

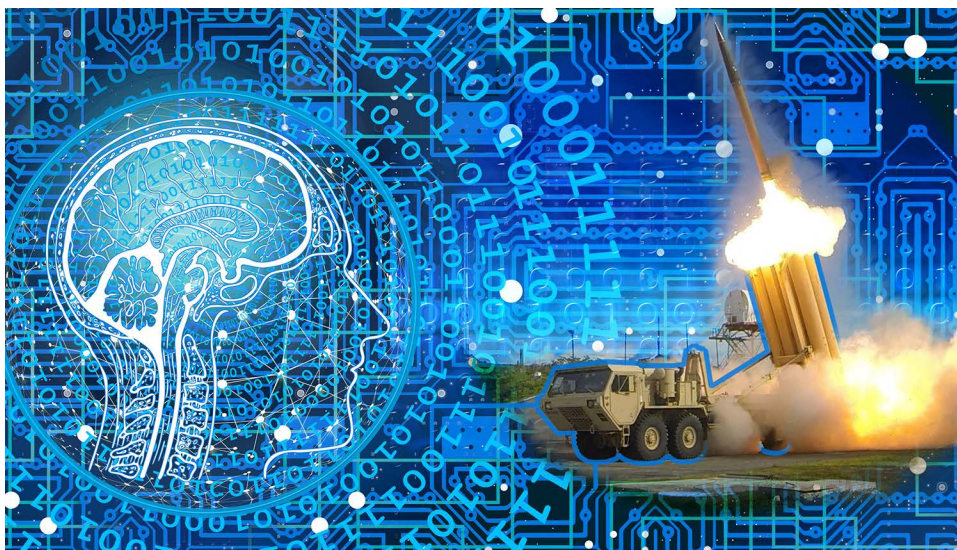
More Cowbell: A Case Study in System Dynamics for Information Operations

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To put it simply, we need to worry a lot less about how to communicate our actions and much more about what our actions communicate.

—Former Chairman, Joint Chiefs of Staff
Adm Michael G. Mullen,
August 2009



Introduction

In a popular “Saturday Night Live” skit from 2000, despite the cowbell depicted as an afterthought in a fully integrated band, the audience learns a valuable lesson on the importance of “more cowbell.”¹ To continue the metaphor, the cowbell has never been and will never be the primary line of effort in the band. But the cowbell permeates throughout the music, often tying the entire performance together. Such is the fate of information operations in a joint environment, often consid-

ered a “second-class citizen as a source of nonlethal effects, an afterthought bolt-on to fires, or worse.”² On the contrary, information operations is often the capability that binds joint operations together to make it successful.

Ultimately, how surrogates of the US government engage and communicate with foreign audiences matters, and the success or failure of most foreign policy decisions is “contingent on the support received from various populations whose perceptions are influenced by both what we do and what we say.”³ This fact is especially relevant, considering American public diplomacy often “wears combat boots.”⁴ That is, when the military element of national power is used to convey or conduct foreign policy, the support and perceptions of target populations become instrumental to mission success.

Often, military objectives depend in large part on the behavior and attitudes of relevant civilian populations and cannot be achieved solely through the application of force.⁵ Even the *Department of Defense Strategic Communication Science and Technology Plan* noted that “a compelling argument can be made today that the public perceptions and implications of military operations might increasingly outweigh the tangible benefits actually achieved from real combat on the battlefield.”⁶ “Every action, utterance, message, image, and movement of a nation’s military forces influences the perceptions and opinions of the populations who witness them—both first hand in the area of operations and second or third hand elsewhere in the world.”⁷ Quite simply, “Every action that the United States Government takes sends a message.”⁸ Therefore, this “battle of the narrative” should be understood as “a full-blown battle in the cognitive dimension of the information environment, just as traditional warfare is fought in the physical domains (air, land, sea, space, and cyberspace).”⁹ Once recognized as an integral part of a military campaign, strategic communication should be accounted for in the Joint Planning Process.

