Challenging the Application of PMESII-PT in a Complex Environment

A Monograph
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14. ABSTRACT
Military officials often utilize the PMESII-PT acronym (Political, Military, Economic, Social, Information, Infrastructure, Physical Environment, and Time) as an analytical start point to assess an operational environment. However, the linear methodology restricts a holistic understanding of fundamentally asymmetric realms where U.S. military leaders currently operate. Scholars and other experts have previously applied more ontologically based and holistic approaches to understand complex social systems. By comparing both PMESII-PT and these holistic approaches, this paper accomplishes three objectives. First, the monograph concludes that the linear PMESII-PT methodology is not sufficient to assess and convey understanding of a complex environment. Second, the monograph specifically identifies the incorporation of identity theory and the proper use of the narrative as the gap between PMESII-PT and holistic approaches. Finally, in light of accusations that the U.S. military still exhibits a lack of cultural understanding, this monograph presents a more conceptual start point for military designers. By applying a process of metaquestioning to explore the facets any complex environment, military designers can ultimately produce an identity-based narration which leads to a level of holistic understanding unachievable by traditional methods.

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Abstract

CHALLENGING THE APPLICATION OF PMESII-PT IN A COMPLEX ENVIRONMENT by MAJ Brian M. Ducote, SVC, 102 pages.

Military officials often utilize the PMESII-PT acronym (Political, Military, Economic, Social, Information, Infrastructure, Physical Environment, and Time) as an analytical start point to assess an operational environment. Using the categories within the PMESII-PT construct, planners can guide their efforts to understand in detail not only the factors that comprise an environment but also the interactions among the various agents within the system. However, the linear methodology only successfully reveals the what but not the why of complex systems. PMESII-PT restricts a holistic understanding of fundamentally asymmetric realms where U.S. military leaders currently operate. According to Jasmid Gharajedaghi in *Systems Thinking: Managing Chaos and Complexity*, complex environments exhibit characteristics of openness, purposefulness, multidimensionality, emergence, and counterintuitiveness. Therefore, any form of inquiry designed to understand such an environment must address such aspects to convey meaning.

In the past, scholars and other experts applied more ontologically based and holistic approaches than PMESII-PT to not only address the characteristics of complex systems but to convey to their audiences a rich understanding of such environments. By comparing both PMESII-PT and these holistic approaches in the context of Gharajedaghi's precepts, this monograph accomplishes three objectives. First, the monograph concludes that the linear PMESII-PT methodology is not sufficient to assess and convey understanding of a complex environment. Second, the monograph specifically identifies the incorporation of identity theory and the proper use of the narrative as the gap between PMESII-PT and holistic approaches. Finally, in light of accusations that the U.S. military still exhibits a lack of cultural understanding, this monograph presents a more conceptual start point which explores the facets any complex environment in order to produce an identity-based narration which leads to holistic understanding.

Rather than using a linear and predefined list of variables, like PMESII-PT, users of this more abstract approach will apply a more generic form of inquiry to ascertain the why and not simply the what of an environment. In an effort to ascertain a holistic understanding rather than a detailed familiarity, the method of inquiry uses the more conceptual dimensions of wealth, truth, beauty, values and power of complex environments as a general framework. Instead of using specific categories to fill in answers, the proposed approach guides users to ask questions about these very foundational social facets. Applying an iterative and meta-cognitive form of inquiry that asks questions about the essence of the environment in the quest to convey meaning, the proposed approach should be able to lead users to a holistic understanding as opposed to just a substantial increase in knowledge about a complex environment.

There is no shortage of texts on systems thinking as it applies to problem solving. Business strategists, military leaders, architects, and artists attempt to rightfully incorporate systems based approaches in their respective organizations or disciplines. A lot of academic research focuses on either how to leverage systems thinking to achieve results in complex environments or the nature of complex environments. However, none provide a conceptual approach to understand the environment holistically. This monograph attempts to address in greater detail a challenge facing specifically system thinkers in the military who require a deep understanding of the complex social milieus where they operate. Furthermore, this monograph provides the framework for a holistic approach that can ideally result in a degree of understanding currently unattainable through PMESII-PT.

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Introduction

Throughout Operations Iraqi and Enduring Freedom, the U.S. government has charged U.S. military leaders with addressing social challenges that demand far greater levels of contextual understanding beyond traditional military responsibilities. At a recent security conference in Munich, Germany, GEN David Petraeus, the current Commander of U.S. Central Command (USCENTCOM) stated, "…that there are no purely military solutions in Afghanistan."[1] In searching for alternative solutions, one can conclude that understanding must extend beyond what is traditionally required for military operations. In 2005, at the height of sectarian strife in Iraq, U.S. leaders operating in complex social systems were building infrastructure by day and fighting insurgents by night. LTC Jim Crider, a squadron commander in Baghdad during the surge of U.S. forces in 2007, echoed a prevalent sentiment that his organization had to "…alliance with the people, develop local economic opportunities to provide alternatives to the insurgency, and build a bridge between citizens and the Iraqi government…" in order to restore peace. [2] While operating in complex environments, U.S. military leaders have to expand beyond military means to harness the inherently complex nature of the social system.

Owing to the ever increasing complexity of such social challenges, U.S. military leaders have sought to gain a better understanding of operational environments in which they find themselves. Across the spectrum of problem solving methodologies adopted by both military and civilian officials, leaders generally contend that one must first understand the nature of an environment before attempting to resolve any issues within that environment. Scientists have historically utilized various methods to describe and expand understanding of a particular human based system to then exert influence. Alexander Rosenberger, a prominent social scientist,

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[1]GEN David Petraeus**, "**The Future of the Alliance and the Mission in Afghanistan" (Lecture, 45th Munich Security Conference, Munich, Germany, February 8, 2009).

[2] LTC Jim Crider, *Inside the Surge: One Commander's Lessons*, (Washington, D.C.: Center for a New American Security, June 2009), 7.

suggested that the predicative nature of the social sciences "…is a sort of byproduct of its real goal, which is to provide understanding through interpretation."[3] In the view of natural scientists, the realm of social science "…[has] been free from the greatest obstacle to advance in the natural science: the need to carve out entirely new ways of looking at the world." [4] Social scientists retain an advantage in that the fundamentals of social systems, such as "…actions, beliefs, and desires…" remain generally unchanged in specific environments.[5] Therefore, as in the natural world, social scientists should easily be able to derive quantifiable measures to explain the environments found within complex systems. Some social scientists, known as naturalists, agree and contend that observers can use rigid social laws to predict behavior via an enhanced understanding of a particular system. Depending on their schools of thought, social and natural scientists promote various methodologies to gain a better understanding of an environment. [6] Accordingly, leaders within organizations like the U.S. military, which depends on an accurate understanding of an environment, may also employ similar models to describe such complex systems.

The U.S. military utilizes multiple linear methods to frame, solve, or simply expand understanding of a particular subject, challenge, or environment. The Military Decision Making Process (MDMP) consists of eight steps with a myriad of subordinate processes that all contribute to the problem solving methodology. At the strategic level, U.S. senior military leaders use a

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[3]Alexander Rosenberg, *Philosophy of Social Science* 2nd ed. (Boulder, CO: Westview Press, 1995), 20.

[4]Ibid., 15.

[5]Ibid.

[6]Paul R. Mullins in *Race and Affluence,* Ann Brower Stahl in *Making History in Banda,* and Patricia E. Rubertone in *Grave Undertakings* explore various methods of combining material artifacts and quantifiable data with anthropology to more accurately depict a particular environment. Additionally, market researchers, like Rhonda Abrams in *Successful Business Research,* present multiple systematic and objective data collection methodologies to accurately define a target environment or market.

similar planning process known as the Joint Operation Planning Process (JOPP).[7] Within both planning procedures, U.S. military leaders are directed to first define and understand the operational environment. To a greater extent than conventional conflicts, the unconventional battlefield presents complex social environments that demand such understanding. According to FM 3-0, U.S. military leaders have at their disposal another model, known as PMESII-PT, to better understand an operational environment before conducting operations.[8] Like other tools, military leaders can utilize the concept to create an analytical framework, assess a social environment, gain a better understanding of a geographic area, and subsequently apply that understanding to achieve objectives. In their book *Harnessing Complexity*, Robert Axelrod and Michael Cohen, two well known social scientists, stated that analyzing a complex system or environment "…gives us a grounded basis for inquiring where 'leverage points' and significant trade-offs of a complex system may lie."[9]

From a military perspective, one can appreciate the need to conduct a comprehensive assessment of an operational environment to determine "…what kinds of situations may be resistant to policy intervention, and when small interventions may be likely to have large

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[7]For an overview of the MDMP and JOPP, a reader can consult U.S. Army Field Manual 5-0 and JP 5-0 respectively which detail the planning processes. However, of importance to this monograph, a reader must understand that both processes begin with a requirement to understand the environment.

[8]PMESII stands for Political, Military, Economic, Social, Information, and Infrastructure. Later, the U.S. military doctrine writers added Physical Environment and Time as additional factors to consider in defining an operational environment. Some military personnel prefer another tool, known as ASCOPE, to define an operational environment. ASCOPE stands for Area, Structure, Capabilities, Organizations, People and Events. Additionally, U.S. military leaders use METT-TC to reflect mission variables which are contrived from the environmental factors (PMESII) but specifically apply to a given mission. METT-TC stands for Mission, Enemy, Terrain and Weather, Troops and Support, Time Available, and Civilian Considerations. U.S. Army Field Manuals 5-0, 3-0, and even 5-2 Design advocate PMESII, PMESII-PT, ASCOPE, or METT-TC as methodologies to ascertain a better understanding of an environment. Furthermore, these methods are generally categorized as sub steps to a larger process. For example, according to FM 5-0, one can use METT-TC (or PMESII) during the Intelligence Preparation of the Battlefield process which consists of four additional steps and is a part of the larger Military Decision Making Process.

[9]Robert Axelrod and Michael D. Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier* (New York, NY: Basic Books, 2000), 21.

effects."[10] In a journal article "Ontological-Cultural Asymmetry and the Relevance of Grand Strategies," Joseph Henrotin and Tanguy Struye de Swiedlande made the argument that, before and during the Cold War, adversaries often demonstrated symmetry with respect to instrumental means, norms, and rationalities. Wars, according to the two noted political scientists, "…were planned and conducted following the same pattern, the same code of honour."[11] Despite the realization of a nuclear threat and an ever increasing disparity between belligerents, stronger nations still observed rationalities that "…were often linear, easily creating norms and rules for adversaries…"[12] As weaker enemies adapted their modus operandi to asymmetric means, norms, and rationalities to attenuate disproportionate capabilities, stronger nations failed to realize that "…'classical', nuclear, suasion loses its heuristic value" in such contexts.[13] The authors then suggested that, to fully understand the essence of an environment "…obedient to different logics…," leaders must adapt an ontologically based approach to ascertain meaning.[14]

Although complete knowledge is never possible, tools such as PMESII-PT serve as starting points for future analysis of such complex environments. For example, various regions within the Arab-Muslim world represent some of the most intricate, complex, and challenging social systems that U.S. military leaders currently face.[15] Steeped in a history divergent from

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[10]Ibid.

[11]Joseph Henrotin and Tanguy Struye de Swiedlande, "Ontological-Cultural Asymmetry and the Relevance of Grand Strategies," *Journal of Military and Strategic Studies* 7, no. 2 (Winter 2004): 2.

[12]Ibid., 3.

[13]Ibid., 4.

[14]Ibid., 23.

[15]Before proceeding, the reader must understand that the words "Arab" and "Muslim" are not synonymous. The author of this monograph uses the word "Arab" in reference to physical locations or to describe individuals with similar cultural, historical, genealogical, and linguistic backgrounds. The Arab World actually includes a large portion of Northern Africa and most of the Middle East but nothing east of Iraq, Saudi Arabia, and Oman. On the other hand, "Muslims" are those who practice the religion of Islam. Although the words are related, they are by no means interchangeable. Many Arabs practice Islam and are, therefore, considered Muslims. However, many Arabs are also Christian or Jewish. Contrary to what many believe, the Arab world is only a part of the Muslim world which includes regions or nations that predominantly practice Islam. For the purpose of this paper, the author uses either an Arab or Muslim

ours, these societies have developed cultural norms, expectations, and values that are fundamentally different from an Occidental perspective. When operating in such complex realms, U.S. leaders must define the contemporary operating environment with sufficient nuance to understand the system and its challenges. U.S. military leaders often leverage PMESII-PT to gain that understanding. Axelrod and Cohen contended that "…complexity is often rooted in patterns of interaction among agents."[16] Therefore, when operating in such environments, "…we might expect systems to exhibit increasingly complex dynamics when changes occur that intensify interaction among their elements."[17] In light of such a definition, one must ask how a seemingly one dimensional and static tool, like PMESII-PT, can accurately depict a highly volatile system with multiple and competing logics that increase and decrease based on agent interaction. Although PMESII-PT represents a starting point to assess a complex environment, one must challenge the utility of applying a linear concept like PMESII-PT to an operational environment that is holistically asymmetric.[18]

Methodology: A Step by Step Approach and a Central Figure

Before continuing, a reader should have a brief explanation of this monograph's general layout and methodology used to answer the primary research question and thus determine the utility of applying a linear concept like PMESII-PT to an operational environment that is holistically asymmetric. The paper is predicated on the fact that military officials use PMESII-

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context to provide an example of a complex environment for analysis. What matters most is the inherent complexity within both the Arab and Muslim worlds and the methods different people use to convey meaning about such complex environments.

[16]Axelrod and Cohen, 26.

[17]Ibid.

[18]Before proceeding, the reader must understand some definitions to avoid confusion. Refer to Appendix A for specific definitions of critical terms. For now, the reader must understand the difference between holistic/non-linear approaches and linear/reductionistic approaches. Reductionism refers to the theory that complex systems can be explained by analyzing basic physical mechanisms that are in operation. Holism refers to the notion that all the properties of a given system cannot be determined or explained by its component parts alone. Contrary to reductionism, holism suggests that the system as a whole determines how the parts behave.

PT to gain understanding of an environment. However, this seemingly obvious assumption is not so obvious when one considers the historical origins of the methodology. Although the original intent of PMESII-PT is not easily identifiable, the author of the monograph ascertained at least one explanation in an interview with Mr. Mark DeMike, who was a former Deputy Chief of the PMESII Division of the Battle Command Training Center at Fort Leavenworth, Kansas. Currently serving as a deputy G3 for First Army, DeMike stated that PMESII was developed in the U.S. military joint community to "…come up with a way to assess the systems in the operational environment."[19] According to DeMike, the impetus for creating PMESII was twofold. First, just as the military would target systems like tanks and air assets in a conventional conflict to achieve victory, creators of PMESII wanted to target the systems involved with nation building to achieve success. Second, members of the joint community were not content with ASCOPE as a tool to assess systems and wanted a more encompassing methodology.

Based on DeMike's explanation of why military officials created PMESII, a reader can now better understand the potential misapplication of the methodology in today's military. According to DeMike, PMESII was never intended originally to understand an environment but rather "…to simply identify systems in an operational environment to target."[20] DeMike insinuated that PMESII was restructured later to accomplish a task that it was not originally designed to achieve. Founders of PMESII sought knowledge to untangle the complicated aspects of a system. Then, they wanted to use their findings in the targeting process. However, they did not necessarily seek in depth meaning and understanding about the complexity of a system.[21]

As evidence to the fact that PMESII was altered to derive meaning, DeMike pointed to the logical underpinnings of the two factors not originally included in PMESII: "Physical

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[19]Mr. Mark P. Demike, interview by author, March 26, 2010.

[20]Ibid.

[21]Readers should reference Appendix A for an explanation of the differences between complicated and complex.

Environment" and "Time." Both time and terrain, according to DeMike, "…are not systems but effects on systems."[22] For example, time is not a system but has a tremendous effect on the political, military and economic systems of an operational environment. Therefore, DeMike suggested that "…someone in the military attempted to alter the methodology to become a tool to understand a complex environment by analyzing both the systems and factors that influence such environments…" Although the origins and intent of PMESII remain difficult to outline, DeMike highlighted a major assumption of this monograph. Based on research thus far, the author assumes that military officials, according to both doctrine and surveys, believe the methodology to be an apropos tool to understand complex environments and not simply a tool to untangle complicated aspects of the environment.

In terms of layout and methodology, this paper will first outline the characteristics of linearity and define clearly how PMESII-PT, in its current use, can be considered a linear methodology. Next, using current U.S. Army doctrine, this paper will outline briefly all the components of PMESII-PT and describe what each tenet means to give the reader a working understanding of the methodology used to primarily define an environment. In order to initially compare and contrast PMESII-PT with other forms of inquiry, the paper will then present three very distinct holistic approaches that describe a similar environment. By doing this, the reader will not only see how the holistic approaches relate to each other but also how they differ from PMESII-PT. Next, in order to quantify more specifically the differences between linear and holistic approaches, the paper will use as a guide for efficacy five characteristics of complex environments outlined by Jasmid Gharajedaghi, who is a former Director of the Busch Center which serves as the research arm of the Social Systems Sciences Department at the Wharton School.

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[22]Ibid.

This monograph has two primary assumptions. First, that Gharajedaghi's characteristics were valid facets of complex environments. In order to make such a conclusion, the author of this monograph searched through multiple literary sources to discern what most authors agreed to be defining qualities of complexity. Although many authors attempted to characterize complexity using similar definitions, Gharajedaghi's precepts of openness, purposefulness, multidimensionality, emergence, and counterintuitiveness represented the most encompassing list of characteristics. Second, the author of this monograph assumed that any form of inquiry designed to understand complex environments must address Gharajedaghi's characteristics to convey meaning. Gharajedaghi did not present his precepts as a model, but the author of the monograph used them to determine the efficacy of any approach applied to ascertain meaning from complexity. In other words, the author of this monograph assumed that the more an approach addressed Gharajedaghi's facets, the better it was as a form of inquiry.

After highlighting the differences between the linear PMESII-PT construct and the holistic approaches by using Gharajedaghi's concepts, the paper then explored the gap between the two approaches. Moving beyond the mere effectiveness of the different methodologies in addressing Gharajedaghi's characteristics, the paper will focus on the inclusion of a narrative format and identity theory in holistic forms of inquiry. Finally, the paper will propose a more conceptual start point which explores the facets any complex environment in order to produce an identity-based narration which leads to holistic understanding. Once again, the paper will turn to Gharajedaghi for a baseline framework. Gharajedaghi suggested that wealth, truth, beauty, values, and power represent the abstract dimensions of any complex system. Using these facets as a cognitive starting point, the author of this monograph will develop a holistic approach that can ideally result in a degree of understanding unattainable through PMESII-PT.

In addition to a step by step layout to this monograph, a reader can also note the centrality and influence of Gharajedaghi throughout the paper's methodology. Gharajedaghi has an exceptional reputation as one of the most influential systems thinkers today and many extrapolate

his concepts beyond their original applications to understand other systems.[23] Additionally, Gharajedaghi worked extensively with the preeminent systems scientist, Dr. Russell Ackoff, who Gharajedaghi referred to as a friend and mentor.[24] Throughout research for this paper, the author of this monograph discovered countless references and citations to Gharajedaghi as one of the foremost experts in the systems field. However, beyond his stellar reputation and expertise, Gharajedaghi provided the author of this paper with the most encompassing list of concepts to then conduct analysis. For example, although many authors provided aspects of complex environments or dimensions of social systems in their respective works, Gharajedaghi considered the most complete list and then provided a detailed explanation. The author of this monograph chose to use Gharajedaghi's concepts as a baseline to conduct further analysis and to derive novel concepts. However, although Gharajedaghi's reputation certainly added to his legitimacy as a source, the author used his ideas more for their all encompassing and inclusive nature. Now that a reader understands the basic framework for the paper and the methodology used, one can begin to answer the monograph's primary research question: What is the utility of applying a linear concept like PMESII-PT to an operational environment that is holistically asymmetric?

PMESII-PT: A linear construct or misapplied tool?

Prior to determining the effectiveness of PMESII-PT as a linear tool, this paper will briefly explore and expose the inherent nature of linearity and assess the current application of PMESII-PT in the U.S. military. Dr. Linda Beckerman, a former student of COL John Boyd and prolific author in complexity science, defined linearity as "…processes and actions…in which

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[23]Darek M. Eriksson, "On the Usefulness of the Ackoff–Gharajedaghi Model of System Types for the Design of Business Systems," *Systemic Practice and Action Research* Vol. 17, no. 2 (April 2004): 75-81. In this text, Eriksson attempted to expand and apply one of Gharajedaghi's concepts to understand a system like malfunctioning businesses. Like Eriksson's writings, the author of this monograph has selected Gharajedaghi for his expertise, his reputation, and the sheer inclusiveness of his ideas.

