EDITOR'S PREFACE

Like the author himself, my own professional life dates back to "WWII", and participated in the intersection of operations research and the military-industrial complex in the subsequent fifty years. We are a vanishing breed. It was that thrilling time when the operational world started to pay attention to academic scientists. Speaking surely for myself, and presumptively for Dr. Rhyne, we know that our deeds during that era - unlike legal documents - are unlikely to speak for themselves. By now, any ambitions we may have had to improve the world are replaced by a residual hope that at least there remains an opportunity to give it some parting advice. I have found this book a treasure-trove of just such advice. Better yet, the details of this intriguing sea-control project supply us raw material to give ourselves advice.

The author is an unfortunately rara avis in the operations research profession - an engineer with a doctorate in political science. We more common species (with typical training in analysis and computerly arts) need some persistence to penetrate his semi-alien culture, but the rewards are ample. A sampling:

- **acculturation** - the difficulty a client has in appreciating a good analyst and his results, and the symmetric responsibility the analyst has to deal with this;
- **context** - the futility of working on a problem without reviewing how it fits into the client's operations and concerns;
- **naked emperors and generals** - what to do with perceptions that the emperor has no clothes (an example - the logical inutility of the SAGE system);
- **third world** - the kinds of problems that arise in working with third-world clients, and ways to deal with them;
- **O/R within our Department of Defense** - how the use of O/R as an internecine weapon evolved from the arrogance of the MacNamara regime, and how the residues of this misfortune still need attention.

The "guts" of the Indonesian sea control project were systematically structured by an approach called "Field Anomaly Relaxation". Watching Rhyne's meticulous, exhaustive, and conscientious application of "FAR" to the muddy problem of just what components of "sea control" were politically feasible and practically useful is a lesson in the necessity of such meticulousness, and its attendant rewards.

I cannot properly conclude this preface without apologizing to both the author and the readers for unusually long delays for which I was editorially responsible.

John D. Kettelle
May, 1995
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Preface

The Indonesian Sea Control Study of 1977 still is worth telling about.

It was distinctive in a number of interesting ways, and the lessons learned seem at least as valid now as they did in 1978. It addressed the rather spongy topic of peace-time sovereignty, rather than the crisper one of war-time control, and a new method was needed. The one invented for (and largely during) this study still seems preferable to all others for a broad, important class of strategic evaluations.

It was the first major study of any kind by the operational analysis establishment then nascent within the Indonesian Ministry of Defense and Security (HANKAM), and at the time no other team of analysts outside the US had undertaken a study of such tremendous scope.

It even went beyond standard practice in the USA, since it dealt explicitly with the subjective aspects of a politico-military mission, and that required several innovations. It made use of little-known methods of futures projection to compose patterned contexts as backdrops for intra-analytical judgments; it used psychometric scaling to get value weightings of the perceived importances of partial accomplishments of component missions; it developed an apparently sound method for designating the plausible (as contrasted with the "capabilities") threat. Above all, it wove these component techniques together within a coherent plan of work, and such internal consistency -- sound composition -- is the basic attribute possessed by all good art. And bad art, in analysis at least, produces faulty results.
There was a core study team of three full-time analysts, Lt. Col Asnawi Hassan (Navy), Major Hartun Sunjata (Air Force), and me. The Project leader, Col Subagyo (Air Force) was very active in the study. Additionally, the study team contained a number of part-time members and was guided by Air Vice Marshal Sunario. The work was done for HANKAM at its R&D Center (PUSLITBANG), of which Marshal Sunario then was Director. Preparatory steps were taken in 1976, and some dangling ends were cared for during 1978; the formal study spanned all of 1977, absorbing about five man-years of professional effort. I* served as a participant instructor.

The Sea Control Study was a key part of a program within which we tried to transfer a soft-technology -- the art and associated institutional structures of Systems Analysis -- from the US military to HANKAM. That program (in turn part of a wider effort; see Chapter 2.3 and Appendix A) had begun in late 1974, but its progress had been interdicted by conflicting images, by both donors and recipients, of what, specifically, was to have been transferred; by mid-1976 it had ground almost to a halt. The "Sea Control Study" was promoted and pursued primarily to stimulate that transfer program by offering a pilot example of what analysis could do to meet the stated desires and the needs of HANKAM's policy makers.

