Design: The Modern and Postmodern Divide Considerations on a Second Generation Design Model for Future Militaries

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Figure 1: Framing Pre-Industrial, Industrial, and Post-Industrial Frames for War

Three War Movements Framed for a Design Discussion

Limited Wars
Rules-based
Oral/tacit knowledge transfer
Mechanical, linear
Simplification (cause=effect)

Attrition-based Total War
Military Science
Professionalization (academies)
Engineering, reductionist
Complicated (cause and effects)

Asymmetric
Emergent
Critical Reflection
Complex/Chaotic
Dynamic Change

Classical Military Movement (antiquities through late 1600s-1800s)

Strategic intent, order of battle, and tactical directions; no formal military education or academies; no doctrine; learning through apprentice and mentors.

Engineering focus on reducing complexity in war. Formal military schooling, doctrine, organizational forms.

Modern Military Movement (1800-1990s)

Post-Modernist Military Period (2000+)

Design

Wars could be started and potentially concluded within a single battle, or across a series of localized battles. Larger conflicts still had tactical battles isolated in time and space.

Wars required an 'operational level' due to time/space and technology. Few conflicts resolved in single battles. War had a blend of modern and classical qualities; increased complexity.

Wars no longer adhere to modernist processes exclusively. Greater paradox, complexity, emergence; non-state entities and networks challenge traditions.