[24]Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity; A Platform for Designing Business Architecture* (Oxford, UK: Elsevier Science and Technology Books, 2006), xv.

output is directly proportional to the input."[25] Using a linear approach, outside observers of a system can input data into a given model to then ascertain a greater degree of familiarity with an environment. Ideally, through the "…simple additions of the interactions…between agents," a researcher using a linear methodology can derive emergent trends of the environment and subsequently better understand the system.[26] Beckerman also posited that linear methodologies often tend to exhibit static variables within static frameworks. Regardless of the changes in the environment, the "ratio of input to output continues to be constant…" and users employ the same variables within the linear methodology to gain understanding.[27] For example, during the Vietnam War, military officers used a static component like body count numbers as a means to assess a conventional military environment.[28] According to Beckerman, such a method of assessing military success would "…exemplify thinking along…linear attrition lines" for two reasons. First, the measurable data would not cause the category to adapt or change based on feedback.[29] Second, the "…tacit although rarely stated, assumption is that 25% more firepower will produce 25% more enemy casualties."[30]

In the context of PMESII-PT, military leaders use the framework to organize observed input in order to ascertain a greater understanding. In accordance with Beckerman's definition of linear systems, users seek input for the model under the assumption that "…simple additions of

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[25]Linda P. Beckerman, *The Non-Linear Dynamics of War* (Kansas City, MO: Science Applications International Corporation, April 1999), 1.1.

[26]Ibid., 2.3.

[27]Ibid., 1.3.

[28]Historians such as Sir Robert Thompson, Andrew Krepinevich, and Guenther Lewy, all argue that the 1965-68 "Strategy of Attrition" in Vietnam was deemed successful or unsuccessful through body count numbers that then Secretary of Defense McNamara wanted to see himself. For additional information and perspective on the use a multiple mathematically based and linear models to access the operational environment during Vietnam, readers can consult *Dereliction of Duty* by H.R. McMaster.

[29]Ibid., 1.4.

[30]Ibid.

the interactions…between agents" will elucidate a greater understanding of the environment.[31] Additionally, once a PMESII-PT user classifies data under one of the categories and illustrates the relationship that the information has with other data points throughout the model, the variables (P-M-E-S-I-I-P-T) still remain static. For example, a Western definition of the "Political" component of PMESII-PT may conflict directly with the definition of those within the observed system. However, military officials do not redefine or rename the "Political" component of the model. The model and its components remain static and drive research of an environment rather than the environment driving research to then formulate a model.

Dr. Alan Beyerchen, a professor at Ohio State University, provided a similar and more historic definition of linearity. Beyerchen defined any linear tool as having two qualities. First, linear systems "…display what in economics is called 'constant return to scale' implying that small causes produce small effects, and that large causes generate large effects."[32] Thus, linear models tend to consider scale in terms of a steady ratio rather than an unpredictable one. Although researchers can use linear models to highlight and even discover relationships, one may miss the gravity of such a relationship with respect to the rest of the system. Second, according to Beyerchen, a linear system exhibits the quality of additivity. A linear model, for example, is one that "…allows the problem to be broken up into smaller pieces that, once solved, can be added back together to obtain the solution to the original problem."[33]

Again, Beyerchen's definition of linearity accurately depicts the PMESII-PT methodology. With regard to scale, military leaders understand that the amount of quality input into PMESII-PT directly correlates to the model's utility. For example, if a user can further define a sub-component of PMESII-PT, then the individual also emboldens the overall usefulness

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[31]Ibid., 2.3.

[32]Alan D. Beyerchen, "Clausewitz, Nonlinearity and the Unpredictability of War," *International Security 17:3* (Winter 1992), 53.

[33]Ibid.

of the model to assess an environment. In U.S. Army Field Manual (FM) 3-0, authors recommend that "[w]henever possible commanders and staffs [should] utilize specialists in each variable to improve analysis."[34] In this sense, the authors suggested that a higher quantity input will invariably yield greater clarity of output. Furthermore, through an analysis of relationships between data points, users of PMESII-PT can determine both large and small agents that retain large and small impacts within the overall system. By analyzing the sheer interconnectedness of a categorized agent or event within the PMESII-PT construct, one can potentially draw conclusions about the actor's proportional influence within the system.

In regard to additivity, PMESII-PT again fits the description. In using the grassroots and bottom-fed methodology, military leaders seek to define smaller and independent aspects of an environment, classify the data points into categories, explore relationships, and subsequently garner a greater understanding. In FM 3-0, the authors admitted "human societies are very complicated and defy precise 'binning'" but utilizing PMESII-PT can "help describe each operation's context for commanders and other leaders."[35] Through a "comprehensive analysis of the [PMESII-PT] variables…," a leader can supposedly gain understanding.[36] Like Beckerman's and Beyerchen's definitions of linear models, the authors of U.S. Army field manuals implied that, through a detailed analysis of the PMESII-PT components, one can obtain a greater understanding of a given operational environment. Using PMESII-PT, U.S. military leaders believe "…the behavior of a system can appropriately be broken into parts that can be compartmentalized…" for analysis and understanding.[37] As parts or observations are linked or interrelated, advocates of PMESII-PT believe the model will yield a greater output in the form of

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[34]U.S. Department of Defense, *U.S. Army Field Manual 3-0, Operations* (Washington, D.C.: U.S. Government Printing Office, February 2008), 1-5.

[35]Ibid.

[36]Ibid.

[37]Beyerchen, 53.

understanding. When one considers PMESII-PT by definition as an independent system of systems, a user can readily detect facets of linearity.[38]

Some U.S. military leaders contend that PMESII-PT is merely a tool and that a user, through no fault of the model, wrongly applies linear techniques to evaluate a complex system. In a survey of over 130 U.S. officers attending the Command and General Staff College, 65 percent of the surveyed students defined PMESII-PT as a means to gain an overall better understanding of an environment; however, they did not generally recognize the methodology as a means to derive a unique understanding which extends beyond the sub-components of the model (see Appendix B).[39] Assuming there is some validity in the claim that PMESII-PT exhibits linearity or compels users to act in a linear fashion, this paper will now explore the limitations of the model. Using the Arab world as a context to examine the original hypothesis, this paper will determine the utility of using PMESII-PT to assess such complex environments and then ultimately offer a more abstract ontological approach to gain a holistic understanding.[40]

PMESII-PT Variables Defined: Seemingly Comprehensive but Woefully Incomplete

According to FM 3-0, military officials can apply PMESII-PT in a complex atmosphere to obtain a greater understanding of not only the specific components within the system, but also the overall environment. In an attempt to depart from even more explicitly linear models used in

[38]For additional reading on linearity and non-linearity, Zvi Lanir and Gad Sneh wrote a white paper entitled "The New Agenda of Praxis." In this paper under the "Systemic Thinking" section, the authors discussed in detail differences between linear and non-linear approaches and mindsets.

[39]The survey was completed by U.S. military officers attending the Command and General Staff College. The survey provided the doctrinal definition of PMESII-PT and asked students about their understanding and employment of the methodology based on their operational experiences. See Appendix B for a copy of the survey with a Quality Assurance Office control number of 10-061.

[40]A reader must understand what the author of this monograph means by an abstract approach. The point of the research is to develop a holistic method of inquiry. However, unlike PMESII-PT, this approach will exhibit more abstract qualities that are separated from embodiment. Rather than quantifying definitive concepts like the "military" or "infrastructure" within a complex system, an abstract approach would focus more on intangible concepts like "power" or "values." See Appendix A for more detailed definitions.

the past, authors of FM 3-0 occasionally encourage users to assess the interrelatedness of all PMESII-PT components in the context of each other.[41] The first task outlined in the PMESII-PT construct is to define political entities. Authors of FM 3-0 explained the "Political" component of the system in the context of other sub-components within the PMESII-PT model. Authors insisted that "[u]nderstanding political implications requires analyzing all relevant partnerships…" including other political, economic, military, religious, and cultural aspects within the system.[42] Using this analysis, planners may find seemingly useful connections between political entities and other organizations within the operational environment. For example, if a society has military figures which often double as political figures, then the PMESII-PT methodology could capture this one dimensional pairing within the "Political" and "Military" tenets. Furthermore, the discovery of such a relationship would enhance understanding of the environment to a degree thus "validating" the PMESII-PT methodology.

LTC Jim Crider published his lessons learned in a Center for a New American Security publication. After reading the leader's document, one can gain insight into the nature of political considerations within the Arab world.

> An opportunity arose in March 2008 when the Iraqi Government announced that they wanted to form tribal support councils from the local population to serve as

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[41]Through informal interactions with a limited number senior U.S. Army leaders, the online survey administered to U.S. Army officers attending the Command and General Staff College (CGSC), and through blog entries on the U.S. Army Combined Arms Center website, the author of this monograph concluded that proponents of the PMESII-PT methodology felt that the implied task of PMESII-PT users was to interrelate or connect data points with other data points within the model. For example, users should recognize and annotate that data within the "Political" category will invariably have a relationship with data in the "Social" category. Advocates of PMESII-PT suggested that understanding the interconnectedness of the various components is critical to gaining an overall understanding of the environment. PMESII-PT users make some assumptions in regard to the ability of the methodology to relate various observations across the spectrum. First, users assume that interrelatedness, as defined above, yields understanding. Second, users assume that understanding is primarily derived from an analysis of observable behavior. Although FM 3-0 does consistently advocate this interconnected approach, U.S. Army doctrine seems to lose focus of this aspect in its current explanation of the PMESII-PT methodology. Nonetheless, such an interrelated approach is not found in even more linear models, like METT-TC, which preceded PMESII-PT by a number of years.

[42]FM 3-0, 1-6.

> another voice for residents. In many ways, it appeared to be a parallel organization to the existing District Advisory Councils – but such was politics in Iraq. We worked with our most influential leaders in the area and coached them on organizing and holding an election.[43]

In this example, a military leader can identify the obvious connection between political entities and social groups within a particular Arab society. Such an observation in relation to PMESII-PT would potentially lead users to highlight, under the "Political" sub-component, the social and economic influences at the local level.

The second component of PMESII-PT involves the military. FM 3-0 authors defined the "Military" facet of a complex system in a compartmentalized fashion. In other words, authors do not explicitly encourage users of PMESII-PT to connect military related concepts to other sub-components of the model. Rather, authors suggested that analysis should "…focus on each [military] organization's ability to field capabilities and use them domestically, regionally, and globally."[44] Furthermore, FM 3-0 authors suggested that users of PMESII-PT define aspects of military organizations such as doctrine, manpower, training, and leadership. However, according to the doctrinal definition of the "Military" facet of PMESII-PT, users are not guided to conduct a more comprehensive analysis in light of other PMESII-PT sub-components.

Even giving authors of FM 3-0 the benefit of the doubt, one can readily witness the necessity to characterize military organizations through other PMESII-PT tenets. HAMAS, the Palestinian terrorist organization, represents perhaps the most salient example of a Muslim military entity that is inextricably tied to other political and social facets of a society. HAMAS has built up its strength through grassroots social networks and promulgates a well advertised political campaign for the destruction of Israel. To define HAMAS exclusively in military terms

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[43]Crider, 18.

[44]FM 3-0, 1-6.

would prove short sighted. [45] However, using the PMESII-PT model, military planners can also highlight the details of this terrorist military organization in the context of political, social, and economic factors.

The third component of PMESII-PT is referred to as the "Economic" factor. The authors of FM 3-0 described the aspects of this tenet using a very traditional understanding of economic entities. Authors outlined a need to assess the trade, monetary policy, institutional capabilities, and industrial organizations which encompass "…individual and group behaviors related to producing, distributing, and consuming resources."[46] Furthermore, authors highlighted the criticality of analyzing the economic capacity of an environment in order to "…enhance understanding [of] the social and behavioral dynamics of friendly, adversary, and neutral entities."[47]

In June of 2009, Dr. Frank Gunther, the senior economic advisor for Multi-National Coalition-Iraq, provided commanders with an economic assessment of the Iraqi economy. Just as FM 3-0 authors imply, one can identify several influences clearly extending beyond just economic factors through traditional institutions (see Appendix C). Some examples of how social and political influencers are interrelated to the "Economic" category involve the following: rampant corruption within both Iraqi society and among government officials with regard to salaries, a general distrust of government entities to adequately leverage economic potential, and a bureaucratic trade process instituted and supervised by the Iraqi government. In addition, Gunther not only highlighted the obvious correlation between oil exports and overall security but

[45]In an article "The Rules of War and Ethical Dilemmas in Counter Terrorism," Moshe Ya'alon provided an analysis of the moral and political objectives of both Hamas and Israel. For the purpose of this monograph, the article shows the intricacies of Hamas across the PMESII-PT spectrum and, consequently, how their activity requires analysis far beyond the military capacity of the organization. The strategies and tactics of both Israel and Hamas have resounding political, moral, economic, and physical impacts.

[46]FM 3-0, 1-6.

[47]Ibid., 1-7.

also the correlation between unemployment and potential insurgency growth. As FM 3-0 indicated, military planners can infer many connections between economic factors and other PMESII-PT sub-components.

The fourth variable in PMESII-PT is entitled "Social" and includes religion, culture, demographics, migration trends, and many other aspects to consider when assessing a complex system. FM 3-0 authors explained clearly the complex nature of social networks and contended individuals and groups can demonstrate loyalty to a myriad of entities which can morph, disappear, and even sub-divide over time. FM 3-0 authors further suggested that "[c]ultural awareness helps identify points of friction within populations, helps build rapport, and reduces misunderstandings."[48] By definition, authors of FM 3-0 suggested that military leaders can gain awareness of a culture by making certain observations and then examining such observations in detail across the PMESII-PT spectrum. Although authors of FM 3-0 do not explicitly illustrate this variable's close relationship to other sub-components, one can infer that the social aspects of a given environment will connect to other facets across the PMESII-PT spectrum.

For example, proposing that failed or flawed social assumptions can lead to military inefficiency or failure, Dr. Michael Vlahos, a senior staff member of the National Security Assessment team of John Hopkins University, wrote the following in an article regarding ongoing operations in Arab countries:

> The passion of it all obscures our essential opportunity: building relationships with the enemy. This is surely a daunting challenge. A non-state community is perfectly suited to fight as a people, where all take up the stress of the effort in some way. This convergence of willingness and availability permits the non-state community to shape its battle environment organically. But we could change that picture. We could engage them in ways that begin to deconstruct their "all against the stranger" existential reality. Unfortunately, our military culture is

[48]Ibid.

> simply incapable of this. We deploy a culturally ignorant battle element into their environment.[49]

Clearly, Vlahos advocated that friendly forces exhibit an understanding of the operational environment to then deconstruct the mindset of potential adversaries. In other words, an understanding of the "Social" aspect within the PMESII-PT methodology could have an impact on the enemy represented in the "Military" component. This paper will address socially related variables in more depth but for now it will suffice to outline its inclusion in FM 3-0 and its direct correlation to almost every other sub component within the PMESII-PT construct.

FM 3-0 authors defined the "Information," the fifth variable in PMESII-PT, as "…the aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information."[50] According to this definition, military leaders can identify media organizations and telecommunication networks as critical to this sub-component. In the context of a Muslim environment, Vlahos explained how this particular facet of PMESII-PT especially relates to the "Social" and "Military" variables. In describing the command and control networks and surveillance capacities of Islamic extremists, Vlahos contended "[e]verywhere our cherished high-tech is their cathartic enabler."[51] From cell phone use to internet exploitation, Muslim fighters spread propaganda through social networks, promote their agenda on the internet, and even execute complex attacks using information based resources.[52]

Authors of FM 3-0 described "Infrastructure," the sixth variable in PMESII-PT, as the "…basic facilities, services, and installations needed for a society's functioning."[53] In addition to

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[49]Michael Vlahos, "Fighting Identity: Why We Are Losing Our Wars," *Military Review* (November-December 2007), 5.

[50]FM 3-0, 1-8.

[51]Vlahos., 6.

[52]For additional resources on terrorists' exploitation of technology and information see *Understanding Terror Networks* by Marc Sageman or an article "Behind the Curve: Globalization and International Terrorism" in *International Security* by Audrey K. Cronin.

[53]FM 3-0, 1-8.

water, sewage, and electric facilities, this category also includes bridges, intersections, and even mosques since people view the religious sites as critical installations in many parts of the Arab world.[54] Again, although not explicitly explained in the context of other variables, military planners can expose such interrelatedness. Within an Arab society, mosques as infrastructures also have social, military, and political implications. In an interview with one local man in Baghdad during a U.S. military raid inside a mosque in 2004, the enraged Iraqi citizen stated, "They are searching for a killer in the mosque. But they want to destroy every holy place in my country."[55] Despite the man's acknowledgement of the U.S. military's intended mission within the holy shrine, one can detect resentment, distain, and severe mistrust. Thus, an observer can readily see interrelated connections throughout the PMESII-PT construct. A planner can annotate the Iraqi citizen's sentiments in the "Social" category. Under the "Infrastructure" category, a planner can capture the significance of mosques in an Arab environment. Finally, under the "Military" category, a planner can also relate socially unacceptable actions in mosques to potential militia activity.

In FM 3-0, doctrine writers presented the "Physical Environment" and "Time" as the seventh and eighth variables within PMESII-PT respectively. Writing with consideration to the military relevancy of these factors, authors illustrated the connection between timing, topographic, climate, and environmental features associated with the conduct of military operations. However, in addition to military implications, an observer can notice economic and

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[54]"Money as a Weapon," The Washington Post, entry posted January, 2008, http://projects.washingtonpost.com/2008/iraq-cerp/search/?terms=mosque (accessed March 15, 2010). This website has a "…database that contains records of each project of the Commander's Emergency Response Program recorded in the Iraq Reconstruction Management System, obtained through Army Corps of Engineers in response to a Freedom of Information Act request. The records are presented in their raw form, with no changes made by The Washington Post." For purposes of this paper, the reader should note that security payments were made to Arab personnel to protect mosques which were regarded as "critical infrastructure" throughout the entire database.

[55]Dahr Jamail, "U.S. Military Raids Baghdad Mosque, Enraging Sunni Muslims," TheNewStandard.net, May 15, 2004, http://newstandard news.net/content/index.cfm/items/347 (accessed March 15, 2010).

infrastructure correlations as well. A country's natural resources and their overall ability to distribute such resources can significantly influence the operational environment. Lionel Beehner, a contributor to the Council on Foreign Relations, drew such parallels between the physical environment, time, social unrest, and economic considerations:

> Three years after the fall of Saddam Hussein, many Iraqis still lack basic amenities like potable water, regularly endure power outages, and have yet to fully benefit from their country's immense wealth…With triple digit temperatures fast approaching, "the amount of electricity has to improve for people to survive," said Iraqi Foreign Minister Hoshyar Zebari in a June 16 CFR meeting. Although security remains Iraqi's foremost concern, one out of every three Iraqis say restoring infrastructure-not job creation, amending the constitution, or expelling U.S. troops-should be the government's top priority…[56]

Rephrasing Beehner's account, one can notice the interrelatedness with respect to all other PMESII-PT variables. According to the author's observations, the deteriorating *physical environment* over *time* and desperate need for improved *infrastructure* contrasted sharply with the *economic* potential of Iraq. Yet, despite the miserable conditions, the *social* mindset of the people still demanded that the Iraqi government's priorities be focused on the expulsion of U.S. troops from the country. Based on such a statement, military planners can make obvious connections between multiple variables within PMESII-PT.

From these examples, although limited in scope, one can at least better understand the basics and inherent nature of a military planner's analysis and subsequent application of the PMESII-PT construct. Rather than defining each component of PMESII-PT in greater detail, this paper has outlined the methodology's overarching use and the type of information commonly used to populate the tool. In the doctrinal definition of PMESII-PT, FM 3-0 authors reveal linear traits. FM 3-0 does not always require users to define components of the model in the context of other tenets. While this alone could potentially lead users to compartmentalize information, for the purposes of this paper, one can conclude that PMESII-PT designers intended the model to

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[56]Lionel Beehner, "Iraq's Faltering Infrastructure," Council on Foreign Relations Report, entry posted June 22, 2006, http://www.cfr.org/publication/10971/ (accessed March 15, 2010).

serve as a comprehensive assessment of an operational environment. A graphical summary of PMESII-PT (see Figure 1) will illustrate the necessity to analyze the interconnectedness of all the sub-components in the context of each other. Mr. Mark DeMike, the former deputy chief of the PMESII Division of the Battle Command Training Center in Fort Leavenworth, Kansas, wrote an article on the PMESII model heralding it as a tool for "[c]ommanders to better understand the impact and potential outcome of their actions, and other influences, on the Operational Environment."[57] DeMike clearly regarded PMESII-PT as a means to assess "...critical inter-relationships between systems [one] may face in the execution of any operation."[58]

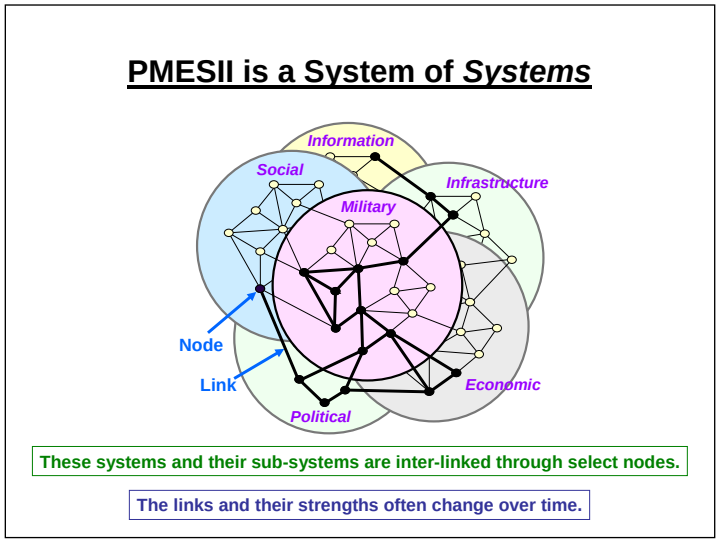

Figure 1:PMESII-PT as a System of Systems

A military commander can certainly ascertain a better understanding of a complex environment using PMESII-PT; however, one must now determine the depth and utility of such revelations. Although an assessment using PMESII-PT is seemingly *comprehensive*, the hypothesis of this paper challenges whether such a model is holistically *complete* to understanding complex social systems. In order to ultimately answer this monograph's primary

[57]Mark Demike, "PMESII-PT: A System of Systems." Production of the PMESII Division, Battle Command Training Center, Fort Leavenworth, KS, 2008, 1.