A recent example of such a foreign policy decision serves as a case study in the ability to account for such factors when weighing particular courses of action (COA). In July 2016, a course of action was implemented to introduce the Terminal High Altitude Area Defense (THAAD) missile defense system to the Korean peninsula, with deployment occurring throughout the first half of 2017. Although not yet fully operational, the deployment of THAAD will likely achieve several tactical objectives defending the Republic of Korea (ROK—South Korea) from ballistic missile attacks from the Democratic People’s Republic of Korea (DPRK—North Korea). In taking this action, however, numerous second- and third-order effects were created, each with their challenges. Such challenges must be overcome to achieve national strategic objectives.

The following analysis deconstructs joint doctrine provided to the information operations planner for synchronizing their efforts with the overall Joint Planning

Group. The analysis shows that while doctrine often calls for “more cowbell,” seldom does it explain *how* to incorporate such measures into the overall plan. To develop an integrated, synchronized information operations plan, this analysis suggests a four-step process based on systems analysis to achieve unity of effort; gain synergies throughout the joint planning process; and avoid unintended consequences, information fratricide, and strategic surprise. In the words of Admiral Mullen, “we need to worry . . . about what our actions communicate.” Therefore, in addition to the proposed recommendations, several areas for further research related to joint planning and the integration of information operations into the planning process are also provided.

Background

Information operations (IO). *Information operations* is an umbrella term that covers the “integrated employment, during military operations, of information-related capabilities in concert with other lines of operation, to influence, disrupt, corrupt, or usurp the decision-making of adversaries and potential adversaries, while protecting [the United States].”¹⁰ This information environment, therefore, is comprised of three main dimensions: the physical, informational, and cognitive dimensions.¹¹ As an umbrella term, information operations covers a wide range of military activities intended to affect each of these dimensions. For example, aspects of information operations include electronic warfare aimed at physical infrastructure, cyber attacks levied against adversary information stores, and strategic communications intended to alter the cognitive foundation of a target audience, usually with the intent of influencing the target audience’s behavior—either through coercion or deterrence. This cognitive dimension of the information environment encompasses the mind of the decision maker and the target audience. In this cognitive dimension, the target audience thinks, perceives, visualizes, and decides on potential courses of action. “Public opinion, perceptions, media, public information, and rumors influence the cognitive dimension, and . . . ‘the battle of the narrative’ [is] won or lost here.”¹² In today’s highly interdependent and globalized world, information provides perspective and helps senior decision makers understand an increasingly complex operating environment, such as the one currently found on the Korean peninsula.

THAAD. THAAD is a ballistic missile defense system with the capability of intercepting and destroying ballistic missiles during their final, or terminal, phase of flight.¹³ Each THAAD system consists of a highly mobile truck-mounted launcher, eight interceptor missiles, tracking radar, and a fire-control computer. According to a joint statement between the US and ROK, the purpose of THAAD is to act as a “defensive measure to ensure the security of South Korea and its

people, and to protect Alliance military forces from North Korea's weapons of mass destruction and ballistic missile threats."¹⁴

The stated intent of deploying THAAD to ROK is to prevent Pyongyang from being able to engage in coercive diplomacy. However, because THAAD destroys missiles during the terminal phase regardless of where they originate, placing the system in ROK means that China is similarly limited in its ability to use such coercive diplomacy. That is, by placing THAAD in ROK, China is just as constrained as DPRK in its ability to use coercive diplomacy, regardless of American assurances of the defensive nature of THAAD. Such discussions between the United States and China over the offensive or defensive nature of THAAD can only occur, however, when mutual trust exists between the relevant parties.¹⁵ Such trust does not currently exist between the US and China, although targeted information operations could help alleviate this discrepancy.

Since China has never been in favor of such a deployment, the deployment of THAAD to the peninsula indicates a South Korean willingness for closer relations with the United States, though at the expense of a closer relationship with China. When analyzed against an advancing North Korean nuclear threat, the US, ROK, and Japan all believe that THAAD will aid in increasing stability for the region. On the other hand, China has a legitimate concern about having its nuclear deterrent compromised by THAAD, and the United States certainly desires strategic stability with China. Similarly, the US has a legitimate desire to defend against North Korean missiles that can reach Japanese, and South Korean targets and one day soon, the US west coast. North Korea, however, has an equally legitimate objective to strengthen its deterrent in the face of US, Korean, Japanese, and now Chinese pressures. Such competing national interests increase cognitive and physical tensions in an already tense region of the world.