Figure 2: Naveh's Original Systemic Operational Design as used by the IDF (2000-2005)
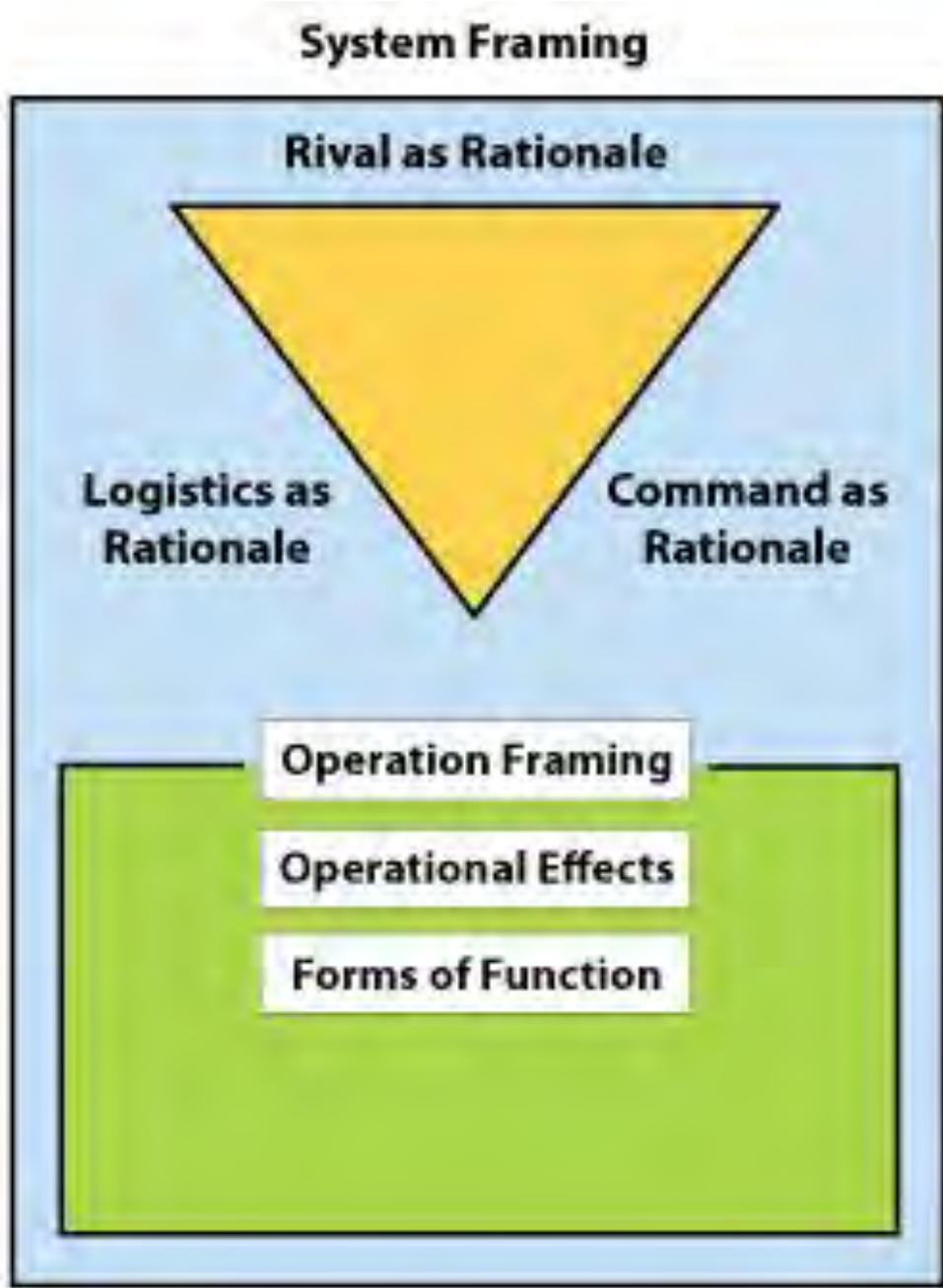
Figure 3: U.S. Army Design Methodology (Field Manual 5-0, Operations, 2010)
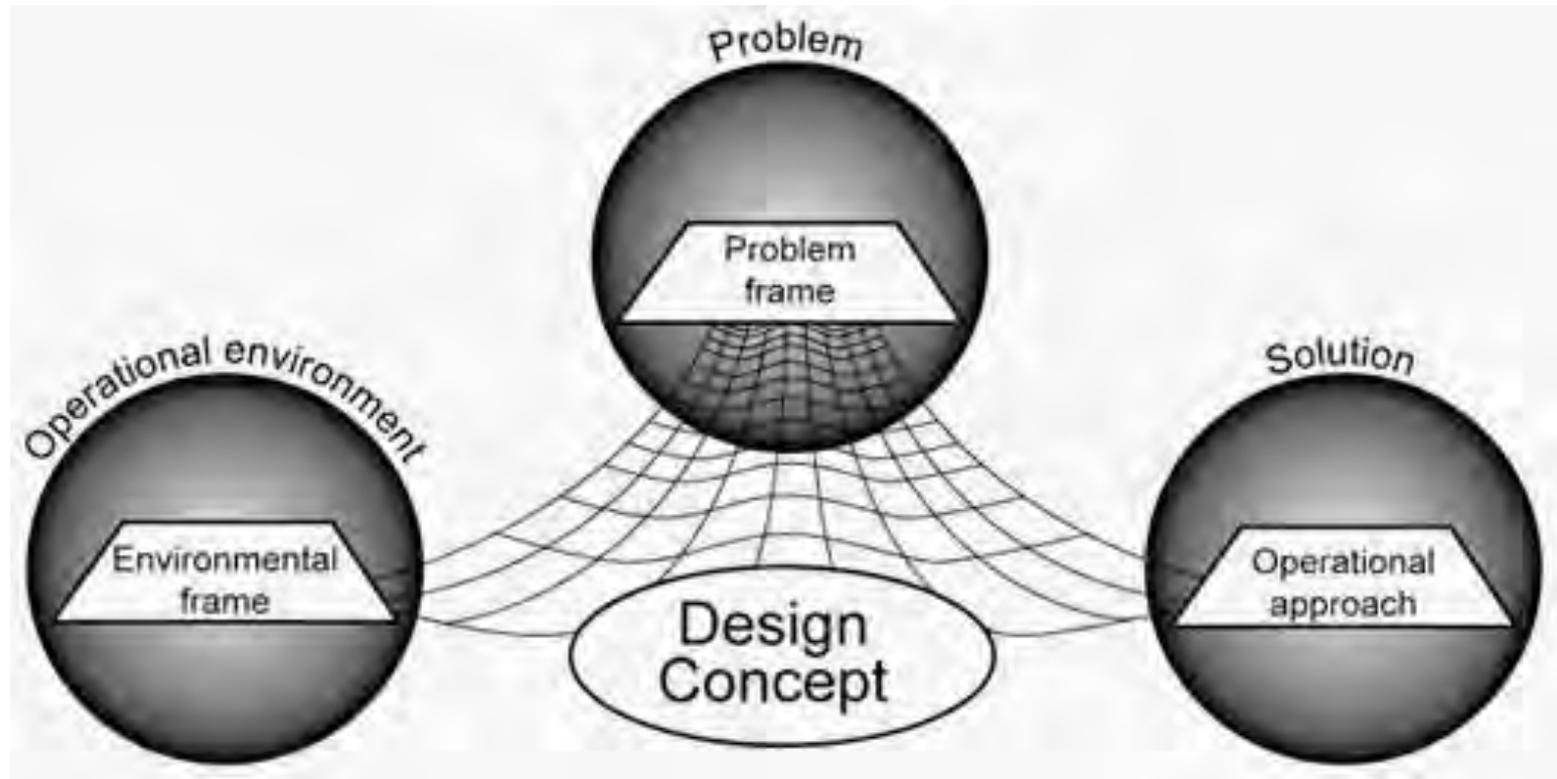
- *"Three Ball Chart" simplifies Naveh's SOD depicted in Figure 2*
- *IDF's elements of 'rationale' removed, with frames adhering to system thinking and analytic processes (objectivity) as offered in 'Commander's Appreciation and Campaign Design' and other Army doctrine*
- *Maintains 'sensemaking, idea making, decision making' logic that underpins ADM's efforts to generate new solution sets*