The study had some of its hoped-for effects. It was technically successful, it helped potential users high in HANKAM understand what analysis could and could not do for them, and it brought about ten analysts up to speed on the new methods involved. It did reinvigorate the transfer program, but that effect was only temporary -- a partial victory, at best. It did not induce the sort of institutionalization of the new analysis that was hoped for by most of those connected with the study, so in that key respect it failed.

* When personal activities and feelings seem important, I've used the first person. I've tried to use the reflexive voice only when writing about something objective.
The principal achievement, however, was unexpected. We had changed classical systems analysis so as to make it fit the needs of a less-developed, newly independent country in which interpersonal confrontation is anathema. By good luck, that produced a method of evaluation that seems superior to more standard forms of analysis whenever the strategy choice in question:

- **Will impact a variety of goals**
- To which concerned persons may assign **differing weights**.
- And will have **significant future impacts**.

So, the approach that we designed to meet a particular need seems to have turned out to fit the bill for many of the complex strategic issues faced by upper echelon executives in business and government. Perhaps its most important advance lay in its contextual discipline: within each of its three parallel evaluations, all assumptions were slaved to the designated future context for that evaluation.

This book is laid out as follows.

**Part I: Abbreviated Description**

**Part II: The Context of Our Study** tells about the local setting and explains why we undertook what we did. A later section (Chapter 3.1) treats future world/regional patterns that may be contexts for Indonesian policy making.

**Part III: Narrative** lays out what was done, task by task.

**Part IV: 1989 Retrospective** discusses lessons learned, plus ad interim improvements in techniques.
Chapter 1.1

The Character of the Study

This study was undertaken primarily as a feasibility demonstration of Program Analysis, a form of Systems Analysis in support of the policy-formulation stage of a Program Planning and Budgeting System (PPBS) similar to that in the US Pentagon in 1962. Such analysis is unique in that it takes as its subject matter -- its system of concern -- an entire program package made up of all military elements (forces, command-control, logistical support, etc.) justified in the overall military budget because of their contribution to some nationally significant mission. Any of several such missions might have served as the focus for our study; we chose that of sovereign control over Indonesia's Archipelagic Seas.

The evaluation was structured around six major components of sea sovereignty, namely: controlling smuggling, responding initially to overt invasion, enforcing traffic rules, policing fisheries, dealing with covert invasion (infiltration), and effecting air/sea rescue. It was realized that the perceived importances of these components would vary in ways that could not be logically derived, so recourse was made to psychometric scaling to expose judgmental weightings. Such valuations seemed sure to depend in part upon the context assumed; the same was true of the threat to each of the six components, and therefore to estimates of system effectiveness.

These considerations forced us to attend carefully to the relevant context, the world as seen from Indonesia during a period reaching out a decade or two into the future. Classical Systems Analysis had erred by treated the context around each system as a grab-bag of parts, from which
assumptions and model inputs might be selected as though they were mutually independent. It was imperative within the Indonesian setting that we treat the context as the quasi-organic whole which it really is. So, we made three parallel analyses, using as contexts each of three projected, internally self-consistent, future scenarios. All mission weightings, threat projections, and effectiveness estimates -- and the explicit and implicit assumptions needed in each -- were keyed to those three future patterns, one after another.

Objectives

These were the study's three main objectives, taken in descending order of their significance.

First, we hoped it would serve as a catalyst to help in effecting the transfer of a soft-technology, whereby capabilities for a desired kind of operations-analysis/systems-analysis (OR/SA) would be created within HANKAM. That program of technological transfer had been started in late 1974, but it had stuck on dead center a couple of years later, for reasons that none of us who were involved could understand at the time.

Second, it was to serve as a pilot, to show HANKAM's senior officers how analysis might help them prepare for their necessarily judgmental choices among alternative ways of combining resources from the four component services in the pursuit of a major national mission. As such, it also was to serve as a vehicle for internship training of analysts who might pursue such evaluations later on.

Third, it was to provide concrete, directly useable analytical results to those HANKAM officers who would have to choose among systems for effecting sovereign control over all of Indonesia's seas.

Scope

The breadth of this study was its most distinctive attribute, as must be the case for every legitimate case of Program Analysis, but "breadth" must be defined along several different dimensions. The ones to be considered here are:
1) Time; 2) geographic area; 3) jurisdictional spread; 4) subject matter; 5) programatic and cultural placement.

