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Design for Napoleon's Corporal

by Dale C. Eikmeier

Napoleon recognized how vital it was to have an enlisted soldier in the planning process. During every Battle Plans briefing Napoleon would have a Corporal shine his boots knowing that the Corporal was listening. Once the General Staff finished the brief, Napoleon would look down at the Corporal and asked if he understood the plan. If the Corporal answered, Yes Sir! The General would have his Staff execute the plan. If the Corporal answered, No Sir! The General would have the General Staff rewrite the plan.¹

This explanation of FM 5-0's Design is for the Everyman, or as the title suggests the proverbial Napoleon's Corporal. It is for those with a need to use Design but lack a 100 plus hours of specialized Design instruction. The focus here is on the "how to" techniques of Design rather than its cognitive theories. More simply this is about telling time, not building a watch. The techniques offered are only suggestions or aids, not prescriptions. These techniques are meant to serve as start points or considerations as the Design process starts and hopefully contribute to a better Design outcome.

Critical Thinking, Creative Thinking and the Nature of Problems

FM 5-0 says "Design is a methodology for applying critical and creative thinking to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them."² Therefore the prerequisite to applying Design is to have a basic understanding of critical and creative thinking and complex, ill-structured problems.

A complete discussion of critical and creative thinking is beyond the scope of this article. However, the following is a start. A critical thinker raises vital questions and states them clearly and precisely; gathers and assesses relevant information; then comes to well-reasoned conclusions; tests those conclusions; and is open minded to alternatives.³ In other words critical thinking is through reasoning held to rigorous standards. Creative thinking is about maximizing the ability to think of new ideas and includes the process of exploring multiple avenues of thoughts or actions. Simply put creative thinking is being open-minded and creative. Design then applies both critical and creative thinking to complex ill-structured problems. This brings us to the second part of the prerequisite, what are complex ill-structured problems?

Problems have two components, complexity and structure. Complexity deals with the number factors or elements and their relationships contained within the problem or environment. The greater the number of elements contained in a problem, the greater its complexity. Think of it as a scale ranging from simple to complex. For example, a 100 piece jigsaw puzzle can be relatively simple while a 1000 piece puzzle is more complex. While problem complexity deals

¹ <http://www.americanincite.com/napoleons-corporal/>

² HQ Dept of the Army, FM 5-0, The Operations Process, March 2010, Washington DC, p. 3-1.

³ Dr Richard Paul and Dr. Linda Elder, The Miniature Guide to Critical Thinking, The Foundation for Critical Thinking, 2005, Dillon Beach, CA. p. 1.

with the number of factors, elements and relationships, problem structure deals with the number of possible issues and solutions. A jigsaw puzzle has one solution and everyone agrees whether or not the puzzle was put together correctly. The puzzle is a “well structured” problem. An ill-structured problem can have a multitude of causes or solutions and even “experts” will disagree on the merits of any identified solution. For example, so-called experts on Haiti will not all agree to what is preventing social, economic and political progress in Haiti or on a solution. Haiti is a complex ill-structured problem.

Design’s purpose and the Role of the Commander

The purpose of Design is, “to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them.”⁴ Understanding, visualizing and describing are three of the six parts of Battle Command. (The others are, direct, assess and lead.⁵) Battle Command is shorthand for a commander’s mental process for gaining situational understanding, visualizing possible solutions, describing their understanding and potential solutions to others, and lastly directing actions. Design is simply a technique to apply critical and creative thinking to the Battle Command process. Design is a method for doing Battle Command, not staff work.

Battle Command is the responsibility of commanders, not staffs. The staff’s role in Battle Command is only to assist the commander. The Army’s intent is that commanders be directly involved in Design since Design is a tool for commanders to more effectively fulfill their Battle Command responsibility. FM 5-0 says Commander’s are the “central figure in design”⁶. It could not be clearer. Offer and accept no excuses for commanders stepping out of Design. If the commander is not involved in Design, then they have abrogated their command responsibility to others.