Figure 4: Australian Adaptive Campaigning Concept and John Boyd's OODA Loop

Adaptive Action

Figure 9. The Adaptation Cycle

Boyd's OODA Loop (circa 1980s-1990s) adapted into Joint Doctrine

Adaptive Action graphic source:
http://resilienceandsecurity.blogspot.com/2012/05/could-this-be-resilience-cycle-or-just.html

OODA Loop graphic source:
http://www.austinimpact.com/wp-content/uploads/2015/04/ooda-loop.jpg

Figure 5: Stanford Design Methodology, ADDIE and AGILE models for Civilian Design

The Stanford d.school Design Thinking Process
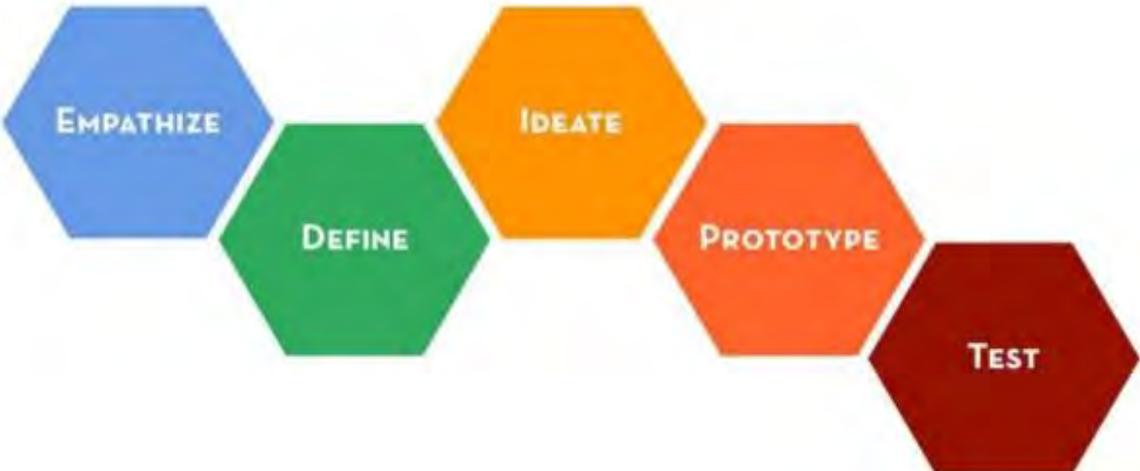
AGILE Model:
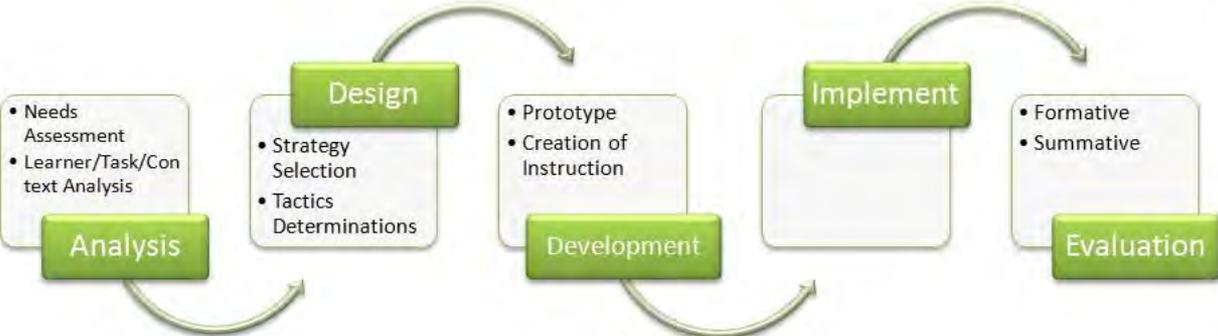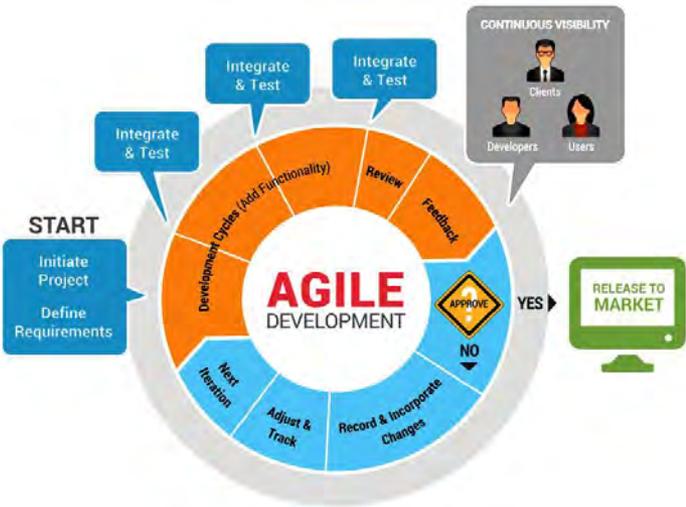
ADDIE Model:

Graphic source for Stanford Model: http://www.slideshare.net/wellbeme/triple-aim-design-thinking-stanford-medx-2014.
Graphic source for ADDIE model: http://nschutte.com/wp-content/uploads/2010/01/ADDIE-model.jpg
Graphic source for AGILE model: https://dreamztech.com/tag/agile-model/

Figure 6: SOD Versions 2 and 3

SOD Version 2 (~2006-2013)
"SDI"- Theory about Theory

System Framing

Legacy	Current	Desired
Drawback	Drift	Potential
	T4	Initial Strategy

Opposition System

Cognitive Transition Conditions

Operation Framing

Aesthetics Configuration
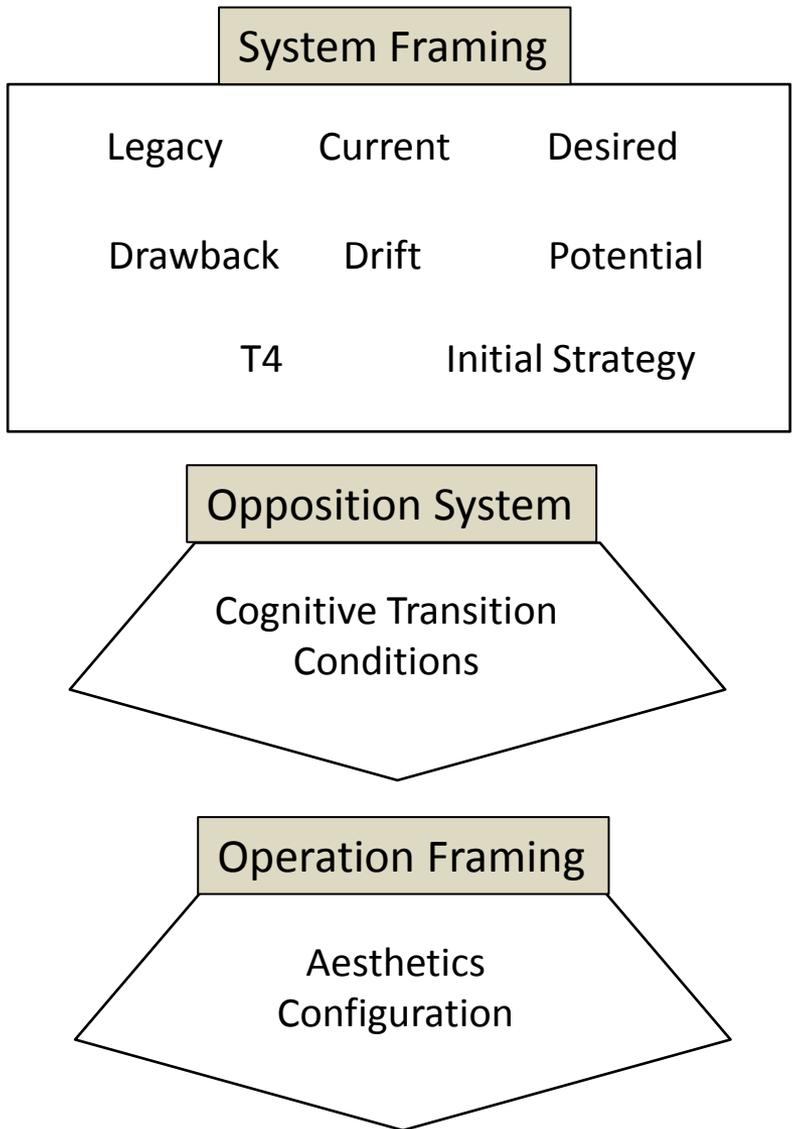
SOD Version 3 (2013-present)
"Z-Pattern" or "Disruptive Thinking"