Additionally, pockets of South Korean citizens have publicly protested the deployment, concerned about potential provocations of North Korea and environmental concerns at the deployment location.¹⁶ The topic of THAAD has also become a discriminating factor among the major political parties in South Korea and was fiercely debated between the front-runners for ROK's recently vacated presidency.¹⁷

As retribution for moving forward with the deployment of THAAD, China has engaged in activities to shut down major South Korean stores in China, banned the import of South Korean goods, prohibited Chinese tourists from visiting South Korea, and proliferated anti-Korean sentiment.¹⁸ Meanwhile, North Korea continues nuclear tests and engages in increasingly aggressive rhetoric.

Analysis

An analysis of the deployment of THAAD to the Korean peninsula illustrates three areas for improvement for IO doctrine provided to joint force planners in the realm of unintended consequences, information fratricide, and strategic surprise.

Unintended Consequences. During the Joint Planning Process, planners utilize various frameworks to analyze the operational environment, taking into account the political, military, economic, social, infrastructure, and informational (PMESII) factors that may affect potential courses of action. All of these actors, factors, and forces combine to create an exceedingly complex cognitive environment in which strategic communications must operate. Usually conducted as a part of Joint Intelligence Preparation of the Operational Environment development, too often, this is where the analysis ends. Ending the analysis at this point opens the planner up to missing complex interactions between various PMESII nodes. That is, without a more complete picture of the operating environment, potential COAs cannot be adequately analyzed, and second- and third-order effects may be missed. Similarly, since “all actions send a message,” decision makers need the means to relate seemingly disparate actions, to determine what second- and third-order effects there might be. Chinese economic repercussions against the ROK are an example of such unintended consequences. Though these actions may not have been avoidable, planners and decision makers need a way to understand (and plan for) the relationships between seemingly disparate nodes of the operating environment.

To help alleviate this problem, the Joint Interagency Coordination Group (JIACG) should be fully engaged in planning efforts with the Joint Planning Group. The JIACG consists of representatives from throughout the interagency community and would have the added benefit of providing feedback to the JPG on nonmilitary actions, such as those taken by China in response to the deployment of THAAD.

Information Fratricide. When information operations fail to align and synchronize, several challenges can arise. Often, specific IO actions might need to be taken to mitigate the actions of another agency or military headquarters. For example, one of the United States’ largest peninsula exercises, Ulchi Freedom Guardian, has been described as “purely defensive in nature” by both US and ROK leadership.¹⁹ However, the exercise occurs amid statements by the then-Secretary of State that “all military options are on the table,”²⁰ and those by the current US Ambassador to the United Nations Nikki Haley, that the US is “not ruling out anything, and we’re considering every option.”²¹ Such statements increase tensions in the region and could constitute “information fratricide,” where

one element of the government makes a statement that contradicts or undermines messages from elsewhere in the government.²² As such, highly developed techniques must be established to ensure that planners and decision makers can identify those nodes most susceptible to information operations and to ensure that such efforts are integrated and synchronized within the overall operation.

Strategic Surprise. Without appropriate messaging and signaling, friendly courses of action that might seem to be “common sense” can often take allies and adversaries by surprise. When attempting to maintain regional stability in a complex, interdependent operating environment, strategic surprise can cause additional unintended consequences, which makes forecasting adversary actions more difficult. All actions should be unambiguously communicated and should be signaled to the maximum extent possible. Such deliberate and overt signaling allows both adversary and ally alike to forecast the actions of the United States and helps to build trust. Instead, the announcement to deploy THAAD (in July 2016) did not come immediately following a North Korean provocation, nor was it unambiguously signaled. As a result, the announcement surprised many in the region—not necessarily because the decision was made, but because it was made at that particular time.

It is important to note here that there is a marked difference between diplomacy and public diplomacy. That is, while public statements may have illustrated surprise or have intended to convey a certain meaning, private communications between the nations in the region may very well have communicated a different message or served another purpose. While such flexibility in messaging is desirable, it should be noted that any difference in public and private communications simply increases the complexity of the IO operation, and provides the opportunity for mixed messages, information fratricide, and ambiguous intentions. The decision to have conflicting public and private communications should simply be weighed against the intended benefits of such a course of action, and unintended consequences should be planned for.