[58]Ibid., 7.

research question, what is the utility of applying a linear concept like PMESII-PT to an operational environment that is holistically asymmetric, this paper will now outline other methods used to define the Muslim world. In doing so, a reader can then compare and contrast the results of a PMESII-PT-based analysis to the results of approaches used in the past to understand complex environments.

Defining an Arab or Muslim Environment: Ghosts of the Past Resort to Holistic Methods

To distinguish between PMESII-PT, this paper will present holistic approaches previously used to define an operational environment within the Arab-Muslim world. The author of this monograph selected three different perspectives analyzing relatively the same complex environment in order to ensure accuracy and legitimacy of follow on analysis. By maintaining the complex Muslim-Arab context as a constant, the author can use three diverse perspectives to demonstrate how each used a different holistic approach to achieve remarkably similar conclusions. First, this monograph will use writings by Muslim scholars who explained Muslim environments. Second, this paper will use a Jewish author who explained an Arab environment. Finally, this paper will use primary source historical documents written during President Eisenhower's administration to explain environments within the Arab world. Prior to the advent of PMESII-PT, these authors used differing holistic approaches to draw conclusions about a comparable complex social system. Beyond noticing the similarity among their approaches and their content, a reader can compare and contrast these holistic methods to a PMESII-PT-derived description. Muslim scholars, other experts, and past U.S. officials chose holistic forms of inquiry to understand a complex environment. Rather than attempting to break the complex system into various preordained components, like PMESII-PT, authors seemed to work more in the abstract. Rather than seeking quantifiable data to feed into a linear methodology, users of holistic approaches sought a higher level of meaning.

Authors of holistic approaches better defined the organizing principles or "…subset of cultural codes responsible for regenerating the existing order…" within Arab or Muslim societies.[59] Without delving into the details of an environment using a classification-based method, these authors depicted a hidden hand which readers could then use to make inferences. In *Systems Thinking: Managing Chaos and Complexity*, Jamshid Gharajedaghi explained this concept as the second-order machine which subtly lies beneath the surface of a system or environment yet drives the nature of almost all interactions. To identify the hidden hand within environments, holistic approaches must go beyond the quantifiable and observable in order to discover the essence of actions rather than the actions themselves.[60] In *The Hidden Connections*, Fritjof Capra, a prolific author and expert on systems thinking, made a related argument by stating that "[t]he organizing activity of living systems, at all levels of life, is a mental activity… [and the] interactions of a living system with its environment are cognitive interactions."[61] Thus, regardless of efforts to identify political or social actions and interactions within an environment, the only way to truly discover meaning is through an understanding of the mental activity or the second order machine. In this sense, the observable actions, of which PMESII-PT captures, are essentially irrelevant.

[59]Gharajedaghi, 122.

[60]In *Autopoiesis and Cognition: The Realization of the Living*, Humberto Maturana and F. J. Varela also contended that cognition and life are intertwined and that a living system or environment can only be understood through a cultural-biological approach rather than a simple observation of actions.

[61]Frijotf Capra, *The Hidden Connections* (New York, NY: Doubleday, a division of Random House, Inc., 2002), 34.

First Holistic Approach: Muslims Writing about Muslims – Authors Majid Khadduri and BG S.K Malik

Writing on Islamic Law well before most contemporary Muslim scholars, Majid Khadduri earned a reputation as the foremost expert in Muslim affairs.[62] Khadduri defined Muslim society in the context of both the individual and the state through a predominantly Qur'anic perspective. Khadduri recognized the Qur'an as the driving cultural factor within Muslim society. Intertwined in his writings are military, social, political, and economic concepts but none are explored independently from Khadduri's overall presentation of Muslim society as a manifestation of the teachings within the Qur'an. Khadduri posited that Muslims view society "…as indispensible for the survival of man…," but also unable to "…survive without authority."[63] Khadduri stated that the Muslim community, unique from other societies, defines the state rather than the state serving as a means to define society. Government leaders serve merely as representatives to preserve and protect the society in accordance with Islamic directives. In this sense, social polity "…was made on the basis of a compact of agreement, being understood that this agreement was by no means between equals…[but rather]…a compact of submission, which reflects the nature of Allah's covenant with man."[64]

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[62]Andrew I. Killgore, "Professor Majid Khadduri,"*Washington Report on Middle East Affairs* (July 1996): 23. Majid Khadduri is a prolific author and highly respected Muslim intellectual who taught at several U.S. academic institutions including John Hopkins University. "With the unique perspectives of a man who was born in the dying days of the Ottoman Empire, matured in the new Middle East that emerged between the wars, and then became an active participant in the birth of the U.N. and the development of America's relationships with more than two dozen resurgent Middle Eastern countries, he has become the grand old man among Middle East experts in the nation's capital." The author of this monograph selected Khadduri for several reasons. First, Khadduri was considered an expert in Muslim traditions. Second, he was a Muslim author so his perspective was different than others. Finally, Khadduri chose a slightly different environment to assess. Khadduri analyzed the Muslim world, as opposed to the Arab world, and consequently allowed the author of this monograph to see if such a difference would dramatically impact Khadduri's approach, his conclusions, or both as compared to the other authors.

[63]Majid Khadduri, *War and Peace in the Law of Islam* (Baltimore, MD: The John Hopkins Press, 1955), 5.

[64]Ibid., 8.

Further exploring politically and socially oriented concepts within Muslim society in the context of the Qu'ran, Khadduri introduced the idea of Islamic nomocracy. Khadduri posited that Muslims view mankind as "…one supra-national community bound by one law and governed by one ruler."[65] Consequently, Muslims fundamentally differ from Christians in that the "…nature of such a [Muslim] state is entirely exclusive; does not recognize, by definition, the co-existence of a second universal state."[66] In other words, while Islam could tolerate other religions, two fundamentally different societies could not possibly co-exist peacefully.[67] Furthermore, in contrast to Western societies which tend to separate notions of church and state, the caliph in Muslim traditions serves as "…both pope and emperor, whose chief functions were the universalization of Islam and the enforcement of the divine law."[68] In contrast to the divine ordinances keeping Muslim society together, "[t]he most distinctive feature of this society was the lack of political unity, [which was] a characteristic feature in all tribal organizations."[69] Unlike Western notions of politics, Khadurri explained political decisions as worldly, nominal actions since the Qur'an instead "…provided a detailed account of everything."[70]

Muslim authors explained military related notions in the context of the Qur'an as well. Since the political and social state of Muslim communities "…refused to recognize the co-existence of non-Muslim communities…," the application of military might "…was therefore employed as an instrument for both the universalization of religion and the establishment of an

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[65]Ibid., 17.

[66]Ibid.

[67]Bernard Lewis, *The Political Language of Islam* (Chicago, IL: The University of Chicago Press, 1988), 2. In *The Political Language of Islam*, Bernard Lewis outlined a similar argument as Khadduri regarding the nature of the Islamic political environment by stating "[i]n classical Islam, there was no distinction between Church and state. In Christendom, the existence of two authorities goes back to the founder [Jesus], who enjoined [H]is followers to render unto Caesar the things which are Caesar's and to God the things which are God's."

[68]Ibid., 18.

[69]Ibid., 20.

[70]Ibid., 19.

imperial world state."[71] General S.K. Malik, a retired Pakistani Brigadier General and author of *The Qur'anic Concept of War*, implied even in the title of his work that the Qur'an serves as the basis for all military action in Muslim societies.[72] Both Malik and Khadduri described the world, according to Muslim tradition, as being one house divided into two camps – *Darus Salam* and *Darul Harb*. These ideas can be loosely translated to mean regions of believers and non-believers or, more directly, the house of peace and the house of war. All wars in the theory of Islamic law "…are in the nature of an undertaking to advance God's purposes on earth."[73] Military efforts, when considered in a purely Muslim context, are nothing more than efforts to protect and expand Muslim territories in accordance with Qur'anic directives.[74] Consequently, Malik described Jihad as a "…continuous and never ending struggle waged on all fronts including political, economic, social, psychological, domestic, moral, and spiritual to attain the object of policy."[75]

Although traditional Arab writers, like Khadurri and Malik, seemed to address in less detail economic and infrastructure facets of Muslim society, many traditional authors explain such notions, once again, in the context of the Qur'an.[76] Ownership of economic capital and

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[71]Ibid., 51.

[72]The author of this monograph chose S.K. Malik for several reasons. First, he reinforced Khadduri as another Muslim author assessing the same complex Muslim environment as Khadduri. Second, Malik had a lot less exposure to Western culture than Khadduri. This could allow the author of the monograph to compare his approach and conclusions to Khadduri's. Finally, many Muslim soldiers or fighters refer to Malik's book as the way all Muslims should engage in conflict. This fact added to his legitimacy as a source.

[73]S.K. Malik, *The Quranic Concept of War* (Delhi: Adam Publishers and Distributors, 1992), Preface, 7.

[74]Abdulaziz Abdulhussein Sachedina, *The Islamic Roots of Democratic Pluralism* (New York, NY: Oxford University Press, 2001), 115. In *The Islamic Roots of Democratic Pluralism,* Sachedina supported Malik's writings on the nature of Islamic warfare by stating "[i]n the historical development of the relationship between Islam and power, Muslim jurists…maintained that fighting was obligatory for Muslims even when the unbelievers had not initiated hostilities." Although Sachedina contended that the original purpose of Islamic warfare was only for defensive measures, all authors ultimately conclude that the Qur'an serves as the basis for military action.

[75]Ibid., 54.

[76]Sachedina, 48. For additional Islam-based economic policy, readers can reference *The Islamic Roots of Democratic Pluralism* by Abdulaziz Sachedina. For example, the author stated that during

property "…under the general principles of Muslim law is acquired either by *ihraz,* that is, taking possession of things in the state of nature… [or by] *naql*…the transfer of property from one person to another …or by inheritance."[77] As early as 624 A.D., quarrels over economic disparity were decided by divine legislation rather than any form of tribal or governmental edict: ". . . when ye have taken any booty, one-fifth belongs to Allah and to the Apostle, and to near kin, and to orphans, and to the wayfarer…"[78] Furthermore, during armed conflict, Muslim scholars described other Islamic traditions including the division of spoils in war, the timing of all distributions, policy towards immovable property, and even guidance on slavery.[79]

Using holistic approaches to describe Muslim environments, Muslim authors referenced the Qur'an as the hidden hand operating beneath the surface and driving observable actions across the PMESII-PT spectrum. In their analysis, one can realize how this second order machine holistically defined the environment by illustrating concepts with political, social, military, economic, and other implications. Although no academic writing on Muslim affairs rejected entirely the Qur'an's influence, some presented a more contemporary approach to describing Muslim environments through a different second order machine described simply as the Arab mindset.

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peaceful times "…it was permissible to collect tribute before [a non-Muslim] submitted to Muslim authority while he was unable to protect himself."

[77]Khadduri, 118.

[78]Ibid., 121.

[79]Ibid., 132.

Second Holistic Approach: "Outsider" Raphael Patai – A Different Audience, a Different Author, but a Familiar Holistic Approach

Raphael Patai, a prominent social anthropologist and prolific author, wrote a controversial book entitled *The Arab Mind*.[80] Critics have lambasted Patai's ethnographic work as insensitive, prejudice, and "…a thoroughly discredited form of scholarship."[81] In light of such accusations, this paper will analyze the methodology of the document rather than its content. Of interest to this paper, Patai did not utilize the Qur'an as an overarching means to illustrate Muslim society. Rather, the author instead selected another ontological concept, the mind of the Arab, to convey meaning and understanding of the Arab World.

In defense of using a such abstract ontological approach, such as the Arab mind, to then draw conclusions about a particular group, Patai posited that "…abstractions that we do venture (about either body or mind) are reached by processes of generalization."[82] Likewise, when a researcher "…ventures a statement about a certain mental characteristic of any human group, one inevitably generalizes as well as abstracts..." about a society or a "sociocultural milieu."[83] Patai continued to then reference the works of anthropologist Ralph Linton and psychologist Abram Kardiner as the individuals who made "[o]ne of the earliest attempts to tackle the problem of the

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[80]The author of this monograph specifically chose Patai for several reasons. First, by not being a Muslim, Patai could offer a very distinct perspective that added to the diversity of the selected holistic approaches. Second, although similar in many regards, Patai focused on a slightly different population. Rather than seeking meaning from the Muslim world, Patai sought to understand the Arab world. This allowed the author of the monograph to identify any dramatic shifts in understanding or meaning when compared to other authors. Finally, Patai used a somewhat controversial ontological method, ethnography, as the basis for his holistic approach. This allowed the author to compare and contrast distinct holistic methodologies and the conclusions such approaches ascertained.

[81]Brian Whitaker, "'Its best use is as a doorstop'," Guardian.co.uk, entry posted May 24, 2004, http://www.guardian.co.uk/world/2004/may/24/worlddispatch.usa (accessed March 15, 2010). Mr. Whitaker has been the senior editor for the Middle East at Guardian Magazine. He is also an author of several books dealing with the Arab culture including *What's Really Wrong with the Middle East* and *The Birth of Modern Yemen*. Whitaker also mentioned in the article another critic of Patai, namely, Seymour Hersh who is a writer for New Yorker magazine.

[82]Raphael Patai, *The Arab Mind* (Long Island City: The Hatherleigh Press, 1983),16

[83]Ibid., 17.

individual and his sociocultural background…"[84] These authors introduced the notion of basic personality types which are derived from cultural backgrounds.[85] Linton and Kardiner concluded that most members of a society share basic personality types which originate from early influences and are subsequently imprinted on the society as a whole. More importantly, and most applicable to this paper's research, the authors concluded that overarching personality types "…do not correspond to the total personality of the individual but rather to the projective systems which are basic to the individual's personality configuration."[86] In other words, an observer of a society can infer legitimate observations about a complex social environment through an approach which emphasizes the broader context of the surroundings. Based on such conclusions, Patai defended his methodology of using an abstract and ontological concept, like the Arab mind, to then explore more concrete attributes or explain particular behavior of a given Arab environment.

Patai contended that the substratum of the Arab mind is comprised of a heavy Bedouin influence. Although Bedouins within the Arab World "…constitute probably not more than 10 percent of the population…," a significant portion of the Arab people "…still considers the

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[84]Ibid.

[85]Ibid. Patai justified his abstract methodology by stating "Linton and Kardiner provide the following logic to justify their conclusions that society imprints a basic personality type on individuals. 1. That the individual's early experiences exert a lasting effect upon his personality, especially upon the development of his projective systems. 2. That similar experiences will tend to produce similar personality configurations in the individuals who are subjected to them. 3. That the techniques which the members of any society employ in the care and rearing of children are culturally patterned and will tend to be similar, although never identical, for various families within society. 4. That the culturally patterned techniques for the care and rearing of children differ from one society to another

If these postulates are correct, and they seemed to be supported by a wealth of evidence, it follows: 1. That members of any given society will have many elements of early experience in common. 2. That as a result of this they will have many elements of personality in common. 3. That since the early experience of individuals differs from one society to another, the personality norms for various societies will also differ."

[86]Ralph Linton, et al., *The Psychological Frontiers of Society* (New York, NY: Columbia University Press, 1945), 131.

Bedouin ethos as an ideal to which, in theory at least, it would like to measure up."[87] Patai outlined first the deep historical underpinning of the Bedouin culture. For example, the author stated that in previous generations, Muslim jurists in the Arab world making "…legal decisions relied heavily on Bedouin precedents…" and Arabic intellectuals referenced "…Bedouin usage in deciding on fine points of grammar."[88] Next, Patai highlighted several manifestations, noticeable even today, of the preeminence of the Bedouin influence upon the Arab mind. Patai attributed aspects of Arab hospitality, aversion to physical labor, honor, and self respect to the Bedouin ancestors of the Arab people.[89] Finally, Patai provided another layer of analysis in an attempt to get at an essential quality of the Arab environment. Patai contended that the Arab mindset across the social, economic, political, and military spectrum (PMESII-PT) is characterized by a concept the author dubbed "activity-passivity."[90]

According to Patai, "[t]he typical Bedouin's life alternates between relatively long periods of passivity…and brief spurts of frantic activity..."[91] Consequently, due to its Bedouin influence, the Arab mind "…is characterized by sudden flare-ups, which can easily lead to violence and even murder, followed by remorse and long periods of tranquility, inactivity, almost apathy."[92] Patai continued that such sporadic outbursts "…cause only a momentary flurry, since everybody knows they mean nothing serious, and that even the flow of give-and-take will return

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[87]Patai, 78.

[88]Ibid., 80.

[89]In *The Geography of Thought*, Richard Nisbett made a similar argument regarding the impact of landscape on the observable behavior of Eastern and Western cultures. Similarly, Patai often referenced the influence of Arab geography, namely the desert, on the Bedouin mind and, subsequently, the overarching Arab mindset.

[90]George Antonius, *The Arab Awakening* (Philadelphia, PA: J. B. Lippincott, 1939), 89. For further reading on the activity-passivity traits of the Arab mind, a reader can consult *The Arab Awakening* by George Antonius who also observed "…intermittent and violent explosions interspersed with periods of repose and inactivity…"

[91]Patai, 87.

[92]Ibid.

after what normally proves to be a short interruption."[93] Patai then concluded that this mindset permeates through all aspects of Arab environment (PMESII-PT) and to truly understand the "…social order, economic structure, and political life…" of the Arab world, one must first grasp the phenomenon of "sudden, sporadic advances followed by periods of quiescence in which what was achieved in the brief stage of activity either gradually erodes or becomes set in a new pattern of tradition."[94]

Despite whether Patai's assertions are correct, the purpose of presenting his argument to the reader is to elucidate his methodology. First, Patai outlined his basis for using abstract generalities to describe an environment. Second, Patai presented the historical underpinnings, the Bedouin culture, as the primary influence to the Arab mindset. Third, the author used the Arab mind to then illustrate more quantifiable, and easily recognizable, traits of the Arab people. Finally, Patai attempted to dig deeper until he settled on a concept, like activity passivity, which he felt defined the Arab mind and, subsequently, the second order machine. Critics of Patai's work contended that the author inappropriately justified Arab stereotypes and that his suppositions were outdated; however, none criticized his methodology of using general principles to explain particular behavior. For the purposes of this paper, readers should understand that Patai used a holistic methodology that started with the abstract and worked its way to the specific. Even a critic has to recognize that such a holistic approach does provide a rich depiction of the environment.

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[93]Ibid., 87- 88.

[94]Ibid, 88.

Third Holistic Approach: We Have Done This Before – President Eisenhower's Administration and Defining an Arab Environment

Prior to the advent of PMESII-PT, military planners and government officials were still faced with the challenge of defining and understanding the Arab world. During President Eisenhower's administration, many within the U.S. government were actively seeking methods to better understand Arab nations to prevent the spread of communism in the Middle East.[95] Since President Eisenhower made defining complex Arab systems a top priority, a researcher can gain useful insight by analyzing the approaches used by administration officials to accomplish presidential directives. Eisenhower's Psychological Strategy Board (PSB) served as a means to coordinate psychological operations initiated through various governmental agencies. By analyzing recently declassified Cold War documents detailing efforts to understand an Arab environment within the Middle East, one can discover a research approach that resembles previously outlined holistic methodologies in this paper. Over twenty years prior to Patai's original work, PSB officials authored a report with an in depth section coincidentally entitled "The Arab Mind" to provide "[a]n analysis of the thinking of [those within] the Middle East [which] is particularly necessary since the Arab mind…[is] substantially different from those to be met with in Europe or the U.S."[96] Although the entire annex covers a wide spectrum of ethnic groups and subcultures within the Middle East, the authors use the same general form of enquiry to drive their analysis.

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[95]The author of this monograph selected President Eisenhower's administration for analysis due to several reasons. First, members of his PSB defined similar environments as the other selected authors. Second, they provide a uniquely Occidental perspective to then compare and contrast to other authors. Third, the PSB faced a very similar challenge as U.S. officials today – to define a complex environment in order to ultimately leverage such an understanding to achieve other objectives.

[96]"Psychological Strategy Board," Annex B, Section 1a, Dwight D. Eisenhower Presidential Library, Abilene, KS, White House Office, NSC Staff Papers 1948-1961, NSC Registry Services 1947-1962, Box 16, Vol. III, Folder 8, 1.