Complex Emergence

1
Understanding System

2
Opposition System

3
Strategic System

4
Operation System
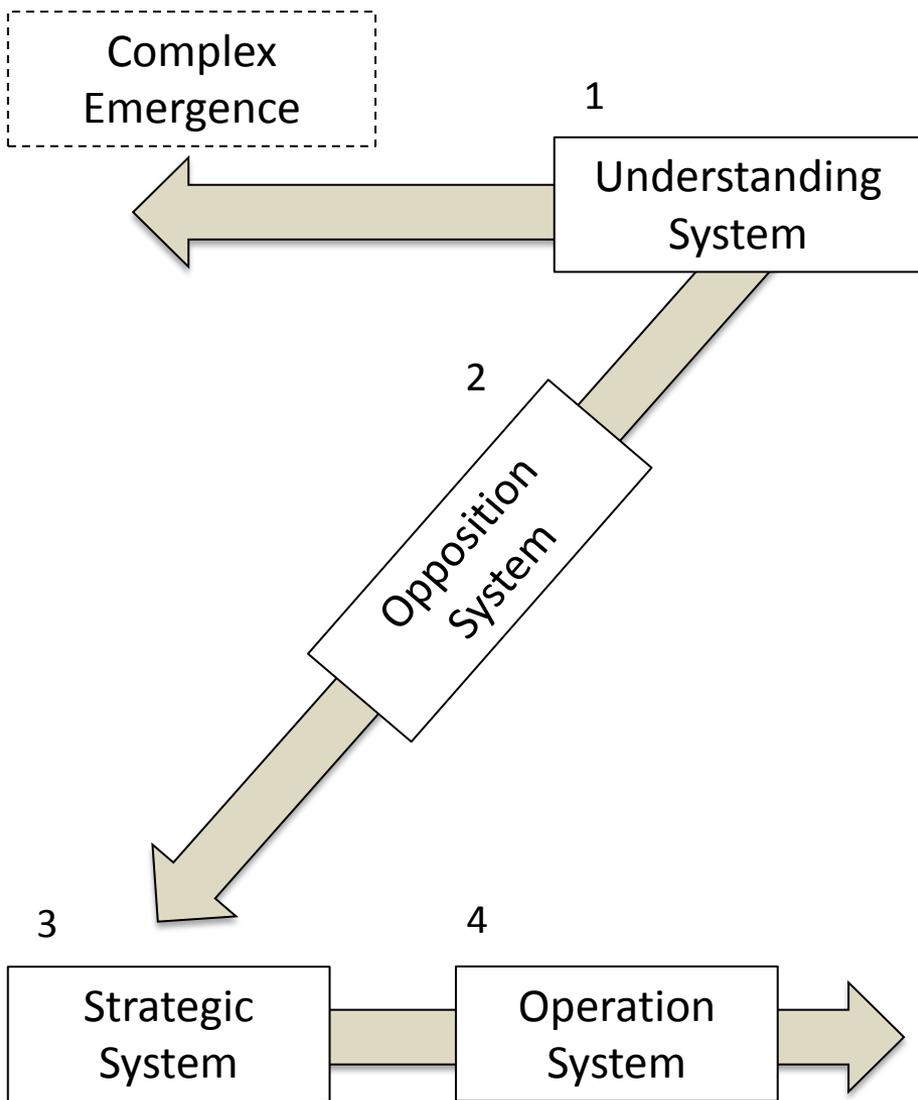
Figure 7: First and Second Generation Design Models

First Generation Design	**Second Generation Design**
• Attempts non-linear; in practice becomes linear (and iterative) • Design "reframe" rebuilds the content, but *not the design form* • Design begins and ends with clear iterations that are susceptible to institutionalisms (planning) • Displacement of concepts interrupted by dominant paradigm imposing doctrine, shared lexicon, and other institutional concepts • Reverse engineering remains implicit • Goal-centric strategy prevents emergent design from occurring	• Emergence built into methodology as well as epistemology • Nonlinear; with no start or end prescribed • Notion of 'drift' implicit throughout entire design • Reframe becomes a reframing of both ***content and form*** • Design is the process; deliverable becomes what is needed for organizational learning- not necessarily a planning deliverable • Displacement of concepts encouraged • Emergent strategy; ***emergent design frames available*** • What is needed will be discovered during the design