In complex operating environments such as East Asia, unintended consequences, information fratricide, and strategic surprise are three factors that significantly complicate planning efforts and can lead to catastrophic consequences. These factors can be readily mitigated, however, with a systems approach to information operations.

Systems Approach to Information Operations

According to Joint Publication 5-0, planning for information operations should be conducted in parallel with campaign and contingency planning.²³ Such support efforts are likely to be conducted by the Information Operations Cell (IO

Cell), which is primarily responsible to the joint force commander to integrate informational capabilities into the overall plan. The IO cell also operates in coordination with the rest of the Joint Planning Group, which is synchronized with the prevailing desired objectives. These operational-level planning groups “align and synchronize information-related capabilities to achieve effects beneficial to mission objectives and strategic guidance.”²⁴ This responsibility is no small feat, however, as current doctrine requires members of the IO Cell to conduct such planning, but does not explain *how* to conduct such efforts. The analysis of the deployment of THAAD to the Korean peninsula suggests a four-step process that may prove to address this gap in doctrine, providing IO planners a process for producing an integrated, synchronized information operations plan. It should be noted that this four-step process assists in the execution of several steps currently described in joint doctrine, including the IO Estimate, Center of Gravity Analysis, COA Development, and IO Task Development, with differing levels of detail provided in doctrine for each.

Step 1—Conduct a System Analysis of the Operational Environment

Given the complex, interdependent environment often encountered during campaign and contingency planning, PMESII analyses should be taken one step further, by graphically representing the operational environment by means of systems thinking and a resulting systems map.

Conceptualized by Massachusetts Institute of Technology professor Jay Forrester, systems thinking is essentially the opposite of the traditional analyses taught throughout professional military education. Joint doctrine currently employs “systematic” thinking, which emphasizes separating the individual pieces of what is being studied into manageable parts.²⁵ This emphasis is why PMESII frameworks are so widely utilized throughout military planning. By contrast, systems thinking (or systemic thinking) focuses on the interaction between the various nodes being studied. Instead of breaking the system down into smaller chunks, it expands to include all actors, factors, and forces working upon a system. For this reason, systems thinking is often more effective in solving the most difficult problems—complex issues involving numerous, interdependent variables.²⁶ That is, systems thinking is vital in understanding foreign policy implications like the deployment of THAAD to the Korean peninsula.

For this case study, such a systems analysis might look like figure 1.²⁷ Each actor, factor, or force that provides input to the Korean operational environment is mapped, including each node’s relationship with other nodes in the system.

Meanwhile, all of the nodes and interactions are depicted in relation to the likelihood of development for the best- and worst-case outcomes, which is identified as the denuclearization of the peninsula and World War III, respectively. Red arrows throughout the map indicate an inverse, negative relationship, whereas green arrows indicate a direct, positive relationship between two nodes. Black arrows indicate variable relationships that are actor dependent. For example, on the far left of the systems map, the deployment of THAAD to the peninsula negatively affects the security perceptions of North Korea, while positively influencing the security perceptions of ROK. The systems map also highlights those events that have already occurred, which are annotated by a gold outline. Once all relevant actors, factors, and forces are mapped, planners can more fully analyze the complexity and interdependencies of the operating environment.