1) Time Frame: The early systems analyses (at Rand and elsewhere) usually addressed a time frame between 10 and 20 years out into the future, since they looked at systems that could not become fully operational in less than 10 years. A new sea-sovereignty system for Indonesia wouldn't call for much R&D, but it still could not see service in less than 5 years, and it would be kept for years thereafter. The time interval of concern -- the "time frame" -- for this study was set at 1980 to 1995, with a focus on 1985.

2) Area: Indonesia covers a vast area, mostly seas. (Figure 1). If its northwest tip were placed on Puget Sound, its southeasterly corner would lie in the Bahamas. Of course, it contains differing conditions and matters of concern. We had to pick a component sea region that was homogeneous, and important enough to make our work stand out.

The Natuna sea region, (Figure 2), was a natural. First, that region is interposed between central Indonesia and Indo China, an especially critical fact in 1977 in view of the then recent and shocking defeat of the USA and its South Vietnamese protege by North Vietnam. Second, Indonesia's Natuna Islands formed a natural bridge between the all-too-excellent guerrilla armies then resident in East and West Malaysia. Finally, one of the world's great sea lanes lies just to the north of the Natuna Islands, running between the Straits of Malacca and the Pacific Basin, implying multifold problems (such as smuggling, traffic violations, and air/sea disasters) for a nation claiming sovereignty over an adjacent sea region; our method had to work against just such problems.

3) Jurisdictional spread: All component services within HANKAM, plus parts of the unified command system might and
Figure 1: Indonesia, and Her Archipelagic Seas
Figure 2: The Natuna Sea
As Defined for This Sea Control Study
probably should contribute elements to any candidate sea-sovereignty systems that would be worthy of evaluation. There are four component services within HANKAM, called the ABRI when one wants to distinguish between the Ministry itself and its key parts. They are: Army, Navy, Air Force, and Police. No single service's contribution could be fairly evaluated by itself.

4) Subject matter: Our study had to involve several types of inquiry that aren't normally emphasized in OR curricula (including futures projection, value scaling, and overall system design). In partial compensation, none of the problems that surfaced during the year's study called for the use of elegant mathematical OR; that has proven true for most other military analyses as well, so it wouldn't have been newsworthy in this instance, were it not that very many Indonesian officers kept looking for "OR-type" problems.

5) The cultural and programmatic settings are discussed later.

**Effort**

The formal study lasted through all of 1977, but the core team spent several months during 1976 working on preliminaries, and report writing carried over into 1978.

The study was staffed in three echelons. The three man core team worked full-time, and the Project Leader was there more than half-time. Seven other officers worked with the core team for a few days per week, and there were a number of higher ranking officers and civilians who came together (as a senior advisory council) only when especially seasoned judgments were needed.
Results

Two representative sea control systems were laid out, within a ten-year total budget ceiling of about 25 million US dollars, including hardware purchases and closely associated costs such as logistical support and personnel. We tried to design the two systems so that each would be an actually plausible candidate for selection, so each included the sorts of compromises that are to be found in any real system.

System I followed conventional lines. In it, there was regional HANKAM command, but separate ABRI head quarters exercised command-control at lower echelons; it was made up of relatively few, individually expensive, centrally based patrol boats and other system components.

System II featured dispersal, with unified HANKAM control extending all the way down to relatively small sub-regions; it was built from more numerous but less expensive elements, such as smaller patrol boats and shore-based patrols.

Alternative lines of evolution for the world outside of Indonesia (1975-1995) were projected using a method called Field Anomaly Relaxation (See Chapter 3.2), and three of the resulting scenarios were selected to serve as contexts for three parallel evaluations of the two candidate systems.

Context X was a projected future history in which there were few changes in the 1975 pattern;

Context Y was one in which world-wide economic difficulties proved salient;

Context Z was torn by strife.

About 20 representative operational situations were laid out, and were adjusted in detail to match the estimated threat for each of the three future contexts; system performances were "determined" for each operational situation and against
its corresponding threat, through a combination of standard analytical computations and judgmental estimates.

Effectiveness estimates (estimated degrees of accomplishment of each component mission) were combined with weightings of each such mission within each context that were found through Magnitude Estimation Scaling, to arrive at what we called "benefit increments". Each was a sort of molecule of benefit, reflecting the expected worth-of-accomplishment of a component sea sovereignty mission by one of our two systems and within a designated context.

An index of net benefit was arrived at merely by adding the benefit increments for the six component missions, a simplification that's always suspect, since the whole can't really be represented just by summing its parts. Still, since the differences being inspected were not great, this sort of linear composition of net benefit ought at least to indicate the relative attractiveness of the candidate systems within each context.