Like Patai, authors of the PSB document began by explaining what amounts to a holistic approach to their research. Through an abstract exploration of the Arab mind, Eisenhower officials depicted Arab society to understand its' members worldview and to ultimately predict certain "reaction patterns" of the Arab populace towards certain policies.[97] Like other methods used to define the Arab world or operating environment, scholars employed by Eisenhower's administration explained political, social, economic, and military aspects of society through a holistic approach.[98] For example, touching on multiple aspects within PMESII-PT, PSB authors explained the following about Arabs living within complex environments:

> The Arab has traditionally thought of himself not as an individual but as a member of his immediate family or clan. Socially, therefore, his horizon has not extended beyond this range and his social aims have therefore been limited to increasing its wealth, defending its honor, supporting its religion by ostentatious observance of ceremonies, pilgrimages, and gifts to charity, and enhancing its social prestige by (1) honors received, (2) government employment, (3) political rank, (4) number of wives and (5) numerous children. The individual personality is therefore little more than a reflection of the personality of his clan or family.[99]

From reading this account, it is possible to identify primarily social tendencies of which have economic and even political ramifications. Subsequently, through an understanding of the Arab mind as presented in the PSB's report, a reader can extrapolate an even deeper understanding to better inform action. For example, as implied from the above extract, Eisenhower officials could assume nationalistic appeals to reject communism would fail since the Arab feels more aligned with familial and clan associations. However, by enabling Arab leaders financially, as an

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[97]Ibid.

[98]Glen Fisher, *The Mindsets Factor in Ethnic Conflict: A Cross-Cultural Agenda* (Yarmouth, ME: Intercultural Press, 1998), 56. In his work, Glen Fisher provided insight to external players responsible for overcoming conflict or reaching understanding in a different culture. Describing obstacles and objectives akin to Eisenhower's challenges and desired endstates in dealing with the Middle East, the author stated to "…anticipate intransigence, understand its sources and dynamics for the ethnic group in question, judge its firmness or malleability, and adapt one's strategy accordingly." Through the PSB, Eisenhower sought understanding of the Arab mind to be better enabled to influence the Middle East away from communism.

[99]"Psychological Strategy Board," Annex B, Section 1a, White House Office, NSC Staff Papers 1948-1961, Box 16, Vol. III, Folder 8, 2.

example, to defend the honor and prestige of Islam against communism, an outside actor might more effectively harness understanding of the Arab culture toward a much greater success.

Unlike Muslim scholars, such as Khadduri and Malik, U.S. officials on the PSB did not explicitly highlight the Qur'an as the second order machine or basis for all other actions across the PMESII-PT spectrum. Although PSB officials did, like Patai, suggest that the Arab mind was the primary influencer throughout all domains of Arab society, a subtle difference exists between the assertions of Patai and the PSB. Using a holistic approach, authors of the PSB re-emphasized a motif explored in other holistic methodologies: Observers of Arab environments must recognize the prevalence of spirituality and religious-based logic within the Arab mind. Whereas Patai suggested the Arab mind was largely based on a Bedouin influence, PSB officials contended that the Arab mind was based on Islam.

Using a holistic approach based on the Arab mind, driven by the tenets of Islam, PSB authors conveyed a deep understanding of the Arab environment. Not limited by a linear model or methodology, the PSB explained economic, social, military, and other tenets of the Arab world through this encompassing inquisitive approach. For example, authors on the PSB suggested that within an Arab context "[d]ifferences in social and economic positions have traditionally been accepted as inevitable and a product of the natural order of things created by divine will."[100] Furthermore, like other authors using holistic approaches, the PSB outlined that the military subjectation of Muslim society by a non-Muslim entity is inherently unacceptable under the laws of Islam and requires military action on behalf of all faithful Muslims. PSB authors even expanded on this notion and wrote that "rule and authority exercised by non-Muslims is regarded as unnatural and an indication that Islam is weakening and must gather its forces and counterattack to regain its ordained supremacy."[101] Throughout their assessment, PSB scholars

[100]Ibid., 4.

[101]Ibid., 5.

and psychologists explored a sundry of facets within Arab society through the prism of the Arab mind. Through this lens, President Eisenhower and others garnered a deep understanding of the Arab environment and tailored a strategic communication platform with special emphasis on religious factors.

From a consideration of these examples of holistic inquiries used by Muslim scholars, academic writers, and U.S. governmental officials to describe a relatively similar complex environment, this analysis can now further define holism and the unique insight holistic approaches offer. In the following section, the reader should gain an appreciation for holism and begin to understand the limitations of linear methodologies. To capture the essence of holistic approaches, this paper explores the facets of complex environments and explains how holistic approaches better address these characteristics to ultimately convey meaning.

Essence of Holism: Highlighting Differences among Approaches

The following section of this monograph addresses the heart of the primary research question: What is the utility of applying a linear concept like PMESII-PT to an operational environment that is holistically asymmetric? In order to compare and contrast the PMESII-PT methodology to holistic thinking, this paper will delve deeper into the essence of holism. Holistic approaches exhibit similar traits that one must analyze to not only discover how they convey meaning but to also delineate them from other methodologies like PMESII-PT. To guide analysis and precisely capture the utility of holistic explanations versus the futility of linear, descriptive approaches, one must turn to the foundational characteristics of complex systems. If complex environments exhibit core characteristics, then holistic approaches must somehow endeavor to explain such characteristics and their impact to ultimately convey meaning about the environment.

In describing his work to create a holistic approach that seeks to convey meaning of complexity, Gharajedaghi stated the following:

> The ideas [presented in] this book, although many, converge and create a whole that is profoundly more beautiful than any one concept in isolation. The real beauty, therefore, lies in experiencing the whole, seeing the concepts all fuse into one.[102]

Gharajedaghi suggested that five principles of openness, purposefulness, emergent property, multidimensionality, and counterintuitiveness "…acting together as an interactive whole, define the essential characteristics and assumptions about the behavior of an organization…"[103] Supposing the aforementioned characteristics quantify a complex environment, then any form of inquiry used to understand such environments should, at a minimum, be able to address such dynamics.[104] Using Gharajedaghi's precepts as a guide, one can not only further understand the essence of holistic approaches but begin to comprehend the shortcomings of PMESII-PT.

Openness: Out of Context = Out of Luck

Openness of complex systems refers to the fact that "…the behavior of living systems can only be understood in the context of their environment."[105] Clifford Geertz, a prominent ethnographer and author of *The Interpretation of Cultures*, reinforced this notion by suggesting that an individual can "…gain empirical access to…symbol systems…by inspecting events, not by arranging abstracted entities into unified patterns."[106] Geertz continued that "…coherence cannot be the major test of validity…" for cultural understanding.[107] Rather than separating and organizing data into a linear and coherent sequence like PMESII-PT, one must mitigate

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[102]Gharajedaghi, xvii.

[103]Ibid., 29.

[104]In *Seeing the Forest through the Trees: A Manager's Guide to Applying Systems Thinking* by Dennis Sherwood and *The System Thinking Approach to Strategic Planning and Management* by Stephen G. Haines highlighted similar characteristics of complex environments as Gharajedaghi. However, unlike Gharajedaghi, both authors defined in much less detail what makes an environment complex; their focus was more on applying systems thinking towards creating a business strategy.

[105]Gharajedaghi, 30.

[106]Clifford Geertz, "Thick Description: Toward an Interpretive Theory of Culture," in *The Interpretation of Culture*s (New York, NY: Basic Books, 1973), 17.

[107]Ibid.

underlying assumptions and analyze such concepts under their preexisting context or historical foundations. [108] To separate an observation from its context, "…is to divorce it from its applications and render it vacant."[109] Rather than separating the historical underpinnings of an analyzed event to categorize it into a model, observers of an environment must strive to carefully isolate the event while retaining its fullest meaning.

Likewise, users of a holistic approach conduct analysis "…from the direction of exceedingly extended acquaintances with extremely small matters."[110] Yet, those matters must still contain the requisite depth and meaning once isolated. With the openness of a complex system in mind, one can understand why holistic methods of inquiry preserve the cultural and historical foundations of observations in order to derive relevant meaning from the environments that they explain. In their holistic approaches, the Muslim scholars and President Eisenhower's staff revealed deep understanding through an in depth analysis of isolated, abstract, and yet central concepts within the observed system. Without being constrained by pre-established categories or with classifying data, authors relying on a holistic approach depicted in detail historically intact events that can appropriately convey meaning beyond the event itself. [111]

As an example, consider the following description from Majid Khadduri on how Muslims execute the law of peace and how such practices can potentially result in the gradual integration of Muslim areas into the world community:

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[108]Peter M. Senge, *The Fifth Discipline*, rev. ed. (New York, NY: Currency Books, published by Doubleday, a Division of Random House, 2006), 12. In *The Fifth Discipline*, Peter Senge discussed how systems thinking requires an "openness…to unearth shortcomings in our present ways of seeing the world." In writing about how to create learning organizations, Senge focused more on the ability of individual's to suspend assumptions and allow the openness of an environment to convey meaning whereas Gharajegaghi focused more on the openness of complex environments in and of themselves.

[109]Geertz, 18.

[110]Ibid., 21.

[111]Stephen G. Haines, *The Systems Thinking Approach to Strategic Planning and Management* (Boca Raton, FL: CRC Press LLC, 2000), 34. In this work, Stephen G. Haines also addressed the openness of complex systems and encouraged readers to consider components in their environment as opposed to in isolation.

> To sum up, the law of peace, like the jihad was in theory only a temporary device to regulate the relations of Muslims with the outside world during non-hostile periods (i.e. when the jihad was in suspense), until the *dar al Islam* should comprise the whole world. Nor did the peaceful relations between *dar al Islam* and *dar al harb*, which were often conducted on the basis of mutual respect and interest, carry with it in the implied idea of equality between the two *dars* . . . In practice, however, the more habituated the Muslims became to a dormant jihad, the more reconciled they tended to be to the permanency of a law of peace.[112]

In this rather abstract passage of an isolated concept, the law of peace, the author conveyed multiple ideas which elicit a rich understanding because the event is explained within its historical context. Through a cultural and historical appreciation for the origins of the Islamic law of peace, one can achieve a holistic appreciation of the overall system. Furthermore, observers can understand events, like an unexplained re-initiation of hostilities on behalf of an Arab enemy, with much greater depth. While PMESII-PT may illustrate the tendency for Muslim fighters to reengage in conflict once they garner the requisite materials, one can ascertain a more accurate depiction of the actions through a holistic approach which addresses the openness of the system. Although Muslim fighters may reengage and disengage continually, the impetus for their actions may not be materially based. Perhaps, their actions are rooted in deep cultural and historical obligations to "…have continuous patience for the continuation of fighting until victory is achieved however long it might take to reach that end."[113]

Purposefulness: The Why Under the Why Under the Why

When trying to ascertain meaning of complex systems, an observer must first realize that "[u]nderstanding is different from both information and knowledge. Information deals with the *what* questions, knowledge with the *how* question, and understanding with the *why* questions."[114] Consequently, any method of inquiry must determine beyond the facts the why or purpose for an

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[112]Khadduri, 145.

[113]Ibid., 133.

[114]Gharajedaghi, 33.

event, action, or interaction. Geertz reinforced this concept and suggested even "that what we call our data are really our own constructions of other people's constructions…"[115] The author used an illustrative example to make his point. If three individuals blink their eyes for different reasons, an outside observer may collectively classify the action inappropriately owing to a thin understanding or perhaps a fundamental misunderstanding of *why* the action occurred from the perspective of the observed individuals rather than from just the perspective of the observer. Consequently, one must then challenge any conclusions or interrelated concepts drawn thereafter from that particular data point. If the observer deduced at first that all the individuals blinked because something was in their eye, then the observer may inaccurately conclude that the three people need eye drops. Similarly, the tangible actions and thin observations which feed into the PMESII-PT construct may not be the result of a thick understanding and mislead users to draw inappropriate conclusions.

As mentioned earlier, holistic approaches to defining an environment, retain events in their context to convey meaning. In doing so, holistic approaches allow readers to understand another layer of why in order to address the purposefulness of the complex system. Holism thus provides an additional degree of understanding beyond mere observation and description. PMESII-PT would detect primarily observable behavior like actions that are the consequence of an Arab's notion of honor. Under PMESII-PT, the observation could be taken out of context and categorized under the "Social" category of the methodology. Furthermore, PMESII-PT users could then "connect" this notion of honor to other observable behavior throughout the PMESII-PT construct. For example, under the "Military" category, one may capture the fact that Arab soldiers exhibit a stronger sense of honor towards superiors from the same tribe. However, a layer of purposefulness seems missing. In *The Arab Mind*, Patai explained the observable behavior of honor using a holistic approach:

[115]Geertz, 9.

> [T]here is a strong correlation between honor and group survival. Honorable behavior is that which is conducive to group cohesion and group survival, that which strengthens the group and serves its interests; while shameful behavior is that which tends to disrupt, endanger, impair or weaken the social aggregate.[116]

From reading Patai's holistic account, a reader can understand the underlying reason for the action that goes beyond the action itself. In the context of Gaddis' example of the three blinking individuals, an observer can understand why each individual is blinking as opposed to merely capturing the fact that the individual is blinking. An Arab's sense of honor goes beyond mere observed behavior and is more purposefully explained as a means to retain collective strength.

Through a holistic approach that addresses the additional component of why, an observer can infer much more about an environment and capture its essence. By engaging in a continual cycle of learning, users of holistic forms of inquiry execute a perpetual cycle of "why-because" to uncover deeper and deeper layers of meaning, or the purposefulness, within an environment.[117] Those who rely on linear methods run the risk of separately classifying multiple observations with the same baseline logic while users of a holistic form of inquiry first capture the baseline logic, or purposefulness of the system, to then make informed inferences throughout analysis.

Emergent Property: In a League of Its Own

Many authors of systems thinking described emergence as a critical factor of complex systems.[118] An emergent characteristic is best described as a "…property of the whole, not [a] property of the parts, and [which] cannot be deduced from properties of the parts."[119] Rather,

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[116]Patai, 96.

[117]Similarly, in *The Fifth Discipline*, Peter Senge discussed how to create a learning organization which he described as an entity that perpetually endeavors to seek new understanding. To ascertain the purposefulness in a complex environment, leader must guide an organization to engage in a continual "why-because" cycle that seeks newer and deeper layers of understanding.

[118]Multiple authors define emergent properties in the same manner as Gharajedaghi and Gaddis. To conduct further research, consult *Making Things Work* by Yaneer Bar-Yam, *Harnessing Complexity* by Robert Axelrod and Michael Cohen, *Learning for Action* by Peter Checkland and John Poulter, and *The Scientific Way of Warfare* by Antoine J. Bousquet.

[119]Gharajedaghi, 46.

emergent properties arise from "…a product of the interactions, not a sum of the actions of the parts…"[120] Although many authors provided an explanation of emergent properties and their presence in complex systems, only a few explained how a form of inquiry must address the concept of emergence to capture meaning.[121] In *The Landscape of History,* Gaddis compared reductional and ecological approaches to gaining a better understanding of an event or culture. Reductionism implies that one can define independent variables in an assessment process. However, when dealing with complex environments, one "…can hardly break things up into their component parts, because so much depends on so much else."[122] On the contrary, an ecological approach "…also values the specification of simpler components…[but] it considers how the components interact to become systems whose nature cannot be defined merely by calculating the sum of their parts."[123] In other words, an ecological approach allows for "…fundamental particles, but seeks to place them within an equally fundamental universe."[124]

According to PMESII-PT advocates, the model represents the ecological approach just described. By inputting data and then correlating it in relation to the other components of PMESII-PT, users believe that one can achieve a higher degree of understanding. However, when complexity scientists and anthropologists further expound on emergence, one can identify a subtle, yet significant, shortcoming of the PMESII-PT model. Like Gaddis, Gharajedaghi

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[120]Ibid.

[121]Dennis Sherwood, *Seeing the Forest Through the Trees* (Yarmouth, ME: Nicholas Brealey Publishing, 2002), 14. In this book, Dennis Sherwood also explored the concept of emergence and self organization but falls short of providing insight as to how a form of inquiry must address the concept of emergence to capture meaning. He contended that a dynamic system may be comprised of parts but those parts cannot be assessed individually to truly understand the system. He used one example of a hurricane. The components of hurricane, like air and water, retain distinct characteristics but such characteristics have only limited utility in describing the dynamic of the hurricane itself. Although his explanation makes sense, one still wonders how to best capture emergence to ultimately convey meaning of complex systems.

[122]John Lewis Gaddis, *The Landscape of History: How Historians Map the Past* (New York, NY: Oxford University Press, 2002), 55.

[123]Ibid.

[124]Ibid.

suggested emergent qualities "…are a product of interactions, not a sum of the actions…"[125] The author continued to state that "[t]he compatibility between the parts and their reinforcing mutual interactions create a resonance, or force, which will be an order of magnitude higher than the sum of the forces generated by the separate parts."[126] Gharajedaghi then provided even greater insight into emergent properties which he suggested have "…to be understood on [their] own terms."[127] The author contended that emergent properties "…are the spontaneous outcome of ongoing processes…[and they]…cannot be measured directly."[128] Even if one could populate a PMESII-PT model with measurable observations, understanding "…is obscured because most of what we need to comprehend a particular event, ritual, custom, or idea is insinuated as background information before the thing itself is directly examined."[129] What Geertz described as "the thing," other ethnographers, scientists, and sociologists defined as emergent properties.

Again, as discussed earlier, by removing an event from its contextual background, one neglects a deeper level of analysis. Without this additional layer of why, an observer will simply classify the events as ends in of themselves. Users of PMESII-PT classify and relate events to each other but do not delve beyond the observable. By failing to notice that certain rituals or customs have the same underlying logic or rational, users of linear approaches miss the essence of the events. However, by capturing the underlying reasons for that particular event, an observer can then witness an emerging order. Essentially, users of holistic approaches can more readily identify emergent properties by examining both the openness and purposefulness of an environment. To better illustrate this point, one can consider Khadduri's holistic description of Arab hospitality:

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[125]Gharajedaghi, 46.

[126]Ibid., 47.

[127]Ibid., 46.

[128]Ibid., 47.

[129]Geertz, 9.

> It follows that the *sunna*, the common law of a primitive social order, developed in a loose political organization to supplement the benign authority of the chief as well as to temper the austere desert life which provides but meager resources for living. Thus, such customary practices of hospitality…to provide food, asylum, and assistance to helpless desert travelers.[130]

While a PMESII-PT methodology of defining an environment may highlight the hospitality of the Arab people, a holistic approach reveals a deeper understanding. Readers can connect the role of tribal leaders, the landscape of the desert, and even the application of tribal law with the observable behavior of hospitality. As users of holistic approaches continue to define the environment, perhaps the application of tribal law continues to emerge in analysis. Such an observation could possibly elucidate an emergent trend or even signal towards the second order machine of the environment. Rather than getting lost in inappropriately extracted and tangible observations, users of holistic approaches do not fall into "…the trap of trying to find correlations…[which] do not explain much about the essence of life."[131] To convey meaning of complex environments, a form of inquiry must address the emergence of the system by considering it separately and in its own league.

Multidimensionality: Inseparable Trios and Not Static Pairs

Multidimensionality is defined as "…the ability to see complementary relations in opposing tendencies and to create feasible wholes with unfeasible parts."[132] Furthermore, some authors even described multidimensionality as "…probably one of the most potent principles of systems thinking."[133] By encouraging discovery of interrelatedness within the various and opposing components of the PMESII-PT model, users can reveal how a system functions and interacts. However, Gharajedaghi expanded on multidimensionality by stating the concept also

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[130]Khadduri, 21.

[131]Gharajedaghi, 46.

[132]Ibid., 38.

[133]Ibid.

maintains that "…opposing tendencies not only coexist and interact, but also form a complementary relationship…not confined to pairs."[134] In this further description of multidimensionality, Gharajedaghi highlighted the limitations of PMESII-PT. Operating in only two dimensions, PMESII-PT can only statically pair an observation or input from the environment to a multitude of other observations. PMESII-PT depicts variables as either dichotomies or as a continuum in relation to each other. For example, using the linear methodology, observations from the environment "…are treated as dichotomies that are usually expressed as X or *Not* X."[135] Or, observations of the environment are inputted into the PMESII-PT model and treated as a "…give and take struggle" along a continuum where meaning is explained in terms of balance and compromise. [136] For example, one may describe an environment with people that exhibit apprehension towards too much individual freedom because such liberties could lead to anarchy. Therefore, using the PMESII-PT model to describe the environment, one can depict a relationship that involves a balance between freedom and anarchy.

However, complex environments contain multiple aspects which exhibit "[t]he mutual interdependence of opposing tendencies…characterized by an *and* instead of an *or* relationship."[137] Therefore, multidimensional systems have that additional dimension which a linear methodology cannot address. Essentially, certain observations of an environment should never be separated and compared in isolation of other factors. Rather, an observer must execute analysis only in a collective and three-dimensional manner. In considering the trio of freedom, justice, and security, one can better understand how linear methodologies fail to capture the multidimensional aspects of complex environments:

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[134]Ibid., 39.

[135]Ibid., 38.

[136]Ibid., 39.

