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FOR DOCTRINE DEVELOPMENT AND EDUCATION



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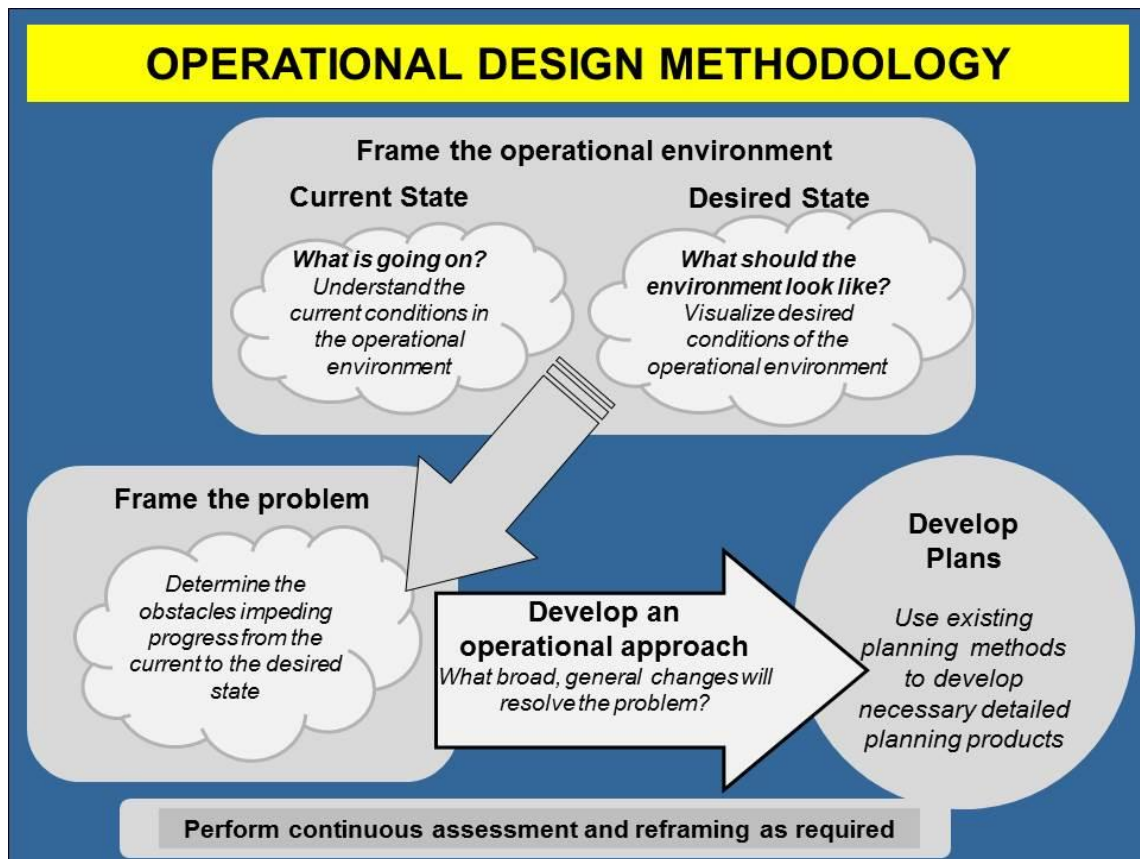
METHODS OF OPERATIONAL DESIGN

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Operational design is the first level of strategy implementation and rests upon operational art, which is defined as the “cognitive approach by commanders and staffs—supported by their skill, knowledge, experience, creativity, and judgment—to develop strategies, campaigns, and operations to organize and employ military forces by integrating ends, ways, and means” (Joint Publication [JP] 5-0, Joint Planning). Operational art uses the commander’s vision and intent to determine broadly what should be accomplished in the operational environment; it is guided by the “why” from the strategic level and implemented with the “how” at the tactical level. In applying operational art, the commander draws on judgment, perception, creativity, experience, education, intelligence, boldness, and character to visualize the conditions necessary for success before committing forces. This visualization is captured in the commander’s operational approach, which is a description of the broad actions the force must take to transform current conditions into those desired at the end state (JP 5-0, *Joint Operation Planning*).

OPERATIONAL DESIGN METHODOLOGY

Design provides an ordered way to create the conceptual framework of a plan. Strategists and planners can then use the joint planning process (JPP) to create detailed subordinate plans and orders. The purpose of design is to create an operational approach that can be “fleshed” into more detailed plans. In order to derive the operational approach, the commander and staff should understand the operational environment and the problems the joint force commander (JFC) has been given to solve. Thus, broadly speaking, operational design consists of *framing (or understanding) the operational environment, framing (or defining) the problem, and developing the operational approach*. See the figure, “Operational Design Methodology,” for a general overview.



