maneuver swarming simultaneously from every direction and through various dimensions on the enclave of Ballata. We will completely isolate the camp, in daylight, creating the impression of a forthcoming systematic siege operation. Our fire-policy rejects the use of tanks and artillery, machinegun fire is allowed in conditions providing a clear field of fire, precise fire, and targets that are detached from buildings. Remember, due to the poor quality of construction, the buildings cannot sustain even low caliber single shots. I assign the western sector to Yoni who will command Nimrod (reconnaissance), Udi (parachute anti-tank company), and Guy (parachute sappers), the northern sector goes to David, the eastern sector I assign to Roni, and the southern sector to Amir. Remember, we are not in a hurry; this operation is not about ideal modes decision. We have to avoid casualties among civilians at all cost, kill or capture the combatants, while avoiding casualties in our own units. Once we have crossed the littoral, each unit (company size combat team) reflects in its mode of action, both the logic and form of the general maneuver, this is what fractals are all about. According to logic implied by this new form of maneuver, each unit will combine in its operation three components, observation teams, sniping teams, and teams who are supposed to attract the attention of the insurgent fighters. Our movement through the buildings will push them into the streets and alleys, where we will hunt them down. By doing that we will smoothen the intrinsic striation of the enclave".

David, Aviv's alter ego and the senior amongst the unit commanders exploited a respite in Aviv's brief and popped in; "What is crystallizing here is exciting, yet extremely challenging in terms of execution. I would like to illuminate some practical aspects concerning the relations between cognition and maneuver in the context of the current operation. The prevailing maneuver paradigm is about geometrical order, physical cohesion, and massed firepower. Its conceptual coherence is embodied in its formal simplicity. Moreover, since the similar patterns of space are

being utilized by the competing symmetric contenders, the rationale of emerging operations is deterministic and the problem of self-orientation, both geographically and cognitively, by individual tactical commanders is a minor challenge. Once we shift from modes of action based on presence to modes of action based on disappearance, and from maneuver framework reflecting Euclidean geometry to maneuver framework reflecting geometry of complexity we magnify the space for exploiting potential, yet at the same time we pull the cognitive challenges for warfighters to new extremes. Since every unit commander is an autarkic fractal component within an emerging fractal system the cognitive problem of self-orientation becomes three fold. First one has to refer, at every moment of the evolving operation his relative position to the geography. Second, one has to refer, at every moment of the evolving operation his relative position to sister units functioning within the relevant operational space. And, thirdly, one has to draw, at every moment of the evolving operation the systemic implications from his positioning in relation to the logic of the emerging maneuver as a whole. The first is about navigation, the second is about orientation, and the third is about systemic awareness. I mean awareness not in the sense of recent American clichés but a cognitive quality implying synthesis. Therefore, we need to prepare navigation aids, to invest in developing common spaces of understanding in the fighting units, and to design a command architecture enabling dynamic learning in action".

A wide smile spread across Aviv's pleasant face. "One last issue before we depart. We know where exactly lies the allegiance of the Palestinian refugees living in what has become an enclave. Yet, remember they are victims not only to our wrath but also to the sympathy of the insurgents who exploit them. In other words, a most deadly game in which they are the ultimate victims, in every sense has been imposed on them. Be careful!, Show respect! And, pay attention to their pragmatic needs!"

"Any questions or remarks at this point?" asked Aviv, "well there is a lot of work ahead of us"...

With these final remarks the war council dispersed.

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