[137]Ibid., 39.

> …[S]ome are afraid of freedom, seeing always behind it the specter of anarchy. Whereas some others are afraid of justice seeing always behind it the specter of tyranny. Furthermore, consider the relationship between security and freedom. One cannot be free if one is not secure. Maybe freedom, justice, and security are three aspects of the same thing and were not meant to be separated in the first place. Certainly, treating them in isolation has been problematic.[138]

While PMESII-PT may notice the relationship of these concepts (freedom, justice, and security), the linearity of the model prevents a greater multidimensional understanding. However, a holistic explanation of the freedom, justice, and security trio will lead to a more complete understanding because the dimensions are explained only in context of each other. Using a holistic approach, an analyst can convey understanding of freedom in the context of freedom itself; in the context of freedom and justice; in the context of freedom and security; and in the context of freedom, justice, and security.

Like Gharajedaghi, George Kelly, a renowned psychologist, explored dichotomies and laid the foundational basis for cognitive constructivism or how an observer learns about a system. In his analysis, Kelly admitted that observers will tend to identify "X or *Not* X" type relationships when learning about an environment. However, he also suggested that "…the differences expressed by a construct are just as relevant as the likeness."[139] Therefore, the author implied that a dichotomous relationship alone does not suffice in understanding a system and that observers must see "…polar divergence as related but yet distinct or…as trinities rather than just one or two distinct elements."[140] In "The New Agenda of Praxis," a paper written for the Praxis Company, Zvi Lanir and Gad Sneh, enterprising research strategists, expanded on Kelly's assertions and provided a new mental construct to address the multidimensionality of complex environments. Lanir and Sneh stated that since "Kelly intuitively realized the dichotomous element…should be

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[138]Ibid.

[139]George Kelly, *The Psychology of Personal Constructs* (New York, NY: W.W. Norton, 1955), 65.

[140]Zvi Lanir and Gad Sneh, *The New Agenda of Praxis* (Tel Aviv, Israel: Praxis Lanir-Decision and Learning Systems, 2000), 21.

similar to and at the same time different from other elements…, we claim that we must strive to reconstruct the holistic nature of mental constructs."[141] In an attempt to capture another reality of multidimensionality, Lanir and Sneh introduced the concept of complementary divergence which avoided "…reductionism in the methodological sense that a phenomenon of interest is best addressed by breaking it down into its constituents."[142] Rather, the authors suggested, like Gharajedaghi, that observers should approach complex environments "…in their totality, complexity, and dynamics."[143]

While further explaining multidimensionality, Gharajedaghi also contended that "[p]lurality of structure, function, and process…is at the core of systems theory of development… [and] it denies the classical view of a single structure with a single function in a single cause-and-effect relationship."[144] Although users of PMESII-PT may reveal multiple interrelated connections among various functions, users are limited by the model when capturing plurality in structure. As an example, PMESII-PT may illustrate the multiple functions of an artifact like a mosque in the Muslim world and also conclude that mosques can have a resounding sentimental value. The centers of worship can serve as a social venue, a place to promulgate political messages, or even as a refuge for insurgents taking advantage of U.S. Rules of Engagement (R.O.E.) to not enter the holy sites.

PMESII-PT users may conclude that the places of worship retain social, political, and even military implications. However, users of the linear methodology may have trouble explaining why "…actors may cooperate on one pair of tendencies, compete over others, and be in conflict over different sets, all at the same time."[145] Using PMESII-PT, one may fail to capture

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[141]Ibid.

[142]Ibid.

[143]Ibid.

[144]Gharajedaghi, 43.

[145]Ibid., 44.

scale of the actors in relation to each other.[146] In other words, a user may not understand which relationship is more or less important because they all look the same. Thus, users of a linear methodology cannot prioritize what they see. In *The Landscape of History*, John Lewis Gaddis, noted historian, expounded on the notion of scale by stating that in order to better understand an environment, holistic observers "…can shift the scale from the macroscopic to the microscopic, and back again."[147] In his definition, Gaddis highlighted the weakness of PMESII-PT where users cannot shift back and forth. The static micro observations do not form a relationship with the overarching macro conclusions.[148]

If insurgents do in fact exploit a mosque to hide, how does PMESII-PT lead to a level of understanding which can then inform action? Only through a holistic understanding can one conclude that the social implications regarding the mosque, like its resounding sentimental weight, exceed in value its use as an illegal military haven. Thus, U.S. military forces could then better inform their actions in the macro sense. To illustrate the greater propensity of a holistic approach to capture the multidimensionality of given environment, one can consider the following extract from the PSB report:

> The present [Arab] ruling groups are reluctant to take the initiative in leading the transition from the disintegrating security of traditional allegiances – intra-

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[146]Yaneer Bar-Yam, *Making Things Work: Solving Complex Problems in a Complex World* (Massachusetts: NECSI Knowledge Press, 2004), 262. In his book, Bar Yam Yaneer also explored the notion of scale in complex environments. The author stated that "…the first step in solving a complex problem is to develop an understanding of the complexity profile of the system: the way that scale and complexity exist in the tasks that need to be done. This may be summarized by identifying the complexity at each scale. The complexity profile captures the degree to which actions of the system are (or need to be) repetitive, and to what degree that need to act in response to local conditions at different places, or over time to different instances."

[147]Gaddis, 25.

[148]Ibid. Also, William H. McNeill's *The Rise of the West* was used to illustrate the power of shifting from the micro to the macro and vice versa. McNeill produced "…a series of books that start from microscopic insights into human nature but then expand them into macroscopic reinterpretations of an extended past." Although PMESII-PT can capture details of an environment, users do not shift back and forth from the micro to the macro. By not moving between the micro and macro and by pulling the micro out of context as discussed earlier, users of PMESII-PT never develop the micro-macro complementary relationship which addresses, among other things, the multidimensionality of the system.

> regional, family, village, and tribal – to a more solid foundation of society. Despite growing pressures…for reform, [the Arab leaders'] advocacy of reform is largely perfunctory, since its implementation would weaken their own political position and economic interest.[149]

Employing a PMESII-PT analysis, one may conclude that Arab leaders are resistant to change and will give only superficial support for reform. However, as actors change in a multidimensional environment, the fundamental nature of the preexisting relationships between them will morph as well. For example, in their conclusions, PSB officials stated that "…there is a tendency towards opportunism with respect to the Soviet Union…leaders display a disposition to flirt with the communists in an effort to attain power."[150] Therefore, users of a holistic approach can broadly understand that, to leverage reform, an external player may need to associate progress with increased power and prestige for the Arab leaders.

Using a linear method, observers may myopically and incorrectly conclude that the exact methods used by the Soviets to gain influence must be replicated to achieve success. They may miss the fact that power, not an aversion to change, serves as the real impetus for Arab resistance towards reform. Additionally, by manipulating this notion of power, one can ignite a desire for change regardless of the methods used. By operating deeper than mere observations, users of holistic approaches retain more of a predicative capacity. Holism necessarily forces observers to maintain a strategic and broad focus in order to offer a much wider range of possible approaches. To avoid a mischaracterization of a system, an analyst must use a holistic approach that can address the multidimensionality of the social environment.

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[149]"Psychological Strategy Board," Annex B, Section 1a, White House Office, NSC Staff Papers 1948-1961, Box 16, Vol. III, Folder 8, 14.

[150]Ibid.

Counterintuitiveness: 1 + 1 = 3!

The essence of counterintuitiveness within complex systems is that "…actions intended to produce a desired outcome may, in fact, generate opposite results."[151] In *Making Things Work*, Yaneer Bar Yam presented this concept through his presentation of the counterintuitive nature of sports teams in regard to cooperation and competition. Every sports team has within it a mixture of selfish players and team players at the individual level. Obviously, any coach would want cooperation at the individual level to enable competition at the team level. Acting in a counterintuitive manner, Bar-Yam stated "…[c]ooperation at the level of the individual enables effective competition at the level of the group, and conversely the competition between teams motivates cooperation between players."[152] If an outside actor took actions to mitigate the competitive edge of the players on the team to prevent infighting, the impact could have a reverse effect. Without the desire to compete, the team may perform worse against other teams despite improving internally. Echoing Bar-Yam's comments, Gaddis explained that "…when predictable processes come together in unprecedented ways, unpredictable consequences can follow."[153]

In Gharajedaghi's analysis, the author then suggested that "…unpredictability of non linear systems parallels counterintuitive behavior in a social context...[and] an interesting formulation known as chaos theory…provides and alternative insight into the nature of this phenomenon."[154] Using chaos theory in the context of social systems, observers have "…the basic tools and concepts needed to understand choice and why social systems do what they do."[155] Rather than perpetuating misinformation through "…the fallacy of generating simple correlation," as would a linear methodology, the author contended that "[a]nalyzing the behavior

[151]Gharajedaghi, 49.

[152]Bar-Yam, 80-81.

[153]Gaddis, 31.

[154]Gharajedaghi, 51.

[155]Ibid.

of a nonlinear system is like walking through a maze whose walls rearrange themselves with each step you take."[156] In *The Scientific Way of Warfare*, Antoine Bousquet discussed a similar notion. In his analysis of chaos theory, as demonstrated by non linear systems, the author focused on sensitivity of initial conditions and how minor interactions, especially at the beginning, could retain immeasurable impact upon the entire system later.[157] Using a static and linear methodology to understand this type of counterintuitive and unpredictable environment, analysts might identify a myriad broken logic links that they felt were well informed. However, using a holistic method of inquiry, a user can again hover above the counterintuitive nature of the system and still ascertain meaning.[158]

In *The Interpretation of Cultures*, Clifford Geertz explained how an observer, using what he called a thick description, can best describe the counterintuitive nature of complex environments using a holistic approach vice a linear methodology.

> …[T]he distinction, relative in any case, that appears in the experimental or observational sciences between "description" and "explanation," appears here as one, even more relative, between "inscription" (thick description) and "specification" (diagnosis) – between setting down the meaning particular social actions have for the actors whose actions they are, and stating, as explicitly as we can manage, what the knowledge thus attained demonstrates about the society in which it is found and, beyond that, about social life as such.[159]

Geertz clearly indicated the criticality of seeking explanation beyond initial interactions between actors. While PMESII-PT may outline particular relationships, one can really only make such

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[156]Ibid.

[157]Antoine Bousquet, *The Scientific Way of Warfare* (New York, NY: Columbia University Press, 2009), 171. Furthermore, a reader can reference *Chaos: Making a New Science* where James Gleick presented how the "Butterfly Effect" works in complex environments with sensitive dependence on initial conditions.

[158]Gaddis, 78. In *The Landscape of History*, John Lewis Gaddis also suggested that chaos theory assisted observers by "[c]larifying the circumstances in which the predictable become unpredictable…,by showing patterns can still exist when there appears to be none…, [and] by demonstrating that these patterns can emerge spontaneously without anyone having put them there."

[159]Geertz, 27.

connections in a two dimensional manner. In doing so, an observer risks committing a cause and effect fallacy that inappropriately associates one action as the cause for another.

Due to the counterintuitive nature of complex environments, an observer may find difficulty in separating cause and effect in time and space, understanding how cause and effect can replace each other, or how an event can impact the system overall. In *Causality: Models, Reasoning, and Inference*, Judea Pearl, one of the pre-eminent researchers in the field of causality, stated that observers are always on a quest for "…efficacy in the face of imperfect compliance."[160] However, Pearl continued "…even in cases where casual quantities are not identifiable, reasonable assumptions about the salient relationships in the domain can be harnessed to yield useful…information about the causal forces that operate in the domain."[161] Although Pearl advocated a more mathematical approach to avoiding cause and effect fallacies, the author focused on indirectly influencing the salient components of an environment to better understand the system.[162] Although a PMESII-PT user can iteratively assess an environment to identify changes in various relationships, a holistic understanding will likely explain the reasoning for the changes in the first place. To go beyond the observable actions and address the true counterintuitiveness of the environment, as Geertz and Pearl advocated, one must use a holistic approach which stresses emergent relationships rather than all relationships.

As an example, a PMESII-PT user may identify several relationships between a modernizing political party, its informal militia, and the greater Muslim population with a largely traditional base and of the same ethnic background as the political leadership. As the interaction

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[160]Judea Pearl, *Causality: Models, Reasoning, and Inference* (Cambridge, UK: Cambridge University Press, 2000), 281.

[161]Ibid.

[162] In *Causation, Prediction, and Search*, Peter Spirtes, Clark Glymour, and Richard Scheines offer another mathematically based approach to convert observations into causal knowledge; furthermore, the authors offer an emergent approach to avoid a cause and effect fallacy and to still predict, influence, and even control an environment.

between the political entity, the supporting militia, and the population grows stronger, violence increases between the militia and other military aged males in the area. Using a two dimensional methodology, a PMESII-PT user may attempt to explain the increase in violence from the context of either or all three actors. The model highlights the actors and their relationship effectively and even leads PMESII-PT users to potential solutions. The political party may be growing too quickly in power and influence or the militia may be using inappropriate techniques to maintain order and support. The possible reasons for the violence and the subsequent cause and effect relationships are endless.

However, once again, the understanding which will better explain the *why* is noticeably absent. One must ask if the PMESII-PT model can elucidate, for example, a "…prevailing feeling of insecurity of…[the Muslim] younger educated middle-class…as an expression of the failure of the societies in which they live to make a successful adjustment between their heritage from the past and the demands of the present."[163] Continuing with the example, one may now deduce a more refined understanding of causality and, therefore, more rich conclusions about the environment. If the political party embraces a modern approach to handling societal issues, members of the military extension of the political organization can potentially be classified as agents for Western propaganda in the minds of the greater Muslim population. As a manifestation of such feelings, military aged males outside the militia and with a "prevailing feeling of insecurity" may turn to increasingly violent means to defend their heritage.

Although such potential solutions may not be correct, the point of the example goes beyond that. Users of PMESII-PT are inundated with apparent casual relationships that may or may not indicate the root cause of a problem within the environment. Analysts using PMESII-PT may then attribute militia activity to an incorrect cause and consequently misinform actions of

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[163]"Psychological Strategy Board," Annex B, Section 1a, White House Office, NSC Staff Papers 1948-1961, Box 16, Vol. III, Folder 8, 7.

PMESII-PT users. However, by starting with a foundational understanding of the youth in the environment, an observer is not trying to validate or invalidate a myriad of suppositions. Rather, users of a holistic approach allow observations to simply refine a fundamental understanding. In complex systems where counterintuitiveness dominates the logic of the environment, one is at a loss to define causes and effects without such an elemental understanding. However, unlike holistic approaches, a linear methodology could potentially promote a cause and effect fallacy that leaves the observer with a fundamentally wrong understanding. Even after users of PMESII-PT trace every relationship of every actor, a rich understanding can only be derived through an abstract understanding of the inverse and even implied relationships between the actors. Avoiding direct cause and effect relationships, holistic approaches highlight a foundational understanding from which readers can then make better informed and supported suppositions that address the counterintuitive nature of complex environments.

Gaps Between Holistic Methods and PMESII-PT: A Story of Perspective

Based on the differences between holistic approaches and linear methodologies as outlined in the previous section, a reader can better understand the inadequacy of applying PMESII-PT to understand complex environments. However, to understand specifically why holistic approaches capture the essence of an environment with more fidelity by addressing the openness, purposefulness, emergent property, multidimensionality, and counterintuitiveness, one must explore the two primary differences between holistic and linear methods: the use of a narrative and the inclusion of identity theory.

Narrative: A Descriptive Explanation, Not an Explanative Description

Unlike the categorized list of variables used in PMESII-PT, the other references explored through Khaduri, Patai, and members of President Eisenhower's PSB, offered richer explanations of social systems in narrative form while PMESII-PT does not. According to Ochs and Capps,

prominent linguistic anthropologists, narratives move "…audiences to more authentic feelings, beliefs, and actions and ultimately to a more authentic sense of life.[164] In *The Content of Form,* Hayden White suggested that "…narrative might well be considered a solution to a problem of general human concern, namely, the problem of how to translate knowing into telling."[165] Although linear methodologies of defining an environment may capture the "knowing" aspects of the system, observers must ascertain a deeper understanding beyond facts to truly find "meaning" in their observations. In describing an unfamiliar environment, observers seek to fashion their observations to convey meaning in a human sense rather than a historical one.[166] In a condemnation of traditional approaches, White suggested that "[m]ost historical disputes turn precisely on the matter on which among several linguistic protocols is to be used to *describe* the events under contention, not what explanatory system is to be applied to the events in order to reveal their meaning."[167] White contended that a "…straightforward copy of the events…indicates an absence or refusal of meaning itself…" because such methods, like PMESII-PT, deny the creativity requisite to combine reality with imagination.[168] White advocated that meaning, which goes beyond knowing, has to be presented in the form of a narrative.

Using a narrative, authors "…realize that the facts do not speak for themselves, but that the [observer] speaks for them…and fashions the fragments of the past into a whole whose

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[164]Elinor Ochs and Lisa Capps, "Narrating the Self," *Annual Review of Anthropology* Vol. 25 (1996): 23.

[165]Hayden White, *The Content of Form* (Baltimore, MD: The John Hopkins University Press, 1987), 1.

[166]In *The Content of Form,* Hayden White outlined three basic kinds of historical representation: the annals, the chronicle, and the history proper. White argued that the annals represented nothing more than a laundry list of events ordered chronologically while other narrative based methods convey much more meaning without the level of specificity.

[167]Hayden White, *Tropics of Discourse: Essays in Cultural Criticism* (Baltimore, MD: The John Hopkins University Press, 1978), 133-134.

[168]White, *The Content of Form,* 2.

integrity is – in its representation – a purely discursive one."[169] In the same manner that a novelists must present a meaningful story, an observer of a complex environment must convey understanding through a narrative. To do so, requires a "…desire to have real events display the coherence, integrity, fullness, and closure of an image of life that is and can only be imaginary."[170] However, as mentioned in previous analysis, observations must still retain contextual relevance or they will lose their meaning. In *The Lanscape of History*, John Lewis Gaddis suggested that observers have to "…resist the macro generalizations that, by oversimplifying causes, subvert narrative, and therefore detach representation from reality."[171] Rather, in analyzing events, rituals, and customs, one must seek to retain events in their context and "…practice particular generalization and not general particularization."[172]

Gaddis also suggested that narratives "…are reconstructions assembled in the virtual laboratories in the [observer's] mind of the processes that produced whatever structure seeking to be explained."[173] Using PMESII-PT, users of the methodology not only detach observations from their context but fail to integrate induction and deduction to present a thick description. As discussed earlier, users of holistic forms of inquiry seemed to shift from the macroscopic to the microscopic perspective in order to explain the multidimensionality of the environment. Consequently, a narrative should represent an integration of inductive and deductive approaches. Since military officials have a very realistic requirement to define an environment and not write a novel, they are "…obliged to tie [their] narrative as closely as possible to the evidence…"[174] That is an inductive process which seems PMESII-PT can accomplish. However, once users collect

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[169]White, *Tropics of Discourse*, 125.

[170]White, *The Content of Form*, 24.

[171]Gaddis, 105.

[172]Ibid.

[173]Ibid.

[174]Ibid., 107.

information and observations about an environment, they must decide on the data's relevance. That is a deductive process which PMESII-PT is woefully unable to accomplish. As gaps in knowledge are discovered, observers must research (inductive) and then fit the observations cogently into the narrative (deductive).[175] As the cycle continues to create the narrative, the authors of holistic approaches convey more than a simple understanding but rather a thick description of the environments they seek to explain.

Illustrating the holistic understanding presented in PSB narratives, the American Embassy in Karachi sent Dr. Edward P. Lilly, a PSB historian, a dispatch containing the following editorial that appeared in a Pakistani paper:

> There, inside the Russian border the Muslim lands appear to have passed into the oblivion, never to be seen and felt by any human being living outside that region. The Muslims on this side of the border do not know what is actually happening to their co-religionists on the other side. A systematic effort, it is said, is made to turn the entire Muslim population into a Godless people. They were conquered by force before the very eyes of the civilized world. They are held under the iron grip of and are treated ruthlessly without a single protest even from the free countries of the Muslim world. Woe be those nations that cease to be alert to the dangers that undermine their very foundations.[176]

Although the actual purpose of the aforementioned text is unknown, a reader can sense how the author, possibly operating within the PSB itself, skillfully used a narrative to leverage the fundamental differences between Communism and Islamic principles. In *Landscape Narratives*, Matthew Potteiger and Jamie Purinton described in detail "…the interplay and mutual relationship that develops between landscape and narrative." [177] The authors, like the PSB officials in the excerpt above, used the significance and power of the "Muslim lands" to elicit deeper and more sentimental emotions from the reader. Furthermore, based on such a

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[175]Gaddis, 107.

[176] "Foreign Service Dispatch – American Embassy, Karachi," Dwight D. Eisenhower Presidential Library, Abilene, KS, White House Office, NSC Staff Papers 1948-1961, OCB Secretarial Series, Box 5, A 82-18, 1.