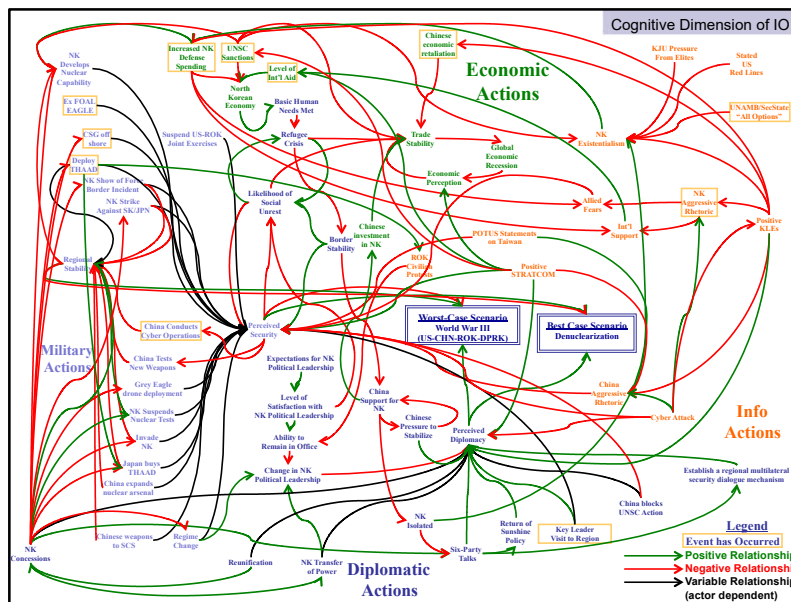


Figure 1. Systems map of North Korean operating environment

Developing such a process map acknowledges that “actions communicate,”²⁸ and that unrelated actions often matter at least as much, if not more, than the actions purposely taken within the realm of a particular course of action. The left-hand side of figure 1 shows how military actions have subsequent effects on seemingly unrelated diplomatic efforts, the so-called “diplomacy of deeds,” as evidenced by the negative tensions introduced by large-scale military exercises such as Foal Eagle and Ulchi Freedom Guardian. While these exercises might be meant as a deterrent, they also have a negative influence on North Korean security perceptions, which hinders the development of our best-case outcome.

Such a representation also allows for the means to coordinate policies, actions, and other sources of messages and signals to achieve desired objectives.²⁹ It also gives a representation for which elements of national power might be used to affect a particular node without necessarily resorting to military action. Such efforts, therefore, create synergistic multipliers for applying other forms of national power.³⁰

When military planners utilize traditional thinking and use PMESII to break down the operational environment, they often overlook how each factor interacts with each other, causing changes in the perception of the target population. Systems mapping specifically eliminates these gaps and ensures these perceptions are not only accounted for but illustrates which nodes affect such perceptions. By specifically visualizing these perceptions, planners can identify which nodes are susceptible to information operations.

The systems map identified in figure 1 suggests several courses of action that might initiate a chain of events leading to our best- and worst-case outcomes. Planning staffs should attempt to capture all of the potential COAs (and their nodal relationships) within the overall systems map. Doing this will necessarily require an iterative process, as current doctrine requires that the operational environment is analyzed before COA development. By iteratively including potential COAs within the systems map, a more thorough COA analysis can be performed in subsequent Joint Planning Process steps.

Step 2—Forecast the Best and Worst-Case Scenario Within the Systems Map

Once the systems map has been developed and includes several potential courses of action, planners should forecast the best- and worst-case scenarios within the process map. Considered against the Joint Planning Process, forecasting potential COAs within the systems map helps to identify positive and negative tensions, those actors, factors, and forces acting for or against the desired outcome.

Using the THAAD case study, planners should highlight particular paths that the deployment of THAAD might assume, en route to either the best- or worst-case outcome (see fig. 2). For example, the deployment of THAAD has a variable relationship with perceived security, based on the particular actor. The ROK obviously feels more secure with THAAD on the peninsula, whereas North Korea and China both feel less secure. These tensions can then lead to Chinese repercussions and have a direct relationship with regional and economic security considerations.

More importantly, there are two negatively reinforcing loops associated with the perceived security and economic situation in the region. These negatively re-

inforcing loops act as significant drivers toward the worst-case scenario, and potential courses of action must attempt to disrupt these loops or offset them with similar positively reinforcing loops.