Figure 8: Starting with a Metaphor for a New Design Epistemology

Explorer with Compass and Edge of Map
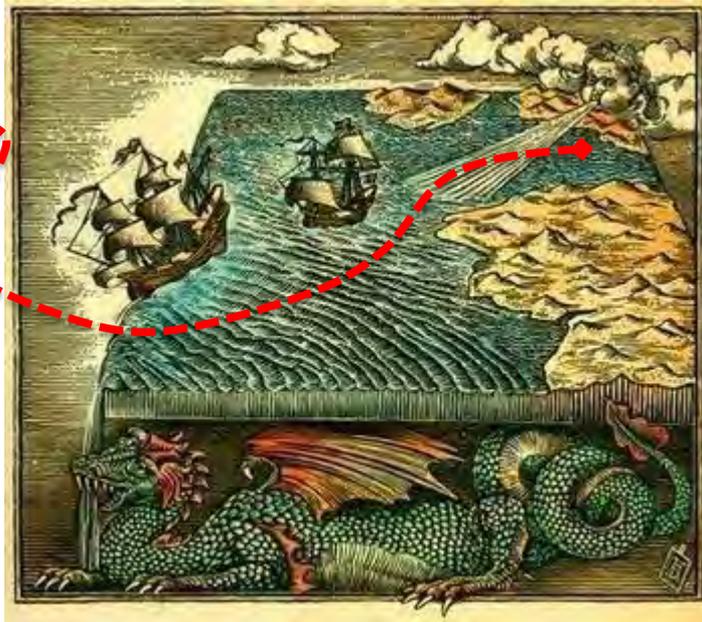
Passing beyond the edge of the known map puts the explorer in discovery mode with only emergent strategies and unpredictable opportunities. The compass aids in rendering a new map, yet in the act of making a new map, the explorer takes a new journey that is not sequential, in different directions.

Merchant with Map and Compass

Drift occurs (emergence, complexity, adaptation) yet the map provides stability and predictability to even the roughest seas. The merchant uses experience and sequential processes to accomplish difficult journeys over familiar terrain.

http://static.tvtropes.org/pmwiki/pub/images/rsz_world-flat_5884.jpg

Figure 9: The Compass Metaphor for Displacing Concepts on Design Methodology

Army Design Methodology might have: N= Environmental Frame; S= Problem Frame; E= Operational Approach; W= Reframe
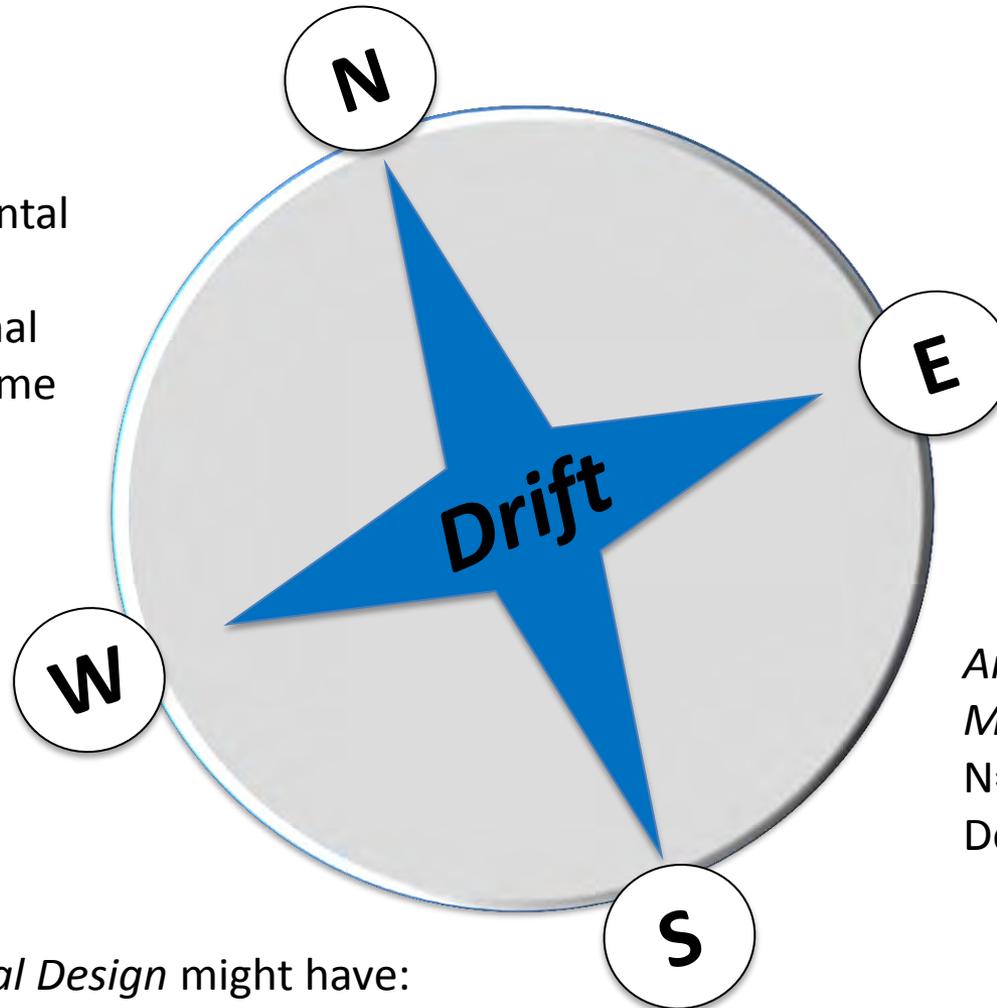
An Adaptive Campaign Model might have: N= Act; S= Sense; E= Decide; W= Act