[177]Matthew Potteiger and Jamie Purinton, *Landscape Narratives: Design Practices for Telling Stories* (New York, NY: John Wiley & Sons, Inc., 1998), 5.

demonstrated holistic understanding of the Muslim community, the public affairs officer knew to forward the second order narrative to Dr. Lilly for further "…use to missions in other Islamic countries."[178]

Once an observer of an environment conveys what Geertz referred to as a thick description in narrative format, one must now practically apply such understanding. As an example of how a narrative can still inform action, one can consider the approach of the Eisenhower administration to addressing Muslim affairs in the 1950s. According to several minutes from meetings of the Ad Hoc Working Group on Islam, Dr. W. Wendell Cleland, the chairman, expressed the "…need to take the ideological factor into account…" when discussing strategic approaches to the Islamic region.[179] More specifically, in a memorandum by Dr. Edward P. Lilly, the author suggested that the President favored "…greater emphasis on religious programs to peoples within the Communist orbit."[180] Furthermore, Lilly expressed disappointment that the PSB's findings were not integrated more into the comprehensive strategy of the administration towards Muslim nations. In separate documents from their initial analysis and narrative on the environment, PSB officials and President Eisenhower sought to incorporate and leverage their thick understanding to achieve national objectives.[181]

As the example above indicated, using a holistic approach, a reader can understand the overt emphasis of religion which is merely a subcomponent of the Social category of PMESII-PT.

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[178]"Foreign Service Dispatch – American Embassy, Karachi," White House Office, NSC Staff Papers 1948-1961, OCB Secretarial Series, Box 5, A 82-18, 1.

[179] "Memorandum of Meeting: Ad Hoc Working Group on Islam," Dwight D. Eisenhower Presidential Library, Abilene, KS, White House Office, NSC Staff Papers 1948-1961, Central File Services, Box 2, A 82-18, 1.

[180] "Memorandum: The Religious Factor," Dwight D. Eisenhower Presidential Library, Abilene, KS, White House Office, NSC Staff Papers 1948-1961, OCB Secretariat Services, Box 5, A 82-18, 1.

[181] "Operations Coordinating Board," Dwight D. Eisenhower Presidential Library, Abilene, KS, White House Office, NSC Staff Papers 1948-1961, OCB Central File Services, Box 77, A 82-18. In this account, writers indicate the strategic message of the U.S. to part of the Arab world. The authors suggested that the U.S. and Islamic countries exhibit similar values and that the Soviet Union is continuing to exploit Muslim nations and defiling the essence of their heritage.

Using a linear methodology, users classify religion as a subcomponent rather than a way of life that dominates all aspects of an environment as Islam demands. Using PMESII-PT, a user loses the overall holistic understanding of an environment through a compartmentalized methodology that reveals relationships but not holistic understanding through a narrative format. Although PMESII-PT may describe similar concepts as holistic approaches, one can notice that the methodology falls short of outlining the deeper historical underpinnings of Muslim traditions which make it fundamentally asymmetric. The model may describe various aspects of Muslim society but offers no proportional assessment of various components in light of their value within the system.[182] Even if PMESII-PT examines interrelated concepts to derive greater understanding, authors like Gharajedaghi, Geertz, and Gaddis would likely question the utility of such a methodology in the absence of a rich description in the form of a narrative. Therefore, in sharp contrast to the PMESII-PT methodology, Muslim scholars and past U.S. officials used holistic approaches to convey meaning in a narrative format.

Identity: A Prerequisite for Meaning

Holistic methods and the PMESII-PT methodology differ with respect to the application of identity theory. Consequently, users of PMESII-PT and holistic methodologies exhibit very

[182]Yi-Fu Tuan, *Space and Place: The Perspective of Experience* (Minneapolis, MN: The University of Minnesota Press, 1977), 136. In *Space and Place: The Perspective of Experience*, Yi-Fu Tuan explored the manner that people feel and think about space. The author suggested people form attachments to familiar locations and nations and that feeling about space and place can drastically influence an individual's emotional and physical perspective. An attempt to define an environment without a historical understanding of the space and place would result in an incomplete picture. Using a narrative, observers attempt to identify what Tuan defined as "…intimate experiences [that] lie buried in our innermost being..." Tuan continued to suggest that "deliberative acts" associated with this deep connection between individuals and their intimate experiences often manifest themselves with a higher degree of "poignancy." While PMESII-PT users may catalog the poignant observations of an environment, users of holistic approaches seek to understand the foundation, the intimate experiences, of the poignant actions through the narrative.

different forms of inquiry in this regard.[183] Although this concept of perspective is closely related to identifying the purposefulness or why certain actions and events occur within a system, this paper will now consider identity theory in a separate context. Identity theory refers to the construction and subsequent integration of various perspectives in order to holistically understand a system. In *Systems Thinking*, Jamshid Gharajedaghi simply stated that "…man creates his culture and his culture creates him."[184] The author later highlighted "…the critical role implicit culture-codes play in the process of learning, change, and dynamics…" within complex adaptive systems.[185]

Based on an individual's identity, one may find difficulty in both finding and conveying meaning. In relating the notion of identity to the narrative, Michael Roemer, in his book *Telling Stories*, suggested that the narrator "…sees himself acting alone, but is, in fact, everywhere connected…[i]n narrative, no one is an island however isolated or free he may believe himself to be." [186] Although humans may view themselves as independent, consider Roemer's insightful comments on such a notion.

> As we move through daily life, we are not generally aware of the frame that limits us. We tend to see ourselves as free individuals, albeit with a role to play in our community. Ideally, we perceive ourselves at once independent *and* connected. Perhaps our sense of freedom derives in part from the fact that we actually do not *see* ourselves…we are out own blind spot. [187]

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[183]Senge, 12. In *The Fifth Discipline*, Peter Senge discussed at length the need to suspend assumptions and worldviews in order to accurately understand a given environment. Users of holistic approaches seem to understand the criticality of suspending biases and traditional way of seeing the environment. While the PMESII-PT methodology focuses on gathering information, no explanation of the linear method requires users to similarly suspend assumptions. Hence, the forms of inquiry between the approaches differ significantly.

[184]Gharajedaghi, 85.

[185]Ibid.,121.

[186]Michael Roemer, *Telling Stories: Postmodernism and the Invalidation of Traditional Narrative* (Lanham, MD: University Press of America, Inc., 1997), 11.

[187]Ibid., 12.

According to Roemer, observers remain inextricably joined with their own context and experience. Consequently, due to their own identity, observers can only narrate their interpretation of what they see without seeing themselves.

Further expounding on the power and influence of identity throughout the process of understanding, Hayden White contended that "[t]he subjectivity of the discourse is given by the presence, explicit or implicit, of an ego…" which can ultimately only be defined by the person who sustains the discourse.[188] Additionally, White outlined the difficulty of mitigating the outward effect of one's ego to produce a narrative which "…is defined by the absence of all reference to the narrator."[189] Whether in observation, in analysis, or even narration, the identity of the observer dominates the entire process.[190] Consequently, in order to discern truth in the complex environments that one defines, individuals must undoubtedly understand identity and the central role the concept plays in ascertaining meaning.

Users of the PMESII-PT model interpret and input observations into the methodology from their perspectives. Readers need only consider an inadequate application of identity theory from a military perspective to understand how a linear methodology falls short. In "Ontological-Cultural Asymmetry and the Relevance of Grand Strategies," Henrotin and Struye de Swiedlande stated "…we have the tendency to believe that our potential opponents think and act in the same way we do."[191] Consequently, observers of an environment often presuppose that adversaries "…will follow the same rationality or more precisely the same perception of rationality as

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[188]White, *The Content of Form*, 3.

[189]Ibid.

[190]In "Cinematic Discourse: The Problem of Inner Speech," Paul Willemen also explored the notion of ego, which is manifested in inner speech, and how to overcome its influence while acting. Overcoming a very similar challenge, authors of narratives seem to make more of an effort to overcome their identity-based biases in order to ultimately present an artistic rendition of an environment in narrative format.

[191]Joseph Henrotin and Tanguy Struye de Swiedlande, 9.

ours."[192] The preexisting, static, and specific format of a linear methodology (P-M-E-S-I-I-P-T) prior to even examining a particular complex system, one assumes such categories are even relevant in the analyzed environment. Furthermore, as users correlate agents or observations from one category to another, they do so exclusively from an Occidental perspective thus ignoring the fact that the essence of the relationship, its true meaning, may be found in the perspective of the observed rather than that of the observer.

On the contrary, authors of holistic approaches make no assumptions with regard to the relevant aspects or categories of a system prior to analyzing it. Instead, authors of holistic approaches consider the tenets of identity theory, or how all relevant actors view themselves, in their quest for understanding. In *Learning for Action*, Peter Checkland and J. Poulter concluded that, to obtain meaning, leaders must execute an action oriented form of inquiry that enriches the knowledge and understanding of all participants, suspends worldviews, and ultimately seeks collaborative understanding rather than a quest for the one approved solution.[193] Similarly, users of a holistic approach seek understanding of events in their own context rather than selectively choosing events that make sense in the observer's context. In *Boundaries, Territory, and Postmodernity*, David Newman stated that "[t]he social construction of national identities is still inherently tied up with notions of territory, space, and place." [194] Thus, according to the author, to accurately define an environment, an approach must consider competing identities and capture the "…discourse [on] the changing functions and roles of…boundaries."[195] Using a linear format, this would prove extremely difficult to illustrate. For example, PMESII-PT may annotate

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[192]Ibid.

[193]Peter Checkland and John Poulter, *Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students* (Chichester: John Wiley & Sons, 2006), xv.

[194]David Newman, ed., "Geopolitics Rennaissant: Territory, Sovereignty, and the World Political Map,"in *Boundaries, Territory and Postmodernity* (Abington, Oxon: Frank Cass Publishers, 2002), 7.

[195]Ibid., 8.

observable border conflicts between parties with social, political, military, and economic boundaries. However, according to Newman, a method of inquiry must be able to capture the "…spatial reconfiguration of the world political map and the extent to which the previous dominance of the state as the supreme player in this map is now being shared with supra state and intra state levels of territorial ordering." Only by capturing multiple competing identities, can an observer explain boundaries that take on multidimensions and do not remain static.

Ken Booth, a professor for the University College of Wales and Security Studies expert, defined identity in the following excerpt:

> In the sociological tradition of thinking about identity, especially that of the symbolic internationalists, we do not come into the world as formed individuals, but are constructed out of the interaction between our individual genetic makeup and the various social structures in which we develop . . . Identity – who *I* really think I am / who one actually believes one is / who they think they are / what makes us believe we are the same and them different – is basic to many aspects of the discussion…[196]

Booth's succinct definition gets at the heart of the primary difference between holistic and linear approaches. Holistic methodologies more directly and adequately address the viewpoint of those within the system. Rather than trying to make sense from an external perspective, holistic approaches present narratives which describe concepts from the inside out by incorporating identity theory.

As an example, one can consider Eiseower's PSB narrative in a particular section discussing the attitudes and objectives of Arab leadership:

> The primary motivation of Middle Eastern leaders is the maintenance of their own positions. With few exceptions, they are characterized by political opportunism, and a lack of social consciousness and public responsibility. According to Western standards, they are self seeking, evasive, procrastinating, capricious, and lacking self-discipline.[197]

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[196]Ken Booth, "Security and Self Reflections of a Fallen Realist" (paper presented at the conference Strategies in Conflict: Approaches to Security Studies, York University, Toronto, May 12-14 1994), 4.

[197]"Psychological Strategy Board," Annex B, Section 1a, White House Office, NSC Staff Papers 1948-1961, Box 16, Vol. III, Folder 8, 14.

This description not only considers how the Arab leaders view themselves but also how Western leaders view their Arab counterparts. Additionally, authors of the narrative also considered how the Arab population perceives the West:

> The American is regarded as honest and energetic, highly endowed with technical ingenuity, but materialistic, lacking in culture and politically naïve.[198]

By considering multiple identities throughout the document, PSB officials present a rich and open ended interpretation of the social system. Using PMESII-PT to describe the same environment, users would have to identify relationships between actors in a manner that is not easily supported by the format of the model. The PMESII-PT methodology represents observations from a pre-determined lens while holistic approaches inherently consider multiple lenses simultaneously.

Nikki Slocum-Bradley, a Research Fellow at the Comparative Regional Integration Studies Programme of the United Nations University (UNU-CRIS), suggested that one of the primary reasons for conflict in the world today is "…the ways in which people form perceptions about themselves and others."[199] Furthermore, the ability of an individual, culture, or society to manipulate, corrupt, and promulgate particular identities both internally and externally plays a large role in the interactions of various peoples and their structures. Again implying at the difference between linear and holistic approaches, Slocum-Bradley contended that "…discursive approaches underscore the meanings attributed to identities in discourse…as a function of the social tasks being accomplished through identity discourse."[200] The author also links the concepts of the narrative and identity by suggesting that "[i]dentities are meanings…applied to persons or other narrated actors in specific contexts."[201]

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[198]Ibid., 11.

[199]Nikki Slocum-Bradley, ed., *Promoting Conflict or Peace through Identity* (Burlington, VT: Ashgate Publishing Company, 1988), 1.

[200]Ibid., 4.

[201]Ibid., 5.

Hayden White also described the delicate balance of writing a narrative in the context of a particular identity and warned readers that identity theory must consider perspectives of both the observed and the observer.

> Others will continue to insist that the integrity of history depends on its use of ordinary language and its avoidance of jargon. These latter suppose that ordinary language is a safeguard against ideological deformation of facts. What they fail to realize is that ordinary language itself has its own forms of terminological determinism represented by the figures of speech without which discourse itself is impossible.[202]

Although White seemed to imply that any narrative will inherently contain biases and prejudices due to the identity of a particular author, he does not ultimately advocate the futility of considering the identity of multiple actors in a system. By integrating identity theory more purposefully in any form of inquiry, observers can better preserve the overall integrity and exactness of the methodology. However, individuals must understand that all methodologies have limitations in the fact that one's culture and identity will ultimately reflect in any narrative.[203]

To ascertain a more useful understanding of the overall nature of a complex environment, one must apply a holistic analytical framework based on identity theory and in a narrative format. In a fundamentally asymmetric environment, a tool like PMESII-PT will, at best, illustrate primarily observable, although often interrelated reflections, but neglect to define the overall nature of a system or demonstrate a holistic understanding. In short, PMESII-PT may get at the *what* but not the *why* of complex social environments. Applying lessons learned thus far, this research paper will now offer alternatives to the process of inquiry aimed at understanding an environment. To illustrate the inadequacy of PMESII-PT, this paper used characteristics of

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[202]White, *Tropics of Discourse,* 134.

[203]For additional reading on identity and how to leverage identity of other cultures, readers can reference *Words and Stones* by Daniel Lefkowitz. The author does an exceptional job of outlining how Israeli identities are negotiated through their use of language. In doing so, the author sheds light on the broader processes of social dynamics within Israel.

complex adaptive systems. Using the same tenets of openness, purposefulness, multidimensionality, emergent property, and counterintuitiveness as a litmus test for efficacy, this paper will now present an approach to augment PMESII-PT in order to holistically assess an operational environment.

The Framework for an Inquisitive Process, Not a Theory

In the past, military personnel have employed PMESII-PT as a start point to assess an environment. The advantage of PMESII-PT is that users have at their disposal a proven methodology which at least provides an in depth knowledge about a system. Users of PMESII-PT can assess an environment and even notice new, although still superficial, relationships between actors within the system. However, in light of the previously outlined shortfalls of applying a linear methodology to a complex environment, the reader should understand the next step of this paper. Perhaps U.S. military planners need a more abstract "start point" which addresses the openness, purposefulness, multidimensionality, emergence, and counterintuitiveness of so called "wicked" environments in order to produce an identity based narration which leads to holistic understanding. Rather than a linear and predefined depiction of variables, like PMESII-PT, users of this more abstract approach will apply a more generic form of inquiry to ascertain the *why* and not simply the *what* of an environment.

Scholars and writers, like Michael Vlahos at John Hopkins University, have contended as recently as 2007 that the U.S. continues to deploy culturally obtuse leaders unable to understand the environments in which they operate.[204] In an effort to better understand the origins of such a scathing criticism, perhaps military leaders should critically assess the current methodologies they believe to provide environmental understanding. While some military leaders admire PMESII-PT's ability to highlight the interrelatedness of linear observations, authors like Bar Yam suggest

[204]Vlahos, 5.

"[i]t is reasonable to postulate that warfare can be better executed by those who understand complex systems than those who focus on simple, linear, transparent, classically logical, Newtonian constructs."[205] Although military officials can derive an interrelated understanding from a bottom up approach, perhaps PMESII-PT espouses linear collection techniques like "more is better" and ultimately produces a deceptively linear understanding rather than a holistic one.

In the previous section, research indicated that one can obtain a holistic understanding through contextual events examined in detail. Like ethnography, the issue with a holistic approach is making overarching conclusions from micro assessments. However, one must remember "[s]mall facts speak to large issues…" and that an observer must not only think concretely about observed facts but creatively about them also.[206] The intent of a holistic approach is to delve deeper into an environment to gain a more complete understanding. Nonetheless, to ascertain meaning, one still needs a general form of inquiry to guide the pursuit for rich understanding. To do so, an observer needs a general framework which successfully addresses the essence of any complex system and can serve as a litmus test for efficacy throughout the inquisitive process. Some may criticize such an effort by suggesting that both the proposed form of inquiry and general framework sound like the PMESII-PT methodology. Even Geertz warns the following:

> One cannot write a "General Theory of Cultural Interpretation" because the essential task of theory building here is not to codify abstract regularities but to make thick description possible, not to generalize across cases but to generalize within them.[207]

However, the author of this monograph is not attempting to create a theory but rather a form of inquiry more suitable than linear methodologies to assess a fundamentally assymetric

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[205]Yaneer Bar Yam, "Complexity of Military Conflict: Multiscale Complex Systems Analysis of Littoral Warfare," New England Complex Systems Institute, 2003, 1.

[206]Geertz, 26.

[207]Ibid.

environment and subsequently "make rich description possible." To accomplish this daunting task, the author also believes that an abstract point of departure has utility. Furthermore, the proposed holistic mode of inquiry has two distinct differences than its PMESII-PT counterpart. First, the proposed holistic approach will focus on the nature of a complex system through abstract concepts rather than using pre-defined variables. Second, the holistic approach will employ the art of iterative metaquestioning rather than linear answering.

Abstract Dimensions: Facets for Meaning and Not Simple Description

As discussed earlier, the origins of PMESII-PT remain somewhat convoluted. However, at least one explanation suggested that the methodology was originally created to assess sub-systems within an environment to then target. By describing the environment through the PMESII-PT variables, a user can know more about how the environment breathes to then target the most critical or influential components. However, unlike such a linear methodology, the dimensions of this holistic approach attempt to go beyond mere definition. To holistically understand a complex environment, a user must understand the facets that give the sub-systems themselves meaning. Military doctrine authors may have added "Physical Environment" and "Time" to define the meaning of an environment. "Time" is not a system but rather an effect on sub-systems like the "Political," "Military," "Economic," "Social," "Infrastructure," and "Information" apparatuses. Perhaps they believed that by analyzing how duration and geography influence the other sub-systems, a user can more completely understand a social system. Regardless of why military officials added effect based components, time and the physical environment are not adequate to holistically understand a fundamentally asymmetric environment. In the quest for such abstract facets that contain within them meaning rather than description, the author turned to the most comprehensive and historically supported list of social dimensions.

According to Gharajedaghi, the nature of any complex system is found in the interactions of five dimensions "…that collectively describe the organization in its totality."[208] Wealth, truth, beauty, values, and power represent the abstract dimensions used to more generically define complex environments. In the words of the author, here is a brief explanation of the overarching dimensions:

> 1. The generation and distribution of *wealth*, or the production of necessary goods and services and their equitable distribution. 2. The generation and dissemination of *truth*, or information, knowledge, and understanding. 3. The creation and dissemination of *beauty*, the emotional aspect of being, the meaningfulness and excitement of what is done in and of itself. 4. Formation and institutionalization of *values* for the purpose of regulating and maintaining interpersonal relationships: cooperation, coalition, competition, and conflict. 5. Development and duplication of *power*, the question of legitimacy, authority, and responsibility or, in general, the notion of governance.[209]

Although this paper will not attempt to validate these concepts as abstract principles worthy of examination, one can understand that the concepts are not only more universal than the tenets of PMESII-PT, but also incorporate loosely what the linear methodology attempts to outline.[210] For example, in the definition of the fifth social dimension, power, one can detect traces of the "Political," "Military," and even the "Social" aspects of PMESII-PT.

Since the five selected system dimensions will be used extensively to form this monograph's proposed holistic approach, a broader explanation of them is warranted. Throughout history, people have endeavored to identify social system dimensions. According to Gharajedaghi, "[h]istorically, the identification of social system dimensions has been both reactive (reacting to certain problems in social life) and proactive (reaching for the ultimate good)." [211] In a reactive sense, the selected five dimensions of wealth, truth, beauty, values and power correspond roughly to traditional problem areas, such economics, scientifics, aesthetics,

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[208]Gharajedaghi, 56.

[209]Ibid.

[210]Ibid.