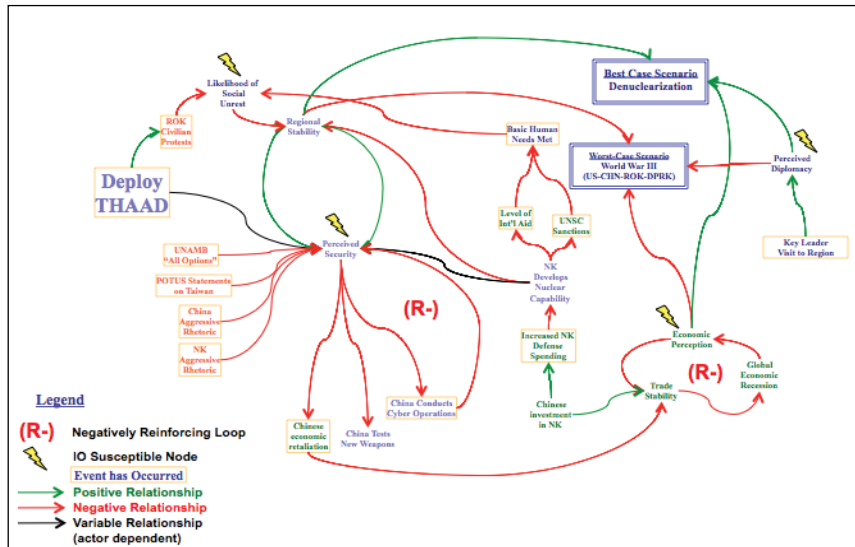


Figure 2. Course of action forecast

Step 3—Identify Key Nodes for Information Operations

Using the mapped COA, planners should then identify which nodes are most susceptible to information operations, either in support of the best-case scenario or in opposition to the worst-case scenario. These nodes are necessarily those that are most susceptible to information operations, such as public opinion and the perceptions of a target audience. Identifying these nodes ensures that the proposed IO campaign is integrated and synchronized with the overall COA. The COA forecast in figure 2 annotates these susceptible nodes with yellow lightning bolts. This technique can also help to determine those COAs in which IO could not be effectively utilized, thus creating a level of risk in the overall plan. The potential effects of IO can then be taken into account during COA Analysis and Wargaming and identified to the decision maker as a potential source of risk. Keep in mind that while certain COAs may be executed without IO support, this circumstance is exceedingly rare in today's complex operating environments.

Step 4—Develop Specific IO Actions

Once the IO-susceptible nodes have been identified, specific IO actions should be developed to affect that particular node. *The Commander's Handbook on Strategic*

Communications provides guidance as to which aspects of IO are best suited to affect various target audiences.³¹ For example, public diplomacy might work best against allies and foreign publics, whereas key leader engagements might work best against specific governors or shuras. These specific actions would then be incorporated into the actual COA itself and analyzed/war-gamed in accordance with current guidance.

Here again, the integration of the JIACG is instrumental as the interagency representatives can help to prevent such information fratricide. Just as the planning group identifies nodes where IO could help or hinder certain outcomes, the JIACG could provide input about what other interagency actions outside the purview of the JPG might affect the operating environment, such as statements being made by the Department of State. The full integration of the JIACG would help to alleviate such fratricide, which could detract from mission effectiveness and desired outcomes.

Once determined and coordinated within the United States government, these specific IO actions should then be communicated and signaled to both the target nation and allies in the region. To reduce surprise and prevent uncertainty in a volatile environment, IO efforts should clearly communicate that certain reactions will occur as a consequence of continued undesired behavior. Additionally, key players in the region should be notified of such planned consequences and consideration given for their potential reservations. For example, following North Korea's nuclear test in February 2013, the United States should have issued unambiguous strategic communication to North Korea and all regional actors that the consequence of another such breach of conduct would lead to the deployment of THAAD. When such a breach occurred, as it did in January 2016, the immediate announcement of the deployment of THAAD would have been seen as a natural consequence of North Korean action and would likely have taken no one by surprise.

Once communicated that THAAD is en route due to North Korean provocation, strategic communication should continue, explaining that while the system is en route and being set up for operations, particular actions may be taken by North Korea to reverse this sequence of events. Then, the US should have told North Korea that if no such corrective measures were taken, THAAD would be operational by a particular date. Again, this ensures that when the United States and ROK announce that THAAD is fully operational, it takes no one by surprise, while offering China a clear timeline during which that they must pressure North Korea to make concessions before THAAD comes online.