Operational Design Methodology

Framing the Operational Environment

Operational design begins with framing the operational environment (OE)—establishing the larger context of a situation within which the commander should act in order to realize the operation’s aims. This entails reviewing all existing guidance from higher authorities (including existing theater campaign and country plans that govern steady-state activities) and examining all actors (opponents, friends, and neutrals) and their relationships within the OE. The aim is to understand existing conditions in order to derive the set of conditions we wish to see at the end of operations (often the restoration of stable steady-state conditions), as well as understanding the competing conditions that other actors would like to see. Based on overarching guidance, the JFC will derive that portion of the end state the military is responsible for delivering (the military end state) and assign the military objectives required to arrive at that end state. These objectives form the basis for the operational approach.

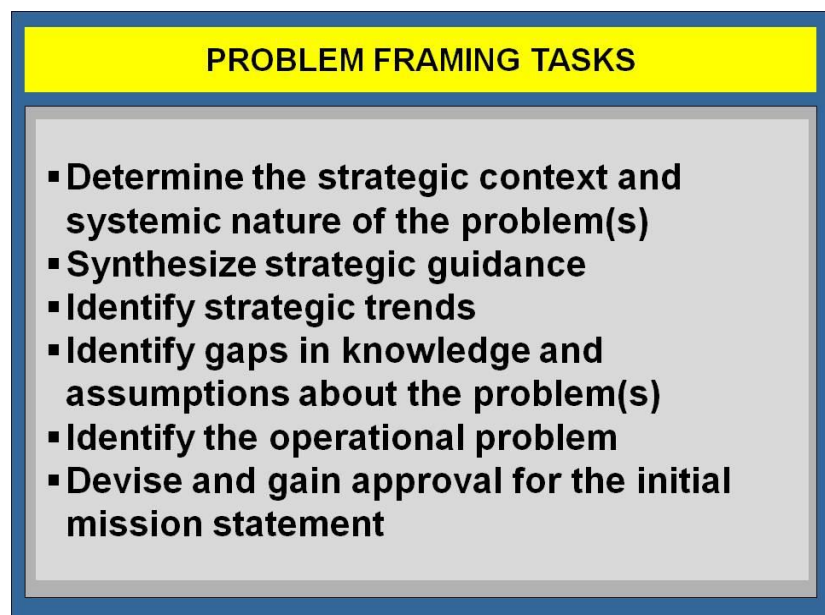
The principal means by which the commander and staff gain understanding of the OE is joint intelligence preparation of the operational environment (JIPOE). Guidance concerning JIPOE can be found in JP 2-01.3, *JIPOE* and [JP 5-0, Chapter IV](#).

Framing the Problem

This part of the process entails reviewing the tendencies and potential actions of all actors within the relevant OE and coming to an understanding of the root causes of the issue at hand. This is not the same as problem solving, which planners do at lower levels to create solutions to medium- and well-structured problems within the conceptual

framework created by the commander and strategists. Problem framing entails determining the overall boundaries and aims of the operation, much as an architect does for a building project. In many cases, only the most prominent tendencies and potential actions of all the actors in a situation can be considered in a finite time by a well-informed staff. In-depth understanding may require a lifetime of study and immersion and the military must often go outside its own channels—to the interagency community, regional experts, academics, and local nationals—to leverage such knowledge. When possible, open, collegial dialogue among the commander, “sponsors,” other government agencies, and nongovernmental organizations, staff strategists, and planners can be very beneficial during this process. As operational design progresses into planning, the process becomes more formalized and the models strategists and planners work with become more empirical as they engage in course of action (COA) development, analysis, and wargaming. Operational design, however, focuses upon providing basic, overarching structure to the problems that planners may have to solve “further down the road.” The “collegial dialogue” should help establish the basic context of the problem to be solved and the logical relations between its elements.

Several tasks help provide structure to the problem framing efforts of the commander and planning staff and make it easier to break ill-structured problems into smaller “chunks” of medium- to well-structured problems. These tasks are depicted in the figure, “Problem Framing Tasks,” and consist of the following:



Problem Framing Tasks

★ **Determine the strategic context and systemic nature of the problem(s)**—

Examine the reasons the problem came to exist, its history, and how it may develop. Examination should include analysis of all actors—friendly, adversary, and neutral—and encompass all instruments of power, as well as unique aspects of the operational environment that may play a role (like distinctive terrain, climate, and cultural aspects).