When to use Design and its relationship with decision making processes

Design is essentially a problem understanding or identification process that is meant for complex ill-structured problems. How do you know if you have a complex ill-structured problem? If you don’t understand the issue and its underlying problem; the cause of the problem is not readily apparent and solutions are not obvious; you are probably dealing with an ill-structured problem and Design may be relevant. More put simply, when in doubt use Design.

Understand that the Military Decision Making Process (MDMP) and the Joint Operations Planning Process (JOPP) are problem solving processes that work best with clear or easily identified problems. But if the problem is complex and ill-structured Design will help identify and clarify the problem.

Design therefore fills a gap. Design (problem identification for ill-structured problems) plus MDMP/JOPP (problem solving) should produce more effective actions to address the “underlying problems” rather than just “symptoms”. Design compliments MDMP and JOPP, it does not replace or compete with them. Or as General Dempsey, TRADOC Commander said, “We’ve concluded that the MDMP provides the commander the tools necessary to Decide, Direct, and Assess but not the tools to Understand and Visualize.”⁷ Design fills that gap.

⁴ FM 5-0, p. 3-1.

⁵ *ibid*, p. 1-10, 1-11.

⁶ *ibid*, p. 3-6.

⁷ General Dempsey speaking at the Kermit Roosevelt Lecture, Ministry of Defense, London , England 21 May 2010

Another way of thinking about Design is as a tool for conceptual planning, while MDMP and JOPP are tools for detailed planning. Conceptual planning is broad and answers “what” type questions. What is the situation? What are the issues/problems? What is the goal or end-state? What actions should be taken? Detailed planning is specific and answers “how” type questions. How do we execute? How is synchronization and coordination facilitated? How is the action supported? Generally conceptual planning precedes and informs detailed planning.

Design has nothing to do with echelons or levels of war. So do not think of Design’s applicability in terms of platoons, corps, or the White House or relate Design to tactical, operational or strategic levels. Design is about the degree of a problem’s complexity and structure. If you are a platoon trying to figure out why children in the village won’t go to school use Design. If you are the brigade trying to figure out why children in the district won’t go to school use Design. If you are the corps trying to figure out why children in the province won’t go to school use Design. Design applies regardless of echelon when you are dealing with complex ill-structured problems. On the other hand if you are a platoon, brigade or corps trying to establish a defense, a structured problem, MDMP alone will probably suffice.

Who Does Design?

Since Design is a commander driven process, the commander determines the participants, structure and function of a “Design team.” Doctrine purposely does not prescribe any of this so that a commander can customize the team to suit his or her unique requirements and situation. Typically commanders will build a team that includes trusted people knowledgeable of the problem or situation. Commanders will look for people who can ask relevant questions and then search for answers. Remember we are dealing with ill-structured problems so what one can research may be more important than what one knows. Doctrine does suggest that planners be included on the Design team so that they can provide continuity and linkage between Design concepts and detailed planning

Doing Design

Design is essentially a team thinking about four basic questions and using discourse to answer them, then capturing the results in narrative and graphic form. The four basic questions are:⁸

- What is going on in the environment? (Description of the current state)
- What do we want the environment to look like? (Description of the desired end state)
- What are the tensions in the environment that are preventing achievement of the desired end-state? (What is the problem(s) or obstacle(s) blocking the transition from the current state to the desired state?)
- How do we get from the current state to our desired state? (What actions will address the problem(s)?)

The process of gathering and analyzing the data to answer these questions is called framing. The first two questions describing the environment, how it is and how it should be are the

⁸ Question are derived from HQ Dept of the Army, FM 5-0, The Operations Process, March 2010, Washington DC, p. 3-8, - 3-11 and LTC Celestino Perez, US Army, Command and General Staff College

environmental frame. The third question is the problem frame and the fourth question is the operational approach.⁹

Environment Frame

In framing the environment the team describes both the current state and the desired state. This is where understanding begins. Environmental framing is a holistic look that considers as many factors as possible. Standard staff planning products such as estimates, intelligence preparation of the operating environment, Joint intelligence preparation of the operational environment, a description of the political, military, economic, social, informational and infrastructure systems (PMESII) studies, reports and histories all contribute to describing and understanding the environment. Policy statements, higher headquarters orders and directives, or any form of guidance and intent usually contain descriptions of the desired end-state.