While China is never likely to appreciate the deployment of THAAD, clear signaling and warning presented in a logical timeline may lead to better under-

standing and reduced reactionary resistance, which builds trust between the United States and China. Additionally, by communicating each step of the deployment in terms of what China can do to assist with altering the course of events, China is further encouraged to levy pressure on North Korea to concede, rather than the US being seen as a unilateral actor in the region. In other words, before executing a potentially controversial action, conditions must be set utilizing a whole of government approach with a carefully sequenced plan of action.

This four-step process, and the techniques offered within each step, provide a means for IO chiefs and planning cells to construct an integrated and synchronized IO plan, meeting the requirements of current joint doctrine. This analysis, however, revealed several other areas worthy of further research.

Areas for Further Research

Although this analysis of the deployment of THAAD to the Korean peninsula illustrates how systems thinking can be used to mitigate a significant gap in military planning doctrine, utilizing systems analysis within the Joint Planning Process is not necessarily a new idea. Joint Publication 5-0 gives passing reference to developing solutions based on a systems perspective, where “it is critical to consider the relationship between all of the aspects of the system.”³² However, throughout joint planning guidance, planners are instructed on *what* to do (e.g., systems thinking) without techniques or procedures on *how* to do it.

To address these doctrinal gaps, additional guidance is scattered throughout a series of ad hoc commander’s handbooks, best practice papers, and focus papers. Still, nowhere is this information consolidated for ease of dissemination and access.³³ In addition to disjointed references, some of this additional guidance was published by organizations that no longer exist (Joint Forces Command), and therefore must be absorbed by other organizations in order to be retained or updated. Further research may be warranted to determine if joint doctrine is in need of a publications restructuring, providing for a particular publication to list potential tactics and techniques for accomplishing the various requirements levied in joint doctrine. That is, while doctrine and procedural regulations might tell a planner what they should do, another publication series would provide the techniques required to actually perform this requirement. This publication series would be akin to multi-service or service-specific tactics, techniques, and procedures (TTP) manuals, which consolidate TTPs into a single document that provides a means to accomplish requirements levied in other publication series.

In some cases, these TTPs have yet to be determined, especially those concerning how the joint force commander should synchronize information operations and public affairs in support of higher-level objectives.³⁴ Similarly, “subject matter

experts in the field have indicated that a 'Center of Excellence' type organization for [strategic communication] may be useful in developing. . . doctrine, tactics, techniques, procedures, concepts, [and] capturing lessons learned."³⁵ Such a center of excellence could certainly consolidate these TTPs, and will need a means to codify the results. This analysis attempts to mitigate one such gap in doctrinal guidance, though several others remain.

Similarly, this four-step process provides a means to conduct several steps throughout the planning process, to include developing an IO estimate, conducting a center of gravity analysis, conducting COA development and analysis, and the development of IO tasks. Additional research should analyze how systemic thinking might streamline and otherwise synchronize joint planning efforts.

Another area that may warrant additional research concerns the assessment of forecasted scenarios. Ideally, once susceptible inflection points are identified for information operations, planners should be able to inform decision makers of the risks incurred if appropriate information operations are *not* conducted (or not conducted effectively). By using a Bayesian approach,³⁶ planners could tell the decision maker that the overall outcome has a certain likelihood according to each inflection point. Over time, the Bayesian-informed systems model, and the probabilities applied to each inflection point, can be honed. Eventually, joint planners may be able to generate rules of thumb regarding the effectiveness of certain IO actions, when compared to other courses of action.

Conclusion

The authors recognize that utilizing systems mapping necessarily creates an additional layer of work within the planning cell, especially as planners would need to visually depict the PMESII analysis they likely have already completed during JIPOE development. It should be noted that this systemic thinking process is not one that is accomplished solely by the IO cell, but by the entire JPG, in coordination with each other. Despite the additional work, such systemic thinking reduces unintended consequences, lessens information fratricide, and diminishes strategic surprise while also providing several secondary benefits, which save the planning cell work in later steps.