[211]Ibid, 56-57.

ethics, and politics, found within complex social environments. Gharajedaghi continued to justify these facets by stating that most prominent social thinkers "…have chosen a single, and not surprisingly, different functions as the prime cause of all social phenomena."[212] For example, Karl Marx chose economics and Max Weber chose power as their respective focus areas. Although multiple authors and historical figures may disagree on the most critical social dimensions of complex environments, Gharjedaghi provided the most inclusive list. Collectively exploring these facets in context with each other, the author of this monograph believes these five abstract social dynamics sufficiently represent the system dimensions of almost any complex environment. Therefore, any form of inquiry should use these facets as a cognitive handrail.

Iterative MetaQuestioning: A Cyclic and Reflective Process

PMESII-PT advocates understand the necessity to iteratively use the methodology to capture changes in a complex system. Likewise, using a holistic approach, one must do the same to adjust, refine, or even augment understanding. Anyone operating in complex environments can expect a higher propensity for a "…mismatch between what was expected to happen and what actually did happen."[213] Authors like Gharajedaghi advocated that one must continually and simultaneously execute iterations of "structure, function, and process" of an environment to gain a full understanding.[214] Consequently, any new holistic method of inquiry to understanding an environment must include an iterative process of questioning. Thus, by applying such an iterative form of inquiry that struggles to continually discover the true nature of a complex system, an analyst can ascertain a much higher level of meaning.[215]

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[212]Ibid.

[213]Ibid., 75.

[214]Ibid., 112.

[215]As discussed previously, Gaddis recommended an iterative integration of inductive and deductive approaches to write a rich narrative. Similarly, McNeill demonstrated an iterative ability to shift between micro and macro perspectives to convey meaning. Finally, the perpetual "why-because" cycle,

U.S. Army Colonel Stefan Banach, Director of the School for Advanced Military Studies at Fort Leavenworth, Kansas, defined the origins of metacognitive-questioning in reflective thinking and suggested that metacognition "…involves two separate kinds of knowledge. The first is knowledge about cognition…[and the] second is knowledge about how to regulate and control cognitive activity…"[216] This description of the metacognitive process prompts users to ask questions about questions in order to reveal a deeper understanding and to avoid the pitfalls of linear thinking. According to Banach, the metaquestioning process can assist military personnel operating in complex environments to "…determine the depths of the current understanding of the system; to consider second- and third-order effects of action; to introduce alternative perspectives that may challenge the established relationships and mental models of the situation; and to help create the narrative that explains the systemic logic of the operational environment."[217]

John H. Flavell, a prominent psychologist cited for his exceptional work on cognitive development, suggested that "[m]etacognition refers, among other things, to the active monitoring and consequent regulation and orchestration of…processes in relation to the cognitive objects or data on which they bear, usually in service of some concrete goal or objective."[218] In an article responding to Flavell's thoughts on metacognition, Werner Feibel, a colleague of Flavell,

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which was deemed as imperative to understanding the purposefulness of a complex environment, are three examples of how iteration has surfaced throughout previous analysis of this paper. Research indicated that any holistic approach should exhibit an iterative nature; hence, for the purposes of this paper, the author is simply reintroducing the concept to proceed with the proposed framework. Additionally, one should not confuse iteration with reframing. Although the two concepts are related, iteration refers to a perpetual process of "digging deeper" about an observation while reframing refers more, in a macro sense, to the process of seeking a completely new understanding based on revelations or observations. Although observers of a complex system seeking understanding should "iteratively reframe," the two concepts rename distinct.

[216]Colonel Stefan J. Banach. "The Art of Design: A Design Methodology," *Military Review* (March-April 2009), 108.

[217]Ibid.

[218]Flavell, J. H. (1976) "Metacognitive aspects of problem solving," L. B. Resnick, ed., in *The Nature of Intelligence* (Hillsdale, NJ: Erlbaum, 1976), 232.

advocated the utility of analyzing metacognition to "…make systematic and plausible inferences concerning such reflective psychological processes."[219] Then, bridging the gap between metacognition and metaquestioning, the author then stated "…the paradigm demonstrates very nicely how one can tailor the method to the questions, rather than the other way around—as is only too common…" By employing a linear and predefined methodology, users of PMESII-PT seek answers to the method rather than asking questions to form the method.

Based on the abstract dimensions of wealth, truth, beauty, values, and power of any social system, it is now possible to apply a process of iterative metaquestioning to finally develop a holistic mode of inquiry. If most social systems retain the dimensions just outlined, then one should base the iterative-metaquestioning process on those principles to ascertain a rich understanding of an environment. By engaging in a cyclic process of metaquestioning, users of the proposed holistic approach will be more apt to understanding the essence of any complex environment.[220] With this in mind, this monograph will now outline an abstract and identity-based approach that applies an iterative metaquestioning technique to ascertain meaning from the dimensions of wealth, truth, beauty, values, and power found within any social system.

An Abstract Holistic Methodology: Questions Over Answers

In his book *Educating the Reflective Practitioner*, Donald A. Schön, a prolific and extremely influential author, encouraged readers to derive innovative methods of reasoning "…by constructing and testing new categories of understanding, strategies of action, and ways of

[219]Werner Feibel, "On Applying Metacognition to Metacognition about Metacognition: A Redundant Reaction?" in *Structural/Process Models of Complex Human Behavior*, ed. J.M. Scandura and C.J. Brainerd (Alphen a.d. Rejn, The Netherlands: Sijthoff and Noordhoff International Publisher, 1978), 247.

[220]For additional resources on metaquestioning, a reader can reference *Metacognition: Core Readings* edited by Thomas O. Nelson and *Asking the Right Questions: A Guide to Critical Thinking* by M. Neil Browne and Stuart M. Keeley.

framing problems."[221] While reflecting in action on other holistic methods to frame an environment, a reader can identify the need to incorporate more overt and somewhat prescriptive guidance to garner a holistic understanding of the environmental frame. To add more fidelity to the proposed abstract holistic methodology and provide readers a tool to then create rich narratives, this monograph will attempt derive an identity-based approach that uses meta-cognitive questions to explore the abstract social dimensions of a complex environment. By perpetually asking and seeking clarity on these aspects, a user of this holistic form of inquiry can then ideally ascertain a meaningful understanding of any social system. To move forward on the holistic form of inquiry, this paper will now further refine the concept by adding specific meta-cognitive questions that seek precise understanding of wealth, truth, beauty, values, and power. In capturing the essence of these facets, an individual can ascertain meaning from a complex system.[222]

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[221]Donald A. Schön, *Educating the Reflective Practitioner* (San Francisco, CA: Jossey-Bass, Inc., 1987), 39.

[222]Shimon Naveh, "Asymmetric Conflict: An Operational reflection on Hegemonic Strategies," (2002), 21. The general framework, intellectual foundation, and logic for the proposed holistic approach described above are based on the writings of Dr. BG (res.) Shimon Naveh. In his paper, "Asymmetric Conflict: An Operational reflection on Hegemonic Strategies," Naveh sought to better inform strategic decision making in the context of competing worldviews and operating in an asymmetric environment. Naveh's argument suggested that "…unlike cases of cultural symmetry...in a competition against a social entity whose *raison d'etre* derives from a different cultural source,…meta problems are raised. [T]he rationalization of the 'unique other' as a reference for the construction of a relevant logic of one's 'self' invites organizational epistemology and learning practices that differ from those exercised in conditions of cultural homogeneity." To address this concern laden with identity-related challenges, Naveh developed an identity-based metaquestioning approach that structured a "…systemic conception of contextual logic…[by] asking questions about issues…" By reading Naveh's methods, the author of this paper then used a very similar logic to create the identity-based metaquestions centered on generic system dimensions (wealth, truth, beauty, values and power) within complex environments to gain meaning. Like Naveh, who stressed the criticality of asking metaquestions in the quest for understanding to then develop theoretical frames, the aforementioned proposed holistic approach in this paper should ideally lead users to asking metaquestions in the quest for understanding to then develop environmental frames.

Wealth: You are What You Exchange

In seeking meaning behind the exchange of goods and services, a user can better understand not only what actors in the system value but why they value such items. Before analyzing wealth in a complex system, a user of this holistic methodology must divest any preconceived notions of wealth from his or her perspective. One must be prepared to discover that money or property may not define wealth in the environment. Additionally, users must seek meaning in not only identifying the true trappings of wealth but also why such artifacts embolden understanding of wealth. A user should employ the holistic form of inquiry to discern the historical underpinnings of wealth as well. To guide the approach, the following meta-cognitive questions, asked iteratively, may facilitate meaning: How do the actors in the system view wealth? What are the sources of wealth? Why are those sources of wealth? What symbols in the environment indicate wealth? Why are those symbols of wealth? How do actors exchange, transfer, and extend wealth? Why do actors exchange, transfer, and extend wealth? How do actors retain wealth? How is their understanding of wealth, in the context of the observed environment, defined by or related to the other social dimensions? How does my understanding of wealth conflict or support my understanding of wealth in the environment? How do actors in the environment view my understanding of wealth? As a user asks questions about wealth, one may then seek illustrative examples that convey the essence of the concept. Users must always remember that the environment is an open system and should not limit their understanding to just wealth but also how the concept relates to other social dimensions.

Truth: You are What You Say

To discover why actors in complex environments deem certain words and thoughts as representations of truth in their minds, users of this holistic approach should seek meaning in how and what information, knowledge, and understanding actors generate and exchange. Through a deliberate analysis of these cognitive artifacts, an external observer can discern the origins of

such thoughts and why actors hold such notions close to their hearts as truth. A user of a holistic form of inquiry can then discern greater meaning in certain actions that are manifestations of the actors' definitions of truth. A user may be able to understand why seemingly unrelated information actually makes sense from the actor's perspective, be able to interpret certain behavior that would otherwise go unnoticed, and even predict behavior based on the actor's notion of truth. To discover meaning with respect to truth, a user of this holistic approach must again suspend biases. A user may have to sacrifice at the altar of meaningfulness notions of truth he or she vehemently believes in. For example, an American military officer may have to ignore preconceived notions of justice, honor, or service in order to not judge, and therefore understand, another actor's definition of truth.

To guide the discovery of meaningfulness with respect to truth, the following meta-questions may assist a user of the proposed holistic approach: How do the actors in the system view truth? Why do they view truth the way they do? How do they communicate or convey truth? Why do they communicate or convey truth in that format? Do actors seek to understand truth? How do actors instill or ignore their concept of truth in other members of the environment? Why do actors behave in this way in regard to truth? What is the source of the actors understanding of truth? What are the origins of the actors' interpretation or understanding of truth? How is their understanding of truth defined by or related to the other social dimensions? How does my understanding of truth conflict or support my understanding of truth in the environment? How do actors in the environment view my understanding of truth? By seeking understanding in what actors say, write, or signal non-verbally, a user of a holistic approach can direct questions about truth to ascertain meaning about the social system.

Beauty: A Key to Ontological Insight

By using a holistic form of inquiry to understand how and why actors within a complex environment create and transmit an emotional aspect of being, a user of a holistic approach can

find meaning in the actors' notion of beauty. Although the other social dimensions exhibit ontological origins as well, an observer seeking meaning in beauty may potentially discover the very essence of the actors because beauty is so closely tied to emotions like happiness or sadness. An exploration of beauty may reveal insight into why certain actions or interactions bring excitement or why certain actions even have meaning from the perspective of the actors. In seeking understanding of beauty, a user of a holistic method of inquiry, may want to ask questions about why sources of beauty are considered beautiful or why certain artifacts of beauty resonate with agents. To do so, observers must not look for what they find beautiful but what agents inside the complex system find beautiful. Artifacts are often useful start points but users of holistic approaches should not restrict meaning to physical objects. Beauty may also extend to ideas and even landscape.

To guide the process, the following meta-questions may be of use: What do actors in the environment value as sacred or exhibiting beauty? Why do actors view beauty in this way? How do actors show appreciation for beauty? Why do actors show appreciation for beauty? What are sources of beauty in the environment? Why are these considered sources of beauty? What are the origins for such an understanding or appreciation of beauty? How is their understanding of beauty defined by or related to any of the other social dimensions? How does my understanding of beauty conflict or support my understanding of beauty in the environment? How do actors in the environment view my understanding of beauty?

Values: The Rules of the Game

To gain meaning from the values or social rules within a complex environment, users of the proposed holistic approach should apply the iterative metaquestioning process to asking why actors cooperate and compete at an interpersonal level. By understanding why certain social norms are formed, institutionalized, and regulated, an observer can gain tremendous insight. One can expect that all the social dimensions will overlap and users should not ever constrain

understanding to just one facet of the social dimensions. In fact, users of the holistic approach should seek understanding of one facet in the context of the others. Especially when seeking meaning with regard to what values are maintained in a complex environment, how values got there, and why certain values remain, a user of the proposed holistic approach should ask questions about other social facets. For example, as mentioned previously, discerning why an actor values beauty, wealth, or truth can reveal deep insight into the nature of a complex environment. Likewise, a user must also ask why and how beauty and wealth impact the actors' values and relationships. Since users of the holistic approach also possess values of their own, they must be cognizant of impressing values upon the observed actors. Rather than starting with an observer's values and then seeking confirmation from the environment, users should start with observing interpersonal relationships within the social system to obtain meaning with respect to values.

To assist a holistic observer, the following meta-questions can guide inquiry: What values guide the actors and the system? Why do the values guide them? How do actors exhibit values? Why are these methods chosen? What are the origins of values? Why do actors preserve such origins in their system? What is the authority for values in the system? Why is that the authority? How does the environment regulate values? Why does the environment regulate values? How is their understanding of values manifested by or related to any of the other social dimensions? How does my understanding of values conflict or support my understanding of values in the environment? How do actors in the environment view my understanding of values?

Power: Controlling the Masses

When applying a metaquestioning process to discover meaning in the nature of power, a user of the proposed holistic approach is really seeking how and why individuals and/or institutions can control others. Beyond the mere governmental structures within a complex environment, an observer must ask why certain techniques or methods actually work to control

the populace. Additionally, when asking questions about power, a user must explore the notions of legitimacy, authority, and responsibility. In order to conduct such an analysis, users of a holistic approach must explore both formal and informal power relationships at the individual, familial, and communal levels. Observers must not always equate power to force and assume actors must always exert physical dominance to control other actors. By asking questions about both passive and active measures that actors use to control or influence others and why such techniques are effective, a user of the proposed holistic approach can uncover tremendous meaning.

To guide inquiry, the following meta-questions can assist: What actors in the system exhibit authority and influence in the environment? Why is power exhibited and perceived in this way? How and why is power duplicated? What are the sources of power? Why are these considered sources of power? How is power manifested in the environment? Why is power manifested in the environment? How to actors responsibly retain power? How do actors responsibly wield power? Why are such actions considered "responsible?" Why are certain power brokers considered legitimate? How is their understanding of power defined by or related to any of the other social dimensions? How does my understanding of power conflict or support my understanding of power in the environment? How do actors in the environment view my understanding of power?

By way of example, a researcher can iteratively use the aforementioned identity-based metaquestioning process to guide a holistic approach aimed at ascertaining greater meaning of a complex system. Through an exploration of the facets of wealth, truth, beauty, values and power, users of the proposed approach will notice recurring themes in the environment. Instead of getting lost in quantifiable observations, one can begin to see how two or more seemingly unrelated activities retain the same underlying logic. Consequently, as the iterative process progresses, a rich understanding emerges and so too a second order machine. Elucidating a layer of why much deeper than a linear methodology, users of this approach can now better explain and

perhaps predict observable behavior. As users ascertain more and more meaning, they can then fashion a narrative which explains the foundational basis for why the complex environment functions in a particular manner. More importantly, they can then use such understanding to inform future actions within the environment to achieve the highest levels of effectiveness.

Conclusion: A Non-Linear Solution Requires a Non-Linear Form of Inquiry

Authors and scholars of the past like Khadduri, Patai, and members of Eisenhower's administration presented rich narratives that conveyed a very similar holistic understanding of a complex social environment. However, the previously mentioned authors do not layout their methodologies to defining their respective environments; they convey meaning but the form of inquiry used to ascertain such a rich understanding is somewhat of a mystery. By examining their works, this paper has not only highlighted the shortfalls of more linear methodologies but also attempted to outline an abstract holistic approach to guide future inquiry. Although their methods are not clearly defined, other approaches to understanding an environment do exist. First, in an article "A Leader's Framework for Decision Making" for Harvard Business Review, David J. Snowden and Mary E. Boone, prominent authors on leadership, present their Cynefin framework to "…help executives sense which context they are in so that they can not only make better decisions but also avoid the problems that arise when their preferred management style causes them to make mistakes."[223] In addition to defining complex situations, the authors offer concrete steps to both sense and manage such environments. Overall, the authors do an excellent job of explaining previously explored topics like nonlinearity and even identity. However, they only offer techniques to manage and define complexity; their holistic methodology fails to fully explore the nature of complex situations in of themselves. In other words, the authors express

[223]David J. Snowden and Mary E. Boone, "A Leader's Framework for Decision Making," *Harvard Business Review*, (November, 2007): 2.

exceptional advice on navigating through and harnessing the effects of complexity but offer little in terms of understanding the content of complex environments themselves. Consequently, the authors do not advocate the use of a narrative or metaquestiong to depict a rich understanding of a complex situation but highlight instead "…tools for managing in a complex context."[224]

Second, Gharajedaghi provided the most quantifiable depiction of his holistic approach to understanding an environment. The author not only outlined his overarching system principles but also defined the five social dimensions of wealth, truth, beauty, values, and power used in this monograph. Gharajedaghi highlighted the criticality of previously discussed concepts like complexity, nonlinearity, and even the narrative. In fact, he stated "[p]roper packaging and communication of the message is as important as the content of the message itself."[225] Although Gharajedaghi does stress the importance of a shared image and cultural understanding, the author does not purposefully integrate methods to ensure the incorporation of identity theory while seeking a greater understanding of a social environment. Furthermore, although Gharajedaghi provided the most inclusive and detailed definitions of the dynamics within complex systems, he does not propose a metaquestioning process that a user can utilize to then holistically understand a complex environment.

Third, the U.S. Army's Design methodology encapsulates the best example of a holistic means to define an environment. In current design doctrine, authors encourage the use of the narrative and highlight the difficulty and challenge of fully appreciating "…the operational environment from diverse perspectives..."[226] Furthermore, authors direct practitioners to construct the observed system using, if possible, "…outside stakeholders [who] can help to see

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[224]Boone and Snow, 6.

[225]Gharajedaghi, 140.

[226]U.S. Department of Defense, *U.S. Army Field Manual Interim 5-2, Design (DRAFT)*, (Washington, D.C.: U.S. Government Printing Office, February 2009), 21.

the environment in a new light."[227] A reader can assume the foundational basis for such guidance rests within identity theory. However, while explaining the framework for the desired system within the environmental frame, doctrine authors do not seem to advocate identity theory again. If the desired end state "…accounts for tendencies and potentials that exist among relevant actors…," then an individual must capture reality from the perspectives of all actors in order to accurately create the desired system.[228] Identity theory allows a planner to see the desired system in a holistic manner, yet current doctrine leads practitioners to create a desired system devoid of the enemy's perspective.

Although other holistic approaches do exist, none seem to clearly outline an abstract methodology to achieve an understanding of an environment.[229] Again, Design comes the closest by advocating both the narrative and, to some extent, the inclusion of identity theory when creating the environmental frame. Additionally, the current Design Field Manual explains precisely what is required to ascertain a holistic understanding of an environment:

> The commander must gain a systemic understanding of the situation. The operational environment, which includes people and the relationships between them, is inherently complex and non-linear. In order to understand such an environment, it must be studied holistically as a system. Reductionism and analysis are not as useful with a complex system because they lose sight of the interaction and dynamics between the components. Thus, designers must think in terms of biological rather than mechanical systems because each individual part has great freedom of action and there exist many linkages between the components. The study of complex systems must be systemic rather than reductionist, and qualitative rather than quantitative, and must use heuristic approaches rather than analytical problem solving.[230]

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[227]Ibid., 21.

[228]U.S. Department of Defense, *U.S. Army Field Manual 5-0, Chapter 3, Design, Version 5.2 (as of 17 JUL 09)*, (Washington, D.C.: U.S. Government Printing Office, February 2009), Line 316-317.

[229]Almost all other methodologies considered, including Design, stress the criticality of defining complex environments and even offer cognitive tools and techniques to accomplish the task – like metaquestioning, identity theory, iteration, etc. However, none of the approaches explicitly provide an abstract methodology to define an environment by employing the aforementioned techniques.

[230]FMI 5-2, 8.

However, despite such an accurate depiction of how to define an operational environment, authors of Design still encourage users to explore both the tangible and intangible aspects of PMESII-PT to gain such understanding.

The recommendation to use such linear methodologies, like PMESII-PT or ASCOPE, to ascertain meaning is considerably inadequate. Although very comprehensive and detailed, the linear nature of these models restricts the level of holistic understanding required by Design to understand fundamentally asymmetric environments. Ironically lacking the same identity-based and narrative form of inquiry that Design advocates, PMESII-PT forsakes holistic understanding and settles only for better description. A non-linear approach like Design demands a non-linear and holistic form of inquiry that allows users gain meaning, not simply a detailed description, of an environment. Provided in narrative format, this proposed holistic approach considers identity and recommends the application of a metacognitive form of inquiry to explore the facets of wealth, truth, beauty, values and power of a given complex system; such a heuristic form of inquiry better compliments a methodology like design. By applying this more abstract approach, a user can holistically understand an environment without the restrictions of a linear model. Furthermore, the generic form of inquiry provides more fidelity to a process that the authors in the past have failed to quantify. To ascertain the *why* and not simply the *what* of an environment and subsequently gain a holistic understanding, a reader now has a somewhat tangible start point to begin the inquisitive process. Empowered with a deep meaning rather than a comprehensive description, military leaders can better harness the complexity of the most daunting environments to achieve successful results.