*Figure 3* reflects the final results, showing System II, with its theme of decentralization, to be superior to System I in all three alternative future contexts.

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**Figure 3: Overall Results**

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<th>((\text{Benefit, Syst.II})/(\text{Benefit, Syst.I}))</th>
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<tr>
<td>X</td>
<td>1.35</td>
</tr>
<tr>
<td>Y</td>
<td>1.59</td>
</tr>
<tr>
<td>Z</td>
<td>1.79</td>
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*Note: Constant 10-year system cost, at approximately $25 million (US dollars, 1977)*

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12
Part II: The Context of Our Study

Context is the total bath of circumstance of which any system under consideration is a part and in which it is embedded. As such, a context is a social field condition, so it is an infinitely fine-grained, structured whole. Treating it as a mere assemblage of discrete parts would be, therefore, a methodological error, leading to faulty results and offering a bad example both to analyst trainees and to prospective users of analysis within HANKAM.

The extent of the field to be used as a working context depends partly on the problem at hand.

- A localized, near-term context was most relevant to the design and conduct of our program for transferring military OR to HANKAM, and that is the one to be described here in Part II.

- The context appropriate to the Sea Control Study had to be much wider -- the entire world/regional pattern around Indonesia during the next couple of decades -- since that would be the source of all threats to Indonesia's sovereignty over her Archipelagic Seas and the source, as well, of related opportunities. That context was summarized in Part I and will be considered in more detail in Part III.

Context is vitally important in Program Analysis because judgment depends crucially upon each judge's image (always uniquely personal and usually implicit) of the context, and judgment is woven deeply into each such analysis. For instance, every assumption (explicit or implicit) is an act of judgment, which is especially important to us here because assumptions usually 'wag the dog' in wide-ranging comparisons among strategies. There should be one profile of assumptions/inputs for each assumed contextual pattern, or perhaps two or three such profiles, allowing for differing inferences from that pattern. And, before lessons learned from experiences in one setting are assumed to hold true in some
other time or place, the two contexts should be shown to be similar.

Context has been vastly under-emphasized within the mainstream of analysis ever since the birth of Operational Analysis during WW II. That's strange, since one of the prime differences between military Operational Analysis and the scientific advisory services that it complemented lay in the way contextual nuances were cared for. That also was one of the prime factors that made Systems Analysis truly distinctive when it split off from Operational Analysis about ten years later.

These matters will be treated more fully in Part III, along with the view of the nature of judgment that underlies them, but briefing them here may help to explain the emphasis placed in this entire book upon context.

Very briefly, operational analysts sought to appreciate the subtleties of combat and support operations by going to live with operational units, knowingly putting their objectivity at risk by that strategy of inquiry. They dealt mostly with short-term fixes, and they got a "feel" for the context by marinating in it.

A version of Systems Analysis was invented at Rand about 10 years later to evaluate not-yet-developed weapon systems that would function in an inaccessible context 10 to 20 years in the future. The systems concept, a partial substitute for direct appreciation of a context, calls for analysts as a team to begin by gaining a feel for the complex of humans and machines (the "system") to be studied, before individual analysts split away to study parts of that system in detail. This shift toward holistic treatment was a brilliant invention, but it only went part way; the context around that system still was treated as though it were an unstructured
grab-bag of assumptions and inputs.

Our explicit treatment of context in relation to intra-study judgments by analysts was a dialectical branching, similar in kind to the earlier departures through which Operational Analysis moved beyond scientific advice and Systems Analysis moved out from OA and OR (See Part IV). But, we thought of it at the time as merely a part of an evolutionary, piecemeal improvement in classical Systems Analysis.
Chapter 2.1: The Politico-Ecological Setting

Indonesia is a big, diverse, and newly independent nation. Its nonalignment has been and is an important facet of that independence, but it never has been inflexible, tilting first toward Moscow, and then after the mid-60s toward the West. The US military assistance program, of which my activities were a small part, was warmly received, but occasionally one could sense a fleeting coolness.