Techniques

One way to understand the environment is to attempt to draw it. The mere act of mapping or illustrating the environment will produce new insights and perspectives while improving understanding. A technique to illustrate or textually describe the environment is to explain the relationships between relevant actors, their functions and tensions. The acronym RAFT, Relationships, Actors, Functions and Tensions is a way to remember this. Another way is to use PMESII as a framework for looking at the environment. These are not doctrine but rather ways to start thinking about framing the environment.

When looking at the environment it should be from each actor's perspective or narrative, not just yours. Ask and record how does the actor view history, culture, entitlements, and fairness. What are his values, interests and grievances? How does each actor view relationships, and functions? What does the actor see as tensions? Answers to these questions help your understanding of the behaviors and motivations of the actors.

The method illustrated in figures one, and two are RAFT maps.¹⁰ They are perhaps the most commonly used method. Planners simply identify the actors then map the relationships, functions and what relationships are in tension. An advantage of RAFT map is that it is unconstrained by any particular format and can be tailored to the specific environment. Figure three (PMESSI Matrix)¹¹, and figure four (PMESSI & RAFT) are fill in the block matrices. While more constrained than the RAFT map, they do add structure which may be useful to less experienced staffs. Some use the matrices to organize facts and assumptions before constructing RAFT maps. These examples would normally be complimented by narrative descriptions. These are not the only methods, any technique, graphical or narrative that conveys environmental understanding is acceptable.

⁹ FM 5-0, p. 3-7.

¹⁰ US Army Command and General Staff College, Core Lesson C403, 2010.

¹¹ Provided by Dr. Carl Fischer, Senior Military Analyst, S3 Systems Studies & Simulations, Inc

Framing the Environment: Observed System

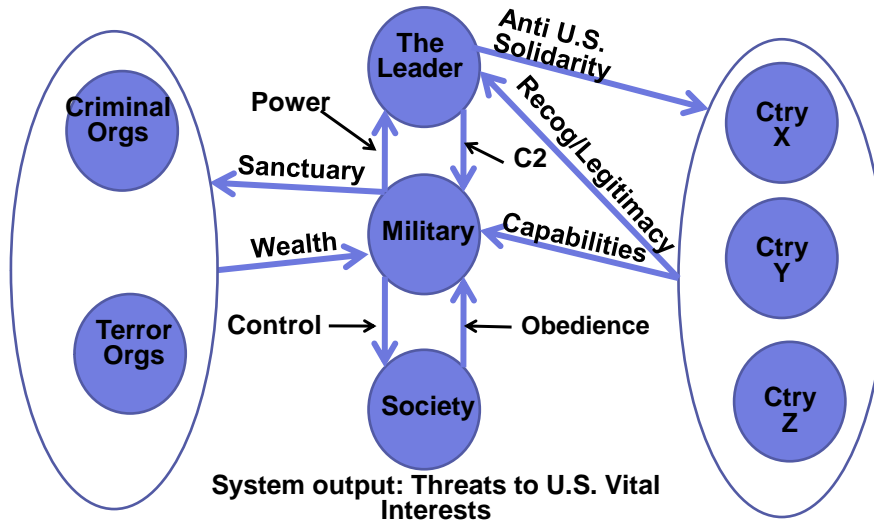


Fig 1. (RAFT Current)