★ **Synthesize strategic guidance**—Determine what guidance from national leadership, the [combatant commander](#), etc., already exists concerning the desired strategic end state. In some cases, guidance from national leaders will not be logically coherent and military commanders, including the [joint force air component commander](#) (JFACC) and the commander, Air Force forces (COMAFFOR), may need to help clarify such guidance, as was the case during the “design phase” leading up to Operation DESERT STORM). Answer questions like, “are vital national or [multinational](#) interests at stake?” “Are the strategic aims consistent with previously established policy and strategy?” etc. Attempt to create clear *boundaries* to the problem and a coherent, logical end state that represents continuing strategic advantage.

- ★ **Identify strategic trends**—Describe how the strategic situation is expected to evolve over time—what trends yield outcomes favorable and unfavorable to friendly interests? What can be done to arrest or encourage trending? This effort should begin to suggest broad COAs. If systems are transformed, what behaviors might emerge?
- ★ **Identify gaps in knowledge and assumptions about the problem(s)**—Speculation on COAs and system-wide effects should suggest gaps in knowledge and provide the basis for later determination of [commander's critical information requirements](#) (CCIRs). CCIRs include [priority intelligence requirements](#),¹ [friendly force information requirements](#),² and, in many cases, host nation information. Gaps in knowledge also suggest key assumptions that need to be made about the problem(s) to provide a coherent framework for design and for the JFACC's and/or COMAFFOR's decision-making. Assumptions can encompass political factors, adversary behavior, forces required, time limits, etc. This is a critical step in the design process. Assumptions endow a design with focus, as well as the ability to identify the greatest risks to an operation. For example, Allied operations analysts and air planners during World War II assumed (correctly) that ball bearings were an essential industrial bottleneck for the Axis war economy. However, they incorrectly assumed the Germans neither recognized this weakness nor prepared to counter the effects of Allied attacks. Ultimately, Allied bombers did succeed in heavily damaging German ball bearing factories, but their efforts—attained at a huge cost in Allied lives and aircraft—did not significantly impede the Axis war effort.
- ★ **Identify the operational problem(s)**—Thinking through the steps above should give commanders and staffs enough information to identify the problem's critical factors, along with the problem's logical boundaries and a framework for viewing the critical factors. This should entail assessing the desired strategic end state from higher leadership's guidance (or, in some cases, synthesizing and recommending it, where none has been explicitly established). Commanders and strategists then use that assessment to develop the military end state and termination criteria. Correct identification of the operational problem, its boundaries, and key assumptions also helps guide selection of broad indicators and measures of success. These help focus [intelligence, surveillance, and reconnaissance](#) operations and help further determine CCIRs.