The Indonesian's Revolution had barely stopped simmering by the 70s, and the preceding two decades had been busy. Their war of independence (late 40s and early 50s) was somewhat like the American Revolution, in that irregular local forces opposed a better equipped European army, but it was followed almost at once by an intense civil war. That civil war was fought (somewhat as was the one in the US) over the issue of centralized vs. decentralized power, with most of the islands other than Java favoring a federal rather than a unitary state. Many on Java also wanted decentralization, too, and on that island the fighting often divided villages in an especially violent strife something like that of the Spanish Civil War of the 30s. Only a few years later, a counter-guerrilla campaign was needed to put down a revolt by Muslim fundamentalists who wanted to make Indonesia into a theocratic state.

Of course, there were costs. There never had been many Indonesians working within the colonial civil service, but those in semi-technical branches (such as agricultural extension and the small-industries program) at least had some practice in staff work and scientific thought. Many of them had favored a gradual transition from colonial status and a decentralized national structure, which put them on the losing side. After the attrition of civil war and the related exodus of refugees, Indonesians with such experience were few indeed.
The strife was not ended with the 50s. In the early 60s, Sukarno responded to the consolidation of Malaysia (when some parts of Western Borneo were combined with the Malay Peninsula to form a single nation), by starting Confrontation -- which looked more like invasion to Malaysians. And, then came the abortive Communist coup which started with the especially brutal murder of all but two of the ranking generals of the Indonesian Army; a blood-bath followed, and those emotions had only begun to subside by the mid 70s. The Suharto Government (which followed that of Sukarno) had many wounds to salve, while maintaining a precarious order.

Ecological concerns also were surfacing by the 70s, keyed to the very rapid population growth in Eastern and Central Java. The potential impacts of that growth had been foreseen early in the century by Dutch demographers, and that had been the main impulse behind the establishment of the small-industries program that ran in Java from 1917 to 1951, with a hiatus during WW II (Rhyne, 1954)

By the 70s the adverse population/subsistence balance was no longer just a forecast. Indonesia had changed during the years since WW II from a rice-exporting nation to one of the world's biggest importers of that basic commodity. Such imports were being paid for partly by income from oil, but the country's leaders were aware that Indonesia's petroleum reserves seemed limited; mass starvation was a possibility, looking out only a few decades into the future. Naturally, efforts were being made to increase rice production by using more modern agricultural methods, but there were ominous counter-currents as well. For instance, overpopulated sections of Central Java were losing water-shed forests as people foraged ever higher for fire wood, and that threatened to reduce food production far more than scientific agriculture was likely to raise it.
Nevertheless, a centralized national state was firmly established. The new society was non-theocratic and relatively open, though the forms of representative government were only beginning to be developed by the 70s.

The culture itself of course combined all the above elements, but other, more subtle traits also affected the course of this transfer program. One was the pervasive feeling that interpersonal confrontation is the worst of all possible kinds of bad manners; others will be adduced at the points in the study process at which they became especially important.

There's another reason for waiting until the effects of such cultural traits surfaced: that was when we first learned about most of them, and I'm trying here to tell how the work unfolded rather than how I or anyone else wished it had. Many of the more muscular traits in any culture are only known implicitly by that culture's communicants and tend not to be known at all by anyone else, so I and the Indonesians who worked with me to try to establish analysis skills and institutions within HANKAM were surprised time and again by previously unnoticed differences between our two cultures.
Chapter 2.2: The Pattern Within HANKAM

The strife torn decades of the 50s and 60s of course had left their print upon the military establishment of the 70s. Most senior officers had served as guerrillas against the Dutch. Nearly all had taken a victorious part in the internal warfare of the later 50s, including some brushes with Americans who covertly helped the Medan Rebellion in Sumatra during the late 50s. I met no one with combat experience from the Confrontation with Malaysia, perhaps because of the ferociously high attrition experienced by the hundred-odd 50-man Indonesian platoons ordered into Malaysia.

In any case, HANKAM's policy makers viewed themselves as stewards of the nation whose independence they had personally helped win and secure. As one consequence, this caused them to work devotedly. As another, they tried to avoid even an appearance of greediness; there was venality, but less than might have been expected.

The latter impulse led to a side effect that had a surprising impact on our attempt to set up an analysis system in HANKAM. There had been a few years of very rapid inflation about when Sukarno's rule ended, and the new leaders decided that military salaries should be held constant, as a visible austerity move, even though living costs were doubling and redoubling. As a result, an officer's pay in 1975 ordinarily came to much less than the costs of his family's lodging or of its food. Various allowances were provided, to try to make the effective pay tolerable without actually raising salaries. The four armed services had been buying and building houses for years; they were assigned as officers' quarters in lieu of pay, and other allowances helped out with food bills.