Framing the Environment: Desired System

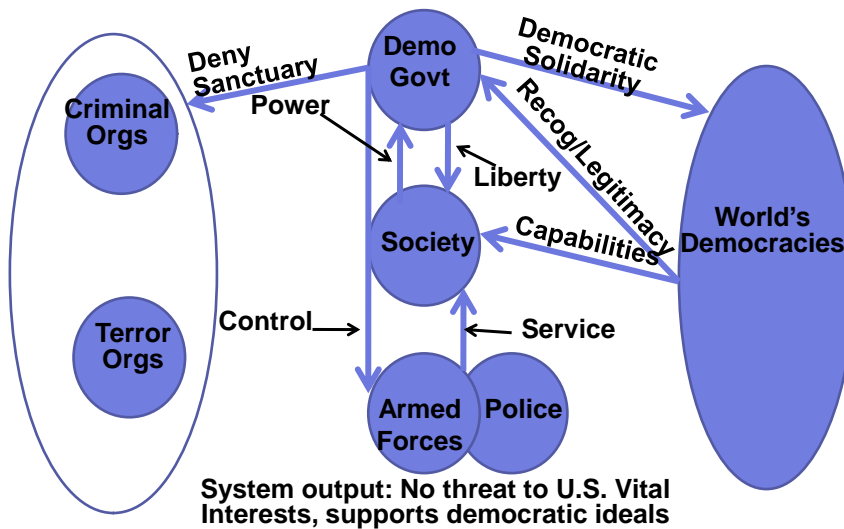


Fig 2 (RAFT Desired)

Design Framework							
	Environment Frame			Problem Frame			
	History (Facts)	Current Conditions (Facts)	Actors, Tendencies & Potentials (Analysis)	Tensions, Risks & Resources (Analysis)	Problem Statements (Synthesis)	Operational Approach (Actions)	Desired Outcomes (Directed or Implied)
P							
M							
E							
S							
I							
I							

Fig 3 (PMESII Matrix)

Environmental Frame				
	Actors	Relationships	Functions	Tensions
P				
M				
E				
S				
I				
I				

Fig 4 (PMESSI & RAFT)

Problem Frame.

While understanding the environment is critical, the goal of design is the identification of the underlying problem. Problem framing is the term for the problem identification process and also contributes to Battle Command's understanding. Problem framing is where the team asks, what in the current environment is preventing change to the desired environment. This is where the team, through discourse strives to identify the underlying causes or root problems, not just the symptoms, that obstruct movement to the desired end state. This is not easily done and requires careful and critical thought. Failure to identify the right problem results in treating the symptoms not the disease.

Techniques

A way to analyze the information from the environmental frame is to use the "Elements of Thought"¹² as a framework for the discourse to determine the root problem/problem set.

Elements of Thought

Purpose. State the purpose clearly. Distinguish it from related purposes. Periodically check to see if you are on target. Choose a realistic purpose. (i.e. To identify the root cause.)

Question at issue. Clearly and precisely state the question at issue. Express the question in several ways to clarify its meaning and scope. Break the question in sub-questions. Determine if the question has one right answer, is a matter of opinion, or requires reasoning from other view points. (i.e. What is the problem or is X the root problem.)

Assumptions. Clearly identify your assumptions and determine if they are justified. Consider how your assumptions shape your view point. (List what you know and assume and then challenge their validity. How does your perspective or bias affect your assumptions?)

Point of View. Identify your point of view. Seek other points of view and identify strengths and weaknesses. Try to be fair-minded in evaluating points of view. (Know your bias and perspective and seek out others with another or even contrarian view.)

Data, Information and Evidence. Restrict claims to those supported by the data. Search for information that opposes your position as well as information that does. Use information that is clear, accurate and relevant. (Evidence backed up by facts or authoritative analysis, avoid emotional arguments. Challenge or test everything.)

Concepts and Ideas. Identify key ideas and explain them clearly. Consider alternative concepts. Ensure you are using concepts and ideas with care and precision. (Accuracy and clarity improve understanding be careful not to obfuscate.)

Inferences, Interpretations and Conclusions. Infer only what the evidence implies. Check inferences for consistency. Identify assumptions that lead to inferences. (Does the evidence logically support your conclusion? Have others check your conclusion.)

Implications and Consequences. Consider all possible consequences. Search for negative as well as positive implications. Trace the implications and consequences that follow from your reasoning. (Are there second or third order affects. What have we not considered?)

¹² Dr Richard Paul and Dr. Linda Elder, *The Miniature Guide to Critical Thinking*, The Foundation for Critical Thinking, 2005, Dillon beach, CA. p. 3.