Developing the Operational Approach

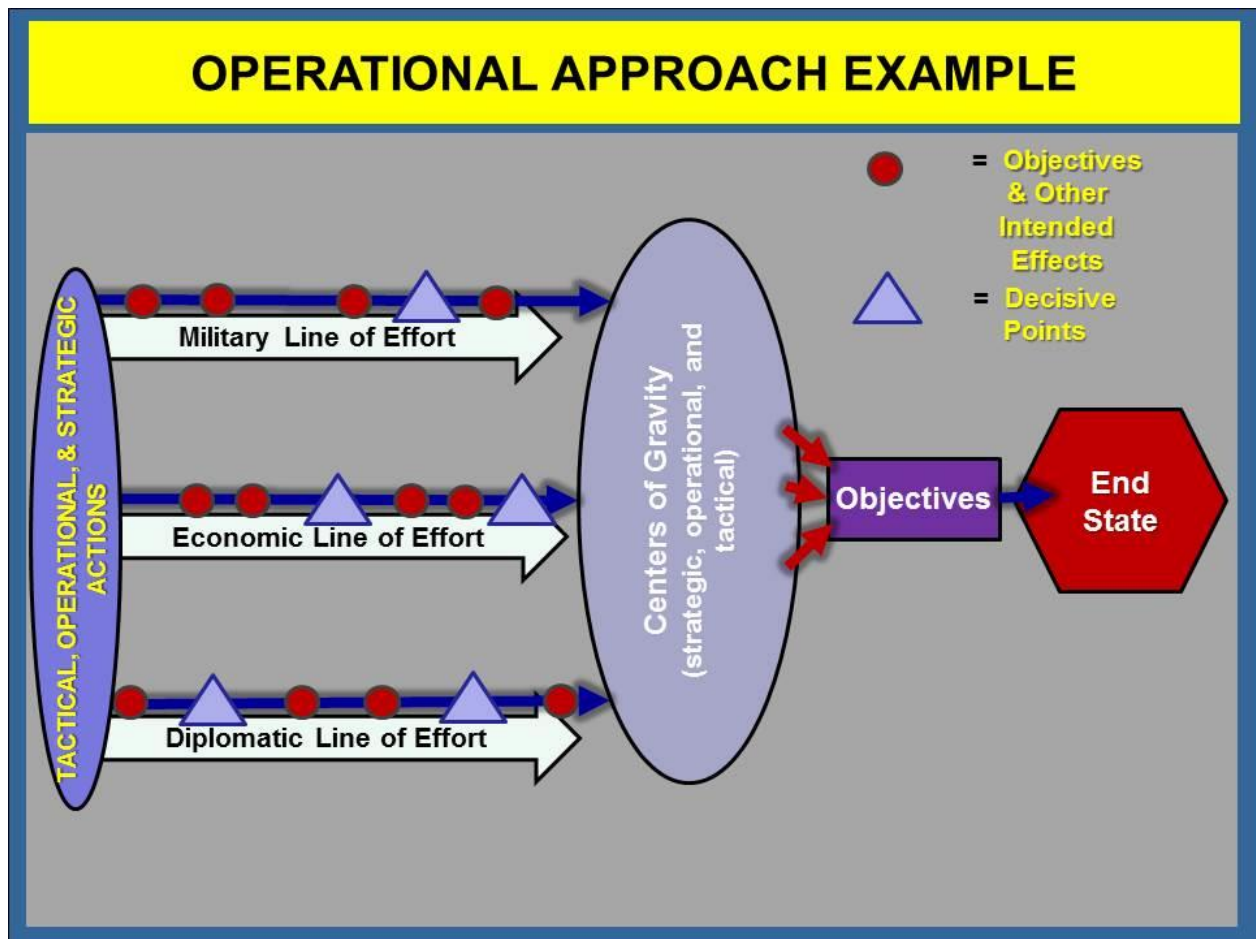
The operational approach describes in broad terms how the OE should be changed from existing conditions to desired conditions. It is a commander's means to describe what the joint force must do to achieve objectives that bring about the desired end state. Frame the mission with a clear, concise statement of the purpose to be achieved and the essential tasks to be accomplished—who, what, when, where, and why. It may be helpful to both conceive and present the operational approach graphically, as well as in words, as shown in the figure, “Operational Approach Example.”³

¹ Intelligence requirements, stated as priorities for intelligence support, that the commander and staff need to understand the adversary or other aspects of the operational environment. (JP 2-01, [Joint and National Support to Military Operations](#).)

² Information the commander and staff need to understand the status of friendly force and supporting capabilities. ([JP 3-0](#))

³ Figure adapted from Jeffrey M. Reilly, *Operational Design: Distilling Clarity for Decisive Action*.

The figure, “Operational Approach Example,” depicts a summary “cognitive map” of the alignment of operational design’s key elements. It depicts how actions at the tactical level lead to effects, which can be usefully depicted using [lines of effort](#) (LOEs).⁴ LOEs lay out critical desired effects, decisive points (DPs), and other events along a timeline that relates these to COGs, commander’s objectives, and the operation’s end state in a manner that shows relationships between all the elements, but is easy to comprehend. Creating desired effects should lead to correct decisions at DPs, which are specific places, key events, critical factors, or functions that, when acted upon, allow commanders to gain a marked advantage over an adversary or contribute materially to achieving success.⁵ Achievement of these along an entire LOE allows friendly operations to decisively affect COGs, which are sources of power that provide all actors within the operational environment (adversary, friendly, and neutral) with physical strength, freedom of action, or the will to act.⁶



Operational Approach Example

Decisively affecting COGs leads to achievement of friendly objectives. When all objectives are achieved, by definition,⁷ the end state should also have been achieved.

⁴ In some joint planning literature and Marine Service doctrine, LOEs are still referred to as “lines of operation” or “logical lines of operation.” Joint doctrine, however, now recognizes the distinction between lines of operation and LOEs and uses the latter in [JP 5-0](#).

⁵ [JP 5-0](#).

⁶ Ibid.

⁷ Joint doctrine defines the end state as “the set of required conditions that defines achievement of the commander's objectives” ([JP 3-0](#)). The Air Force definition further refines and illustrates the concept, but the joint definition is most applicable here.

Note that operations take place in the order described above. They are designed and planned, however, in the opposite “direction”—starting with the strategic and military end states as a product of operational design and “concluding” with detailed planning for tactical actions (along with assessment of those actions and all intermediate steps, performed by analysts, planners, strategists, and commanders at all levels).

The statement of commander’s intent should explicitly express the military end state and how it fits into the larger context of the national and international strategic end state. Finally, these statements should be explained to and approved by national leadership or other relevant higher commanders.