First, since the operating environment and potential COAs are depicted in terms of their nodal relationships, commander's critical information requirements (CCIR) can more easily be determined by analyzing the COA forecast. For example, to determine which outcome the deployment of THAAD is leading toward, CCIRs would be developed that correspond to the nodes along the path to the best- and worst-case outcome. Once developed, this extensive list of information requirements then helps to determine an allocation plan for scarce intelli-

gence, surveillance, and reconnaissance assets, provides commanders with a means to analyze the entire operational environment, and a method to integrate branch and sequel plans into the overall campaign plan, as the CCIRs indicate which outcomes are becoming more and less likely to materialize.³⁷ Similar increases in effectiveness can be achieved by using the systems map to evaluate centers of gravity and courses of action during other portions of the planning process.

Second, utilizing this method allows for a level of assessment against current IO efforts. That is, if an IO action is expected to affect a certain node within the process map, and this effect does not take place, planners have received an important piece of information.³⁸ Either, the IO effort was ineffective, or the process map may be missing a node, which provides additional input the planners had not accounted for. Over time, both the process map and IO efforts can be honed to achieve the desired objectives.

To achieve these objectives, doctrine needs to do a better job of providing a means for *how* planners are expected to perform the requirements levied upon them. This analysis has provided a simple four-step plan to systemically generate an integrated, synchronized information operations plan while offering several areas for further research to continue incorporating “more cowbell” into the Joint Planning Cell. Changing such deeply ingrained behavior is hard and may take a generation, but such changes cannot take root until doctrine changes first.

Despite more than a decade of emphasis, information operations remain the “cowbell” of joint operations. Often ignored, or hastily included as an afterthought, information operations have yet to achieve the level of parity as offensive, kinetic operations. Despite these limitations, “success in military operations can often be achieved or lost based on how regional, international, and domestic audiences perceive our words and actions. Gaining the support of these audiences and the defeat of the adversary’s message is often the critical battle—the one in which we must be engaged and the one that has to be won for any lasting success.”³⁹ ★

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25. “In fact, the word *analysis* comes from the root meaning “to break into constituent parts.” Therefore, while PMESII is a widely used analysis framework, it fails to relate each node to each other, nor to show how they interrelate. See Daniel Aronson, “Overview of Systems Thinking,” *Thinking Page*, 1998, <https://www.thinking.net>, 1.
26. Aronson, “Overview of Systems Thinking,” 1.
27. For guidance on producing systems maps, see Daniel McCauley, *The Practitioner’s Guide to Strategic Foresight* (Norfolk, VA: Joint Forces Staff College, 2016); or Colleen Lannon, ed., *A Beginner’s Guide to Systems Thinking* (Westford, MA: Pegasus Communications, 2008).
28. Christopher Paul, “‘Strategic Communication’ is Vague: Say What You Mean,” *Joint Force Quarterly* 56 (1st Quarter 2010): 10–13, <https://www.rand.org/>.
29. Department of Defense, *Strategy for Operations in the Information Environment* (Washington, DC: Pentagon, June 2016), 5.
30. Paul, “Inform, Influence, and Persuade,” 88.
31. US Joint Forces Command, *Commander’s Handbook for Strategic Communication and Communication Strategy* (Suffolk, VA: Joint Warfighting Center, 24 June 2010), IV-17.
32. JCS, *Joint Operation Planning*, III-10–III-11.
33. See US Joint Forces Command, *Commander’s Handbook*; and Deployable Training Division, *Communication Strategy and Synchronization* (Washington, DC: Joint Staff J7, May 2016).
34. US Joint Forces Command, *Commander’s Handbook*, xviii.
35. US Joint Forces Command, *Commander’s Handbook*, xix.
36. Bayesian methods allow for subjective probabilities, which in our case are informed by expert military judgment and experience. “When performing a Bayesian analysis, you begin with a prior belief regarding the probability distribution of an unknown parameter. After learning information from observed data, you change or update your belief about the unknown parameter and obtain a posterior distribution.” In essence, the probability is honed through past and future predictions. See SAS, “Bayesian Analysis,” accessed 10 May 2017, <https://support.sas.com/>.
37. Will Atkins, “Theory and Practice: Developing CCIRs Through Alternative Analysis,” *American Intelligence Journal* 32, no. 2 (1 July 2016): 116, <https://cdn.ymaws.com/>.
38. CCIRs can be specifically developed to determine the outcome of IO efforts within the course of action.
39. Deployable Training Division, *Communication Strategy and Synchronization*, 1.