Using these eight elements should help guide the discourse for the problem frame and development of a problem statement. Other questions to consider are:

- What needs to change?
- What doesn't need to change?
- What are the strengths and weaknesses of the actors?
- What are the opportunities and threats?
- What conditions need to exist for success?

The product of this “problem discourse” is a problem statement. According to FM 5-0 the problem statement, “... clearly defines the problem or problem set to solve.”¹³ However, it also goes on to include the phrase, “...how to transform the current conditions...” This reflects an ongoing and unresolved debated in Design as to whether a problem statement is a “How to” or a “The problem is” statement (Interrogative or Declarative). I support the, declarative “The problem is...” type of statement simply because it clearly defines the problem and states it upfront. The issue with the, interrogative “how to” statement is that it can lead to prematurely jumping to solutions or courses of action without clearly defining the problem. This can reinforce treating symptoms rather than root causes. The interrogative “how to” is better used as a lead question when looking for solutions in Design’s Operational Approach step. Again conceptual planning, which Design is, is better suited for answering “what is” type questions while detailed planning is best suited to the “how to” questions.

Below is an example of a “what is” or declarative problem statement and a “how to” or interrogative statement. The Design team can decide which type of statement best suits their organization

The lack of a government capable of exercising sovereign control in Somalia, allows piracy off the Somali coast to flourish and threatens the USG’s long term aims and stability in East Africa?

How does JTF-N support US/MEX elements of national power to strengthen partnership capacity against transnational crime while enabling a sovereign, stable, and secure Mexico?¹⁴

Once you know what the problem or underlying cause is you can start to figure out a solution.

Operational Approach

Operational Approach is FM 5-0’s label for the solution or answer to the question, what action(s) do we take to address the problem(s) identified in the problem frame. Basically the operational approach is the action(s) that will produce the conditions that achieve the end state.¹⁵ The Operational Approach lays out what to do, not how to do it. In this sense it is more like, although not exactly, a mission rather than a course of action. This is an important distinction to make and Design team members need to keep it in mind. Again Design is conceptual planning (what) not detailed planning (how).

Techniques

Broadly speaking Operational Approaches fall into one of three categories; remove, provide, and change (RPC). If the transition from the current to the desired state is blocked by

¹³ FM 5-0, p. 3-11.

¹⁴ Student Design product from the US Army Command and General Staff College’s Design elective course A559, AY 10-1.

¹⁵ FM 5-0, p. 3-11.

something that is not needed in the desired state then removal is an approach. If transition is prevented by the absence of a requirement, then an approach is to provide. If the problem is a behavior or a condition of a requirement, or something that cannot be removed then change is an approach. Again these three are categories of approaches, actual approaches will be more specific and the lists of approaches are only limited by ability to think creatively, but RPC provides a start point.

The categories of Operational Approaches can also be used in combination for a multi-faceted approach to the problem set. For example active law enforcement is an approach to removing crime. Educational or economic programs are meant to provide options other than criminal activity. Finally locking doors, securing property and judicial actions are approaches to changing behavior that reduces crime. In this example each of these separate approaches when combined can be considered as lines of Effort (LOE).

Note that in the example the Operational Approaches (active law enforcement, educational and economic opportunities and securing property etc.) sound more like missions than courses of action. They are what to do, not how to do it.

Design Concept

Up to this point the Environmental and Problem Frames and the Operational Approach helped the commander to understand and visualize. It is in the Design Concept where the commander fulfills his Battle Command responsibility to describe.

The Design Concept is the resulting product that feeds detailed planning in the MDMP or JOPP. It bridges the gap between the commander's conceptual understanding and visualization and the staff's detailed planning.¹⁶ There are five basic products in the Design Concept.

First are the unspecified references that described both the current state and the desired state. These references can be just about anything including estimates, studies, reports, diagrams, directives from higher etc and can be textual or graphic. While not necessarily included in formal orders or even passed on to subordinates these products should be kept on hand by the Design team for future use and reference.