APPENDIX A: Dictionary of the Ten Most Critical Definitions Required to Understand Complexity – A Compare and Contrast Reference Chart

Linear: "For a system to be linear it must meet two simple conditions. The first is proportionality, indicating that changes in system output are proportional to changes in system input. Such systems display what in economics is called 'constant returns to scale,' implying that small causes produce small effects, and that large causes generate large effects. The second condition of linearity, called additivity or superposition, underlies the process of analysis. The central concept is that the whole is equal to the sum of its parts. This allows the problem to be broken up into smaller pieces that, once solved, can be added back together to obtain the solution to the original problem…If the behavior of a system can appropriately be broken into parts that can be compartmentalized, it may be classified as linear, even if it is described by a complicated equation with many terms." [231]	**Nonlinear**: Nonlinear systems are those that disobey proportionality or additivity. They may exhibit erratic behavior through disproportionately large or disproportionately small outputs, or they may involve "synergistic" interactions in which the whole is not equal to the sum of the parts. [232]
Reductionism: "[T]he theory that every complex phenomenon, esp. in biology or psychology, can be explained by analyzing the simplest, most basic physical mechanisms that are in operation during the phenomenon. [T]he practice of simplifying a complex idea, issue, condition, or the like, esp. to the point of minimizing, obscuring, or distorting it.[233]	**Holism:** "[T]he idea that all the properties of a given system (physical, biological, chemical, social, economic, mental, linguistic, etc.) cannot be determined or explained by its component parts alone." [234] "[T]he theory that the parts of any whole cannot exist and cannot be understood except in their relation to the whole; 'holism holds that the whole is greater than the sum of its parts'"[235]

[231]Beyerchen, 53.

[232]Ibid.

[233]Dictionary.com, http://dictionary.reference.com/browse/reductionism (accessed March 15, 2010).

[234]HolisticPedia: The Holisitc Encyclopedia, http://www.holisticpedia.com/ (accessed March 15, 2010).

[235]TheFreeDictionary, http://www.thefreedictionary.com/holism (accessed March 15, 2010).

Concrete: Something that is "pertaining to or concerned with realities or actual instances rather than abstractions; particular (opposed to general)..."[236]	**Abstract**: Something existing only in the mind and separated from embodiment – abstract words like "truth" and "justice." Something considered apart from a particular case or instance. To consider a concept without thinking of a specific example; to consider abstractly or theoretically.[237]
Complicated: "To understand what complexity science is about, it is helpful to draw a distinction between complicated and complex systems. Traditional science excels at the complicated, but encounters considerable limitations that make it ill-suited to the complex. An example of a complicated system is an automobile, composed of thousands of parts whose interactions obey precise, simple, known and unchanging cause-and-effect rules. The complicated car can be well understood using normal engineering analyses."[238]	**Complex**: "An ensemble of cars travelling down a highway, by contrast, is a complex system. Drivers interact and mutually adjust their behaviours based on diverse factors such as perceptions, expectations, habits, even emotions. Excepting the 3 constraints imposed by physical laws that apply to vehicular motions (and, possibly, collisions), actual traffic flow cannot be predicted with certainty. No one driver is in control and there is no single destination. To understand traffic, and to build better highways, set speed limits, install automatic radar systems, etc., it is helpful to have tools that can accommodate non-linear and collective patterns of behaviour, and varieties of driver types or rules that might be imposed. The tools of complexity science are needed in this case."[239]
Open: A system which continuously interacts with the environment and where matter or energy can flow into and/or out of the system. In thermodynamics, "[o]pen systems exchange energy (heat and work) and matter with their environment. A boundary allowing matter exchange is called permeable. The	**Closed:** A system which is continuously in the state of being isolated from its surrounding environment. In thermodynamics, "[c]losed systems are able to exchange energy (heat and work) but not matter with their environment. A greenhouse is an example of a closed system

[236]Dictionary.com, http://dictionary.reference.com/browse/reductionism (accessed March 15, 2010).

[237]TheFreeDictionary, http://www.thefreedictionary.com/abstract (accessed March 15, 2010).

[238]Organisation for Economic Co-operation and Development (OECD) Global Science Forum, "Applications of Complexity Science for Public Policy: New Tools for Finding Unanticipated Consequences and Unrealized Opportunities" (report presented at workshop convened at the Ettore Majorana International Centre for Scientific Culture, Erice, Sicily, October 5-7, 2008).

[239]Ibid.

ocean would be an example of an open system."[240]	exchanging heat but not work with its environment. Whether a system exchanges heat, work or both is usually thought of as a property of its boundary."[241]

[240]Statemaster Encyclopedia System, http://www.statemaster.com/encyclopedia/System-(thermodynamics) (accessed March 15, 2010).

[241]Ibid.

APPENDIX B: Survey of U.S. Army Officers on Operational Experience Using PMESII-PT

OPERATIONAL EXPERIENCE USING PMESII-PT

I am an Army Officer attending the School of Advanced Military Studies at Fort Leavenworth, Kansas. I am conducting research on the application, understanding, and utility of PMESII-PT in complex operating environments.

PMESII-PT is an acronym explained in U.S. Army Field Manual 3-0 and used to ascertain a better understanding of an operational environment. PMESII-PT stands for Political, Military, Economic, Social, Information, Infrastructure, Physical Environment, and Time. Accroding to doctrine, planners can utilize the various variables to guide analysis in order to better understand the operational envirnment.

Your input is important for this research. The survey will take approximately 5 minutes to complete. Participation is voluntary and all information collected is confidential. Survey results will be used solely for this research.

Thank you for your assistance.

Year Group:

Banch (IN, AR, FA, SF, ect):

Course Attending:

This Survey has been approved by the Command and General Staff College, Quality Assurance Office.
Survey Control number is 10-061

The POC for this survey is MAJ Brian Ducote at brian.ducote@us.army.mil

Page 1 SAVE 25% 50% 75% 100% inquisite

OPERATIONAL EXPERIENCE USING PMESII-PT

Have you ever used PMESII-PT in a training, garrison, or combat setting to assess an operational environment?

- Yes, in training
- Yes, in garrison
- Yes, in combat
- Yes, in more than one setting
- No

How would you best describe your familiarity with applying PMESII-PT?

How would you best describe the purpose of PMESII-PT?

- The purpose of PMESII-PT is to derive a unique understanding of an operational environment which extends beyond the variables.
- The purpose of PMESII-PT is to gain a better understanding of an operational development by using the variables to assess interactions and relationships.
- Other

Page 2 SAVE 25% 50% 75% 100% inquisite

OPERATIONAL EXPERIENCE USING PMESII-PT

Although you do not have practical experience in applying PMESII-PT, do you understand the purpose of the methodology?

- ○ Yes
- ○ No

Although you do not have practical experience in applying PMESII-PT, how would you best describe your familiarity with applying PMESII-PT?

[▼]

Although you do not have practical experience in applying PMESII-PT, how would you best describe the purpose of PMESII-PT?

- ☐ The purpose of PMESII-PT is to derive a unique understanding of an operational environment which extends beyond the variables.
- ☐ The purpose of PMESII-PT is to gain a better understanding of an operational environment by using the variables to assess interactions and relationships.
- ☐ Other [ ]

Page 3 ▼ ← → SAVE 25% 50% 75% 100% inquisite

OPERATIONAL EXPERIENCE USING PMESII-PT

Please consider the following definitions of linear and non-linear models before answering the final question.

A linear construct allows users to gather information and/or observations to input into a model in order to gain a better understanding of a system or environment. The higher quality and/or quantity yields greater results. By analyzing the various interactions of the "parts" within the model, a user can gain a better understanding of the "whole" environment.

A non-linear construct disobeys the notion of proportionality and by inputting higher quantity/quality observations, the model does not neccessarily yield a greater understanding. Non-linear models may exhibit erratic behavior through disproportionately large or disproportionately small outputs, or they may involve "synergistic" interactions in which understanding of the "whole" environment is not equal to the sum of the "parts."

Based on your experience, your general understanding, or a combination of both, how would you best describe the PMESII-PT methodology in the context of the definitions above?

- ☐ PMESII-PT is a linear methodology
- ☐ PMESII-PT is a non-linear methodology
- ☐ Other [ ]

Page 4 ▼ ← → SAVE 25% 50% 75% 100% inquisite

OPERATIONAL EXPERIENCE
USING PMESII-PT

Thank you for your participation in this research.

Please click the "Finish" button below to submit your responses.

PMESII-PT Survey Count and Percent

PMESII-PT Survey

		Count	Percent
Year Group:			
1995		1	4.35 %
1996		7	30.43 %
1997		8	34.78 %
1998		3	13.04 %
1999		3	13.04 %
2000		1	4.35 %
	Total Responses	**23**	**100.00 %**
Course Attending:			
ILE		22	95.65 %
OTHER		1	4.35 %
	Total Responses	**23**	**100.00 %**
Have you ever used PMESII-PT in a training, garrison, or combat setting to assess an operational environment?			
Yes, in training		8	34.78 %
Yes, in combat		1	4.35 %
Yes, in more than one setting		6	26.09 %
No		8	34.78 %
	Total Responses	**23**	**100.00 %**
How would you best describe the purpose of PMESII-PT?			
The purpose of PMESII-PT is to derive a unique understanding of an operational environment which extends beyond the variables.		9	28.33 %
The purpose of PMESII-PT is to gain a better understanding of an operational development by using the variables to assess interactions and relationships.		5	65.00 %
Other		1	6.67 %
	Total Responses	**15**	**100.00 %**
How would you best describe your familiarity with applying PMESII-PT?			
Extremely Familiar		1	7.69 %
Very Familiar		3	23.08 %
Familiar		9	69.23 %
	Total Responses	**13**	**100.00 %**

PMESII-PT Survey Count and Percent

PMESII-PT Survey

	Count	Percent
Although you do not have practical experience in applying PMESII-PT, do you understand the purpose of the methodology?		
Yes	8	100.00 %
Total Responses	**8**	**100.00 %**
Although you do not have practical experience in applying PMESII-PT, how would you best describe your familiarity with applying PMESII-PT?		
Very Familiar	3	42.86 %
Familiar	3	42.86 %
Somewhat Familiar	1	14.29 %
Total Responses	**7**	**100.00 %**
Although you do not have practical experience in applying PMESII-PT, how would you best describe the purpose of PMESII-PT?		
The purpose of PMESII-PT is to derive a unique understanding of an operational environment which extends beyond the variables.	1	12.50 %
The purpose of PMESII-PT is to gain a better understanding of an operational environment by using the variables to assess interactions and relationships.	7	87.50 %
Total Responses	**8**	**100.00 %**
Based on your experience, your general understanding, or a combination of both, how would you best describe the PMESII-PT methodology in the context of the definitions above?		
PMESII-PT is a linear methodology	4	66.67 %
PMESII-PT is a non-linear methodology	10	26.67 %
Other	1	6.67 %
Total Responses	**15**	**100.00 %**

APPENDIX C: Political Economy of Iraq in Seven Slides

POLITICAL ECONOMY OF IRAQ IN SEVEN SLIDES

21 June 2009
Version 16

POC: Frank R. Gunter PhD
Senior Economics Advisor C9 MNC-I
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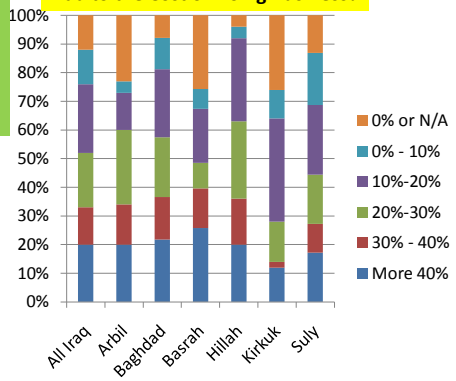
Corruption

- According to the 2008 Transparency International survey
  - Iraq is tied with Myanmar as the second most corrupt country in the world (180 countries)

- ***Perceived institutional corruption***
- ***Security organizations***
  - Iraqi Army – MOST TRUSTED
  - Iraqi Police
  - National Police
  - Border Guards – LEAST TRUSTED
- ***Governmental Organizations***
  - Local/Provincial – MOST TRUSTED
  - National – LEAST TRUSTED

How Much Does Corruption Add to the Cost of Doing Business?



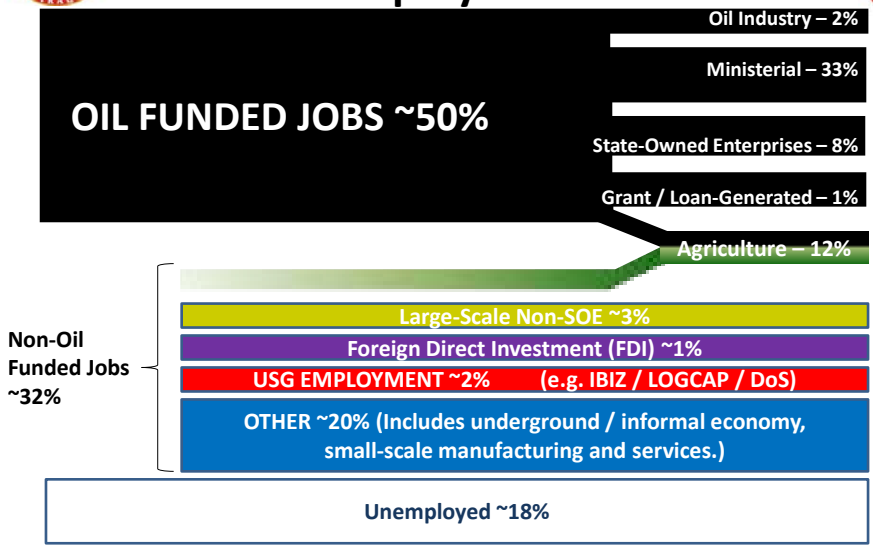
Summary: Over half of Iraqi businesses think that corruption raises costs by 20% or more. One out of five businesses think that corruption raises costs by 40% or more.

Ease of Doing Business Ranking

Legend: Green – improvement Yellow – deterioration by 5 places or less Red – deterioration by more than 5 places	Iraq 2008 Rank (2007 Rank)	Middle East Average (w/o Iraq)	Middle East Range (w/o Iraq)	USA
Overall Ranking (out of 181 nations)	**152 (141)**	**79**	**16 to 162**	**3**
1. Starting a business	175 (164)	75	22 to 134	6
2. Dealing w/ Licenses	111 (104)	93	14 to 165	26
3. Employing Workers	67 (60)	72	24 to 147	1
4. Registering property	43 (40)	79	1 to 174	12
5. Getting Credit	163 (135)	101	5 to 178	5
6. Protecting Investors	113 (107)	85	5 to 181	5
7. Paying Taxes	43 (37)	56	2 to 144	46
8. Trading Across Borders	178 (175)	75	9 to 179	15
9. Enforcing Contracts	148 (150)	118	41 to 174	6
10. Closing a Business	181 (178)	85	25 to 181	15

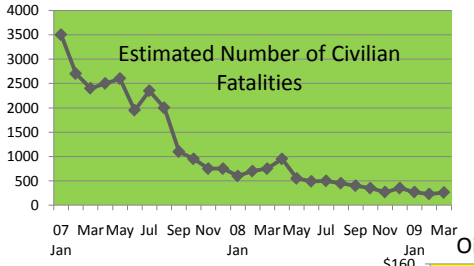
3

Iraq Employment and Unemployment Overview



4

Security and Oil

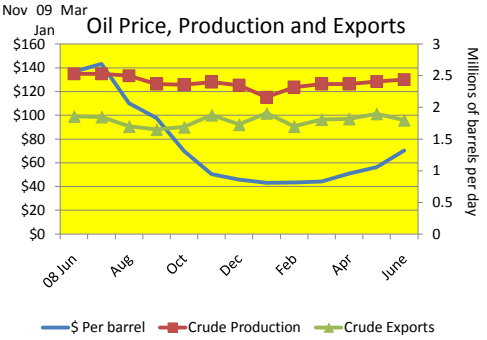


2008:

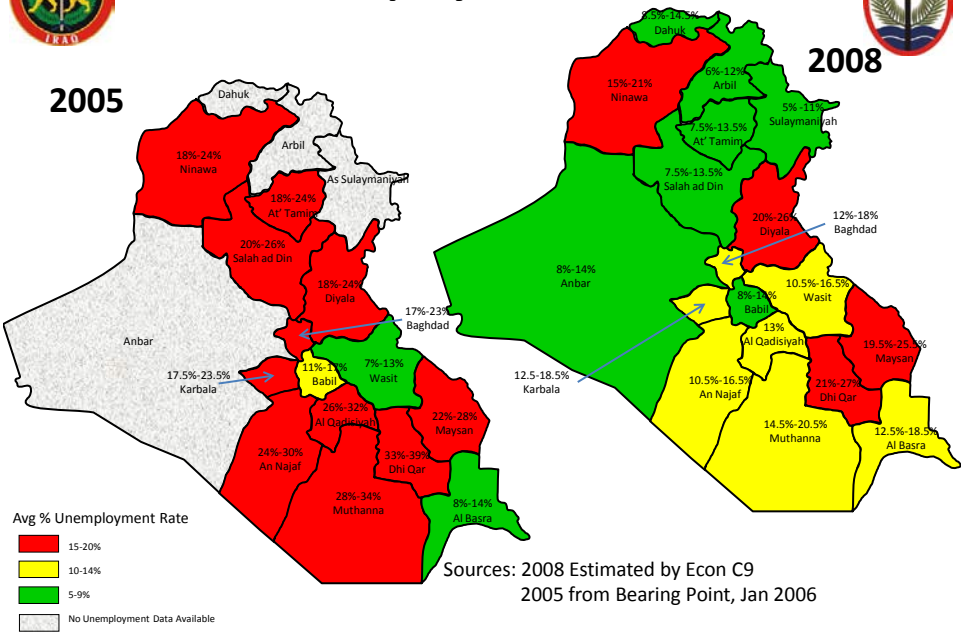
- Improved security and high oil prices led to an economic boom
- Real growth of over 9% (non-oil economy grew over 5%)
- Sharp rise in GoI spending and employment
- ***Unemployment fell to 12% - 18%***

2009/2010:

- Lower oil prices combined with only a small increase in volume of oil exports
- Constrained GoI budget , possible GoI hiring freeze
- ***250 K a year expected increase in labor force***
- Potential for sharp rise in number of unemployed young men
- Risk of increased instability



Unemployment Rates



Sources: 2008 Estimated by Econ C9
2005 from Bearing Point, Jan 2006

GOI 2008-2010 BUDGETS

	2008 GoI Budget (w/o supplemental)	2009 GoI Budget	2010 Current Oil Price Budget Scenario	2010 Worst Case Budget Scenario
World Oil Price*	$63 per barrel	$58 per barrel	$66 per barrel	$39 per barrel
Crude Exports	1.7 mbpd	1.85 mbpd	1.85 mbpd	1.85 mbpd
Total Revenue	$42.3 billion	$42.7 billion	$45.5 billion	$29.1 billion
Total Expenditures	$49.8 billion	$58.6 billion	$57.3 billion	$34.1 billion
Current Expenditures	$36.8 billion	$45.9 billion	$48.2 billion	$34.1 billion**
Investment Expenditures	$13.0 billion	$12.7 billion	$9.1 billion	Zero
Deficit	$7.5 billion	$15.9 billion	$11.8 billion	$5.0 billion
ISF Budget	$9.0 billion	$9.5 billion	$10.6 billion	$6.3 billion Salaries only

At beginning 2009, GoI had about $24 billion in budget reserves. 2010 GoI borrowing limited to $5 billion.

* Iraq nets about 10% less than the world price. 2010 Current Oil Price Budget Scenario based on 3June09 spot oil price

** Current expenditures limited to salaries, pensions, Social Safety Net, transfers to SOE, interest payments and war reparations to Kuwait. Zero new hires, no maintenance, no purchases of goods or services, zero fuel imports.

What Can Be Done to Increase Employment in 2009/2010?

- Public Sector Employment
  - Increase short-term oil exports from North
  - In the long-term:
    - Acceptance of Production Sharing Agreements
    - Increase pipeline volume to tanker loading points in South
  - Reduce GoI waste
    - Eliminate ghost workers
    - State Owned Enterprises
  - Mobilize “mattress money” by GoI bearer bonds
- Private Sector Employment
  - Reduce regulatory hostility
  - Reduce corruption (rotten apples vs. rotten barrels)
  - Mitigate drought
  - Increase foreign direct investment
  - Encourage finance for micro-small-medium enterprises
  - Reach more Iraqis with literacy, primary and skill education
  - Iraqi First (IBIZ, LOGCAP, ITN)

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