Systemic Operational Design might have: N= Rival as Rationale; S= Command as Rationale; E= Logistics as Rationale; W= Operation Framing

A Civilian Inspired Design Model might have: N= Empathize; S= Ideate; E= Prototype; W= Test (with additional steps as needed)

N

E

S

W

Drift

Figure 10: Nonlinear Design Process for Second Generation Design Models

One Design iteration might move from N, E, S, W, and exit with a deliverable….
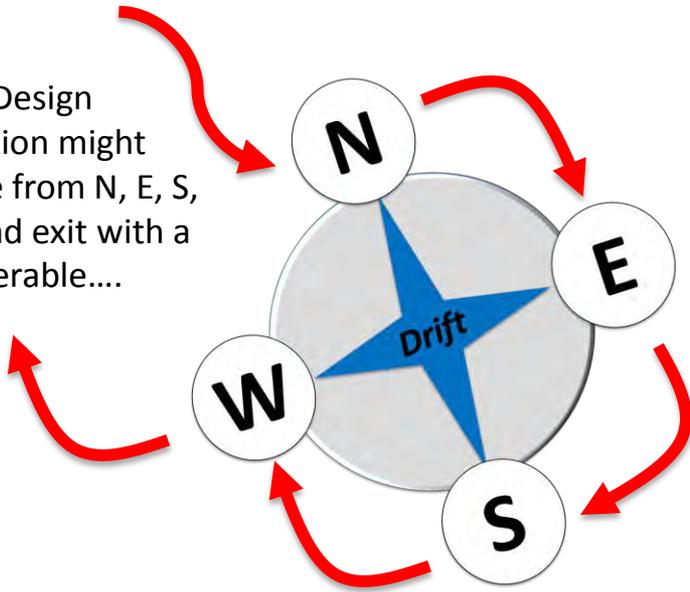
Another might begin with E, then move to W, then N, back to E, then exit without using S…
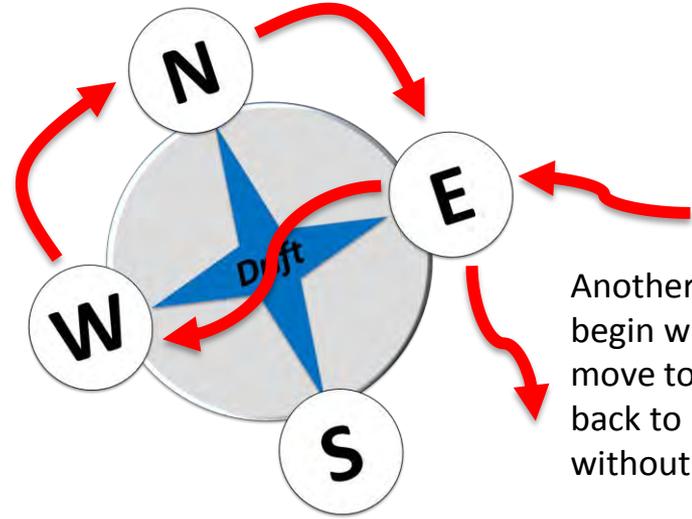
Some design journeys might have extensive paths all over the compass….
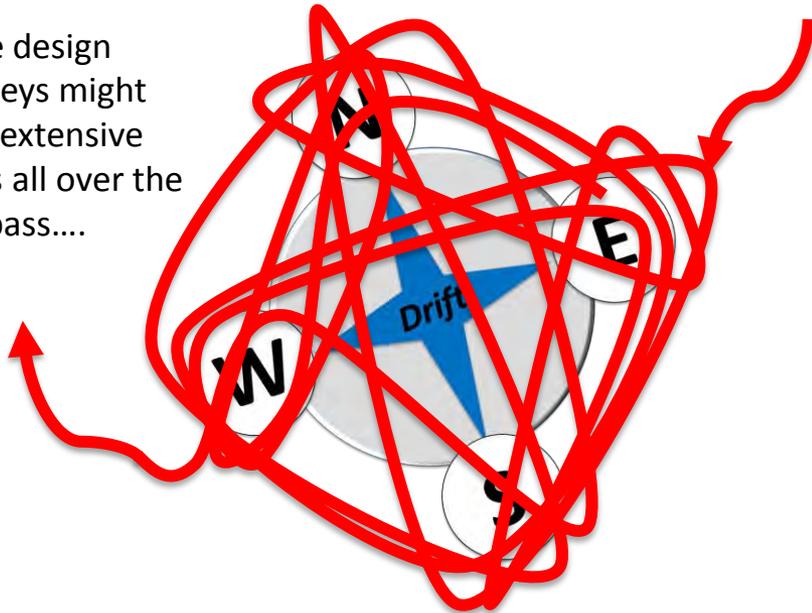
Every second generation design process is independent of all others…
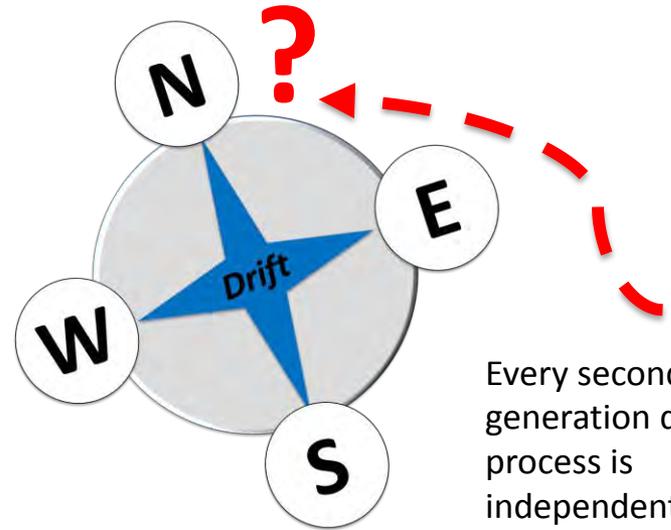
Figure 11: Reframes and an Emergent Epistemology for Design