Next is the problem statement which is a clear concise statement of the commander's understanding of the problem and what must be acted upon. This can be passed on to the planners as a stand-alone product or included in the commander's initial intent.

The commander's initial intent is where the commander describes his understanding, visualization and operational approach to subordinates. Note that this is only an initial intent statement; it will be further refined by the staff during mission analysis in the MDMP or JOPP.

The commander's initial planning guidance is also informed by Design and contains any planning guidance the commander deems appropriate to guide staff actions and planning.

The last product of the Design Concept is the Mission narrative. This is a new product that is directed at internal and external audiences. The easiest way to think about mission narrative is to imagine what a commander would say to while standing in front of the media explaining the situation, mission and purpose. The Mission narrative is an unclassified script that explains to internal military audiences the commander's visualization that forms the basis

¹⁶ *ibid*, p. 3-12.

for the concept of operations.¹⁷ At the same time it is meant to inform, and influence external stakeholders that are part of the operating environment as to what the purpose and goals of the mission are.¹⁸

Reframing

Reframing is simply the recognition that things are always changing and nothing is static. It is like driving a car where you are continually making adjustments based on observation of conditions and unexpected opportunities. You may have planned to drive from point A to point B but along the way you decide to change routes or even destinations. Reframing is not a separate step; it is embedded throughout the Design methodology and can occur anytime thus allowing the commander and staff to make adjustments at any point throughout the operations process.

Reframing generally has three triggers; a catastrophic change in the environment, a planned periodic review, or the understanding changes based on reflection or assessment of the existing problem and operational approach. Reframing restarts the entire Design process, not just a specific step.

Techniques

Reframing can be thought of as a series of questions that can be asked at any point including during execution.

- What changed?
- Do I have the right information? What am I missing?
- How does the Design team's bias or perspective affect the product?
- Are my facts, assumptions hypothesis still valid or correct?
- Is the analysis correct? Does it need to change based on new information?
- Are we attacking the root problem or a symptom?
- What actions will produce the effects necessary to change behavior or conditions? (End State)
- Are the actions shaving the intended effect? (Measures of Effectiveness)
- What are possible outcomes or unintended consequences?

These are just examples of the types of questions that should be continually asked throughout Design and execution. (Assess in Battle Command.) The point is to always to ask questions and be open minded to the need to change.

Communicating Design

To create a bridge from Design's conceptual work to detailed planning the Design team must clearly and concisely explain their results to planners and others unfamiliar the teams work.¹⁹ Reliance on the Design products alone will generally be insufficient and some form a

¹⁷ *ibid*, p. 3-12.

¹⁸ *ibid*, p. 3-12.

¹⁹ School of Advanced Military Studies, *Art of Design: student Text 2.0*, May 2010, fort Leavenworth , KS, p. 183

Design brief will be required. The School of Advanced Military Studies recommends a storyboard type approach this contains the following points.²⁰

- Identify the problem or situation that requires Design.
- Define the observed and desired systems.
- Define the limits of the study by identifying the relevant actors within the systems. This bounds the system.
- Explain the relationships, functions and tensions between the actors. The potential to shape an actor's behavior. The difference between the observed and the desired system.
- Identify the areas or potentials that can affect the system and actions that will shape the design concept.

The Design team should approach their brief from the perspective of an audience that has no knowledge of the work done. This will require discussion and deliberate planning among the Design team. The team should strive to avoid telling the audience how insightful and brilliant the team was. The team would do well to remember the KISS (keep it simple stupid) principle, and the saying, "just the facts Ma'am"

Conclusion

Because Design is largely focused on conceptual planning and will vary from one commander and staff to another based on circumstances, the techniques offered here are only suggestions. People think and analyze differently so there are other techniques. However, the techniques in this article can serve as start points or considerations for the conceptualization process. At a minimum they will put a framework on what otherwise could be an intimidating blank sheet and answer the question, "***Where and how do we start?***"

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²⁰ School of Advanced Military Studies, Art of Design: student Text 2.0, May 2010, fort Leavenworth , KS, p. 183