Such allowances weren't enough, however. As a stop-gap, it became customary to give cash bonuses to officers for
taking part in studies, and the income from just a few studies per year could add substantially to a family's ease. If that customary practice were followed, a new military specialty (such as Systems Analysis) in which studies would be a continual duty rather than occasional side-activity would make its members rich. How could such a situation be handled? As of early 1979, our full-time analysts simply were not being paid extra for their on-going studies. They had to struggle along on basic pay and allowances, and only the most devoutly interested could be expected to volunteer for such work.

Also, the fact that Indonesia had barely cleared the period of turmoil after independence had a profound impact upon the concerns -- missions -- that were seen in HANKAM as being most important during the rest of the century. Hardly any military activities were thought of as being separable from nation-building, economic and political, and that made American ideas of "pure" military missions seem naive.

Of course, there are missions and missions. That word is used almost interchangeably with "assigned purpose", and it can refer to a brief operation by a single small unit or to a sweeping one that calls for long-term participation by several of the armed services. We were concerned with the latter kind -- with the few embracing missions that might properly be seen as the business of an entire military/security establishment such as HANKAM or the US DOD. Fighting an invading navy, or catching smugglers, or exposing and convicting murderers might constitute missions for component forces, but they lacked the scope and national relevancy to serve as missions for HANKAM as a whole.

One such mission had a superficial likeness to those of the DOD, namely the defense of the nation against an invader, but even it grew complicated as one inspected it closely, having as much to do with the control and logistic support of
stay-behind guerrilla forces as with combined arms using aircraft and tanks and war ships. The other missions seen to be genuinely significant by HANKAM's leaders all were heavily laced with social purposes. No official list of HANKAM missions had been constructed as of the mid-70s, but Sea Sovereignty surely would have appeared on such a roster (a).

There was another aspect of the situation within HANKAM that affected the way in which our Sea Control Study unfolded, namely the ambiguity with which many of the officers viewed the USA.

On the one hand, they saw the USA as the world's technological leader, and they saw high-tech and cultural assimilation of science as hallmark marks of "modernization"; like nearly all leaders of less-developed countries, except Gandhi, they yearned for modernity. Nearly all recipients of technological aid during the 40 years since Truman called for his "Point Four" program have acted initially as though they thought the explicit formulae and descriptions of science and engineering were all that would have to be transferred, not realizing until later that associated arts (which never can be fully described in explicit terms) are at least as important. So, Indonesian leaders, acting for a newly independent country, probably were especially vulnerable to the idea that instruction in the arithmetic of Operations Research and a study of the materials found in OR journals could provide most of what were needed to make a competent analyst.

On the other hand, however, policy makers at the top levels of authority had serious reservations concerning the practical uses of analysis, a feeling compounded of: a) hard commonsense, b) the fact that returnees from OR training Monterey still were producing very little, and c) an insightful oriental weighting of judgment and intuition over logic.
These ill-defined and usually unvoiced reservations were reinforced by the US defeat in Vietnam. It was felt by most Indonesian officers that any plausible conflict there probably would look something like that in Vietnam or like the comparable fights engaged in by ranking HANKAM officers against the Dutch and in-country insurgents. I frequently heard the comment, not as an unfriendly taunt but as a mere assertion of credentials, "We won our guerrilla and counter-guerrilla wars, but you lost yours".

Also, it must be remembered that Indonesia was not linked to the USA by any defense treaty such as NATO or SEATO, and it should have come as no surprise that many officers were reluctant to share sensitive information with any person such as myself from a country not formally allied with theirs. It was as though the fact of separateness between our two nations had to be reasserted from time to time by the withholding of bits of information.

Still, however, there were important structural similarities between conditions in HANKAM in 1975 and those in the US Office of the Secretary of Defense in 1961. In each, the law assigned sweeping authority (plus matching responsibilities) at the Ministry level, but effective power over budgets and strategy and personnel still lay with the separate services. Secretary McNamara used two linked instruments in his efforts to increase his actual control so as to make it match his legal responsibilities. They were: a) his Planning, Programing, and Budgeting System (PPBS) of which b) his Systems Analysis Office was a crucially important component.