1 The first iteration might use a SOD structure at first…

Rival as Rationale

Logistics as Rationale

Command as Rationale

Operation Framing

2 With the first re-frame abandoning some of the SOD concepts and adding civilian design components…

Rival as Rationale

Prototyping

Empathize

Operation Framing

3 Later in the process, some emergent design experimentations in reframes might introduce novel design concepts previously unexplored

Novel Concept X

Proto-typing

Novel Concept Y

Operation Framing

4 The final design iteration might require an emergent methodology that cannot be understood at the beginning of the design. *These reframes **change the design methodology** (the form) with the content*

Novel Concept X

Novel Concept W

Novel Concept Y

Novel Concept Z

Conclusions:

Explorer with Compass and Edge of Map

**Merchant with Map and Compass**
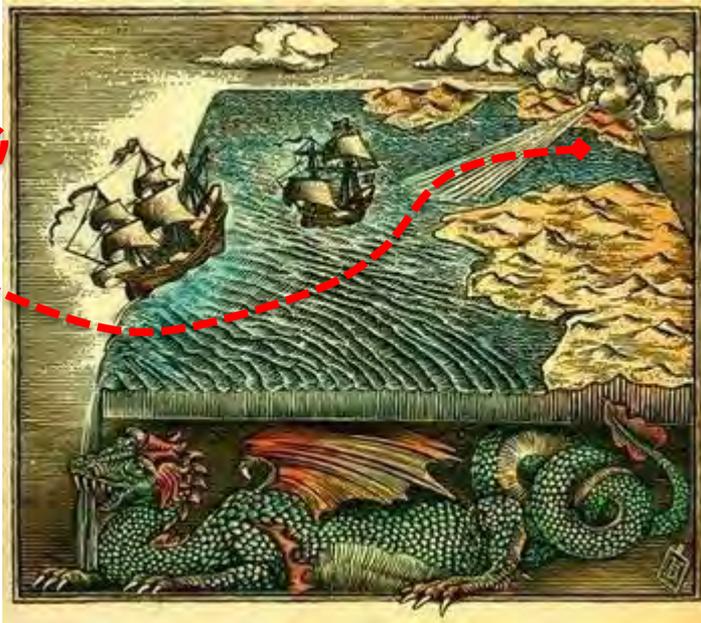
Second Generation Design Models:
- Complex Adaptive Contexts
- Emergence
- Learning through Design
- Epistemology forces methodological adaptation/innovation
- *Novel discovery tends to be misunderstood by merchants seeking things already on the map*

Analytic Based decision-making and problem-solving:
- Simple and complicated contexts
- Gaining stability provides for predictive methodologies
- Vulnerable to change, complacency and adaptation
- Many military processes require this

Questions?