The PPBS was seen as a mechanism for developing multi-service strategies and related budgetary assignments, from which budgets and contributory missions for the three services could be derived. The initial PPBS design was structured around multi-service "packages" of force plus their
support, with each such package keyed to a particular DOD mission. The time-phased web of activities needed to create all the physical and organizational elements of each Package and to keep it functional thereafter was called a "Program". The Systems Analysis Office reported directly to the Secretary of Defense, evaluating competing designs both of packages and programs. The PPBS changed later (and in terms of HANKAM's 1974 concerns, deteriorated), drifting away from the multi-service, mission-oriented evaluations, and toward a heavier emphasis upon the Budgeting part of its name.

In the Pentagon PPBS, however, Systems Analysis played a combative role that would be neither necessary nor tolerable in HANKAM. In the US case, the head of the defense establishment must be a civilian, and if he is to control the senior officers subordinate to him, he needs something with which to balance the weight of their experience. Secretary McNamara called on his Systems Analysis Office to supply that balance, using cost-effectiveness comparisons to counter JCS arguments that said, in effect, "Look, we've worked as professionals in this business for 30 years, and you're just a recently appointed amateur. Our experience tells us that this is what we should do". The analysts' view (and apparently that of the Secretary of Defense) was that such experiences referred to a past world that never could exist again and was, therefore, a poor guide to program planning.

So, the PPBS was designed in a way that invited confrontation between analysts and officers. The conflict was sharpened by the undoubted arrogance of some of the analysts, who quickly came to be known in Washington as the Whiz Kids because they were young and brilliant -- and brash.

In a HANKAM PPBS the need for a civilian answer to military experience would not arise, since the Minister of
Defense and Security was likely to be among the nation's most experienced officers. There'd still be a need for Systems Analysis in support of experiential judgment, to help show how changes in circumstance (including weapons technology and the ambient world situation) might change or even invalidate some lessons learned from past practice. Fortunately, however, analysts would be able to work in comradely association with staff officers and commanders, the mode of engagement that had worked best in the US and Britain ever since about 1940.

The confrontation set up in the Pentagon PPBS did match some traits within the American culture such as the adversary route toward truth and justice that is common in US courts, but it had bad effects upon military analysis in general and upon Systems Analysis even within the American setting.

- It seduced the OSD Systems Analysts into greater arrogance, reinforcing their feeling of rightness -- as conflict usually does.

- It gave analysis too high a profile. Cost-effectiveness criteria were the only ones that could be used to meet attacks on service positions by the Whiz Kids, so each service rushed to develop a capability for generating such argumentative ammunition. Unfortunately, the resulting excitement led them to place too much credence upon such criteria.

- It enraged the ranking officers whose opinions were being over-rulled, especially in view of the arrogance with which the OSD Systems Analysts so often asserted the superiority of their analytical conclusions. That fury tended to spill over on all analysts, though each service had its crew of contract analysts helping it cope with the Whiz Kid assault, a role that I played during most of 1961-63, under an SRI contract with the Army.

- It poisoned the prospects of the original version of PPBS, so that the strategic focus of that system was blurred.

In summary of this part of the argument, Systems Analysis was used as a sword in the internal Pentagon power struggle of
the early 60s, and it was seriously damaged in the process. The 1968 hearings on Systems Analysis by the Senate’s Jackson Committee focused on the role of that discipline in Pentagon, and it reads now like a postmortem.

It would have been easiest just to adopt the form and placement of Systems Analysis that existed in the Pentagon in the mid-70s (under the new name, Program Analysis and Evaluation) as our example of that which was to be transferred. The foregoing makes clear, I hope, that such a direct copying could not be seriously considered.

Notes:

a) I learned much later that the topic of sea control had surfaced often during the visits by Mr. Linsenmyer that had paved the way for my entry into the program. At each such occasion, however, sea control had been viewed from the perspective of one of HANKAM’s services. Air Force saw it as strictly an air problem, with a necessary emphasis on the surveillance portion of control; Navy, on the other hand, saw the matter as Navy business, and had produced a study that was thought to justify the creation of a small surface fleet to "control" Indonesia's Archipelagic Seas. Army and Police fixed their attentions more on activities such as infiltration and smuggling, with less attention to advanced means of surveillance and more to on-the-spot enforcement. None of the enthusiasts for sea control seems to have thought of it at that point as a unified command problem, calling for a cooperative use of assets drawn from each of the four services. More pointedly, as regards the study that we finally conducted, none of them described such inquiry as a means of enhancing HANKAM's control over the budget share assigned to each of those four services.