Effects of information quality on decision making
by Lark Elizabeth Lands

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE
Psychology
Montana State University

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Date May 10, 1980

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ON DECISION MAKING

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Abstract

An experiment was run to determine the impact of information quality on decision making. Two groups of subjects prepared embassy evacuation plans, one group using high-quality information and the other low-quality. Information quality was measured in terms of the data timeliness, accuracy, completeness, and age. The differences in quality stemmed from the presence of source data automation capabilities in the scenario used by the high-quality information group. The subjects in this group scored significantly better than those in the low-quality information group.

Introduction

The Worldwide Military Command and Control System (WWMCCS) is an information management system designed to support decision makers. A primary mission of the WWMCCS is to provide high-quality information during times of stress (CCTC, Note 1). Decision making during a crisis is complex, difficult, and usually done under severe time constraints (CCTC, Note 2). The difficulty increases with increasing uncertainty regarding events and resources (decreasing quality of information). There is a critical need during the situation assessment phase of a crisis for the provision of timely, relevant, and accurate data. In particular, the current status of available friendly forces is necessary for formulating responsive options (MITRE, Note 3).

A large effort is currently being expended on demonstrating ways in which automatic data processing (ADP) capabilities can be employed successfully in military operations. The WWMCCS ADP Utility Program has as its objective the identification and demonstration of applications of ADP which offer significant improvements in the operational effectiveness of the WWMCCS. A necessary prerequisite to meeting this objective is to develop a means of systematically measuring and evaluating the operational utility of ADP in support of crisis-oriented WWMCCS functions.

Types of ADP system measurements include system performance (capacity) measurements, measurements of the value of information provided by the system, and measurements of the utility of the system in terms of its contribution to mission objectives. The performance measurements are

relatively easy to define and obtain but are not necessarily clear indicants of system utility. Measures of information value are more difficult to obtain but are generally much better indicants of utility (Alberts, Note 4). In the past, measures of ADP utility have tended to focus on the former type, that is, performance characteristics of the hardware or software systems (e.g., instruction cycle time, storage size, etc.) rather than on the usefulness of data supplied by the ADP system in performing the operational function (Alberts, Note 4). In regard to the latter, according to Alberts there are two general hypotheses to be considered: (a) ADP capabilities will result in better information quality, and (b) better information quality will enable a user to perform a task or function more effectively. The experiment described here attempted to test the second hypothesis.

One of the most important ADP capabilities to be tested by the WWMCCS is source data automation (SDA). SDA is a collection of ADP equipment, procedures, and reports that are used to put data into a computer processable medium at the location where the data originates. Its objective is not only to provide more timely data but also to reduce the number of manual steps that may introduce errors.

In the future, it is hypothesized (MITRE, Note 5) that SDA will improve the quality of information by improving information accuracy, currency, and completeness, and by reducing data age. Data age is defined as the elapsed time from the occurrence of an event to the time it is

incorporated in the data base. Data currency is defined as the elapsed time from data update to data request. Data accuracy is defined as the combination of the qualities of precision (exactness) and correctness (minimizing data representation errors). Data completeness is defined as the combination of relevance and sufficiency of detail (MITRE, Note 6).

Theoretically, SDA will improve data accuracy and completeness by reducing the number of input errors, identifying inconsistencies, and providing the means to maintain more precise and detailed information. SDA will improve the currency and reduce the age of information by the following: (a) making it easier to enter data, thus increasing the frequency with which it is entered; (b) reducing the time it takes to enter data, thus allowing more frequent updates given the same resources; and (c) capturing data at the source, thus eliminating transcription and communication delays. Finally, SDA will improve data completeness by the following: (a) reducing the resources necessary to enter data, thus making it economical to maintain a more complete data base; and (b) providing a predetermined checklist for information requirements (MITRE, Note 5).

Thus, for purposes of the experiment to be described here, the first hypothesis, that ADP capabilities will result in better information quality, will be assumed to be true. This assumption is the basis for the differences between the two experimental scenarios used.

The second hypothesis, that better information quality will enable a user to perform a task or function more effectively, was tested. Information quality, as discussed above, is specifically defined as being

composed of data age, currency, accuracy, and completeness (MITRE, Note 5). The experiment was designed to compare the effects of two different levels of information quality on the decision making of high-ranking military personnel during times of crisis. The specific task given to the subjects was to develop alternatives and then recommend a course of action for an embassy evacuation.

One group of subjects received information like that which is generally obtained in the world today, information which, when compared to the optimum, is of low quality. Presentations at a recent conference on deployment management suggest a number of deficiencies in the response to crisis in the world today which result in such low-quality information being all that is available to decision makers (Myers, Note 7). Some of these deficiencies are summarized below (along with the data quality attributes affected): (a) Available information regarding the status of forces and materiel is of such quality as to degrade the results of the Crisis Action System (Currency, accuracy, and age are the data quality attributes affected.); (b) Some necessary information is not available because of a lack of interoperability among data systems (Completeness is the data quality attribute affected.); (c) Logistics agencies are not able to respond to critical time requirements of crises (Age and currency are the data quality attributes affected.); (d) Intelligence operations interfacing actions are not timely because they are accomplished off-line (Currency is the data quality attribute affected.)

The first group of subjects received data which reflect these deficiencies. Thus, the quality of the information given to this group is typical of the quality of the information which decision makers have to use today in dealing with crises. These and many other deficiencies will theoretically be corrected by the future implementation of SDA.

The second group of subjects received data like that which will be obtainable in the future when SDA is in general use and deficiencies such as those listed above no longer exist. Thus, the quality of information given to the second group is believed to represent the quality of information that will be available to decision makers in the future.

Experience with past crises has indicated difficulty in obtaining accurate and current status of available force information for use by unified command-level contingency support staffs. In any decision-making situation, "delayed or inaccurate information generally results in erroneous decisions and opportunity losses" (Andrus, 1971, p. 40). Andrus also states that management is "interested in information not for its own sake but rather for the benefits it may generate. Value is assigned to information according to the expected return on decisions based on that information compared to results received without the information" (p. 40). He continues by saying, "We may assume that the value of information will increase with increases in the accuracy of that information" (p. 41).

Although statements such as the above are plentiful in the literature, experimentally validated support for them is lacking. An examination of the literature of decision making quickly reveals that there is little consensus among the authors as to the characteristics of the decision process. According to Wohl (Note 8):

> Decision theorists have tended toward prescriptive definitions based on the concept of a decision as a selection from among alternatives, while commanders and corporate executives have tended toward descriptive definitions involving such statements as, "It seemed the best thing to do at the time," or "The final course of action became obvious after a while"...(p. 19).

In addition, much of the research done in the area has focused on methods for choosing correct options as opposed to looking at the part of the decision-making process which is of most interest to military commanders, "namely, the creation, evaluation, and refinement of hypotheses (i.e., What is the situation?) and options (i.e., What can be done about it?)"(Wohl, Note 8, p. 20). There was an attempt to gain information on this aspect of decision making within the context of the present research.

Wise (Note 9) states that decision theorists have failed to look at that part of the decision process which he considers most important, the "structuring activities." He says:

> ....once a decision task is "well-structured" it is painfully obvious to all involved what the appropriate course of action should be, so that no elaborate comparison of alternatives is even necessary...the bulk of thoughtful and difficult work has resided in the actual structuring of the decision situation, not in the calculations requisite for formal method... Both theory and experimentation have usually accepted [structuring activities] as a "given" and have proceeded into more tractable considerations (p. 336-338).

Wise posits an alternative view "that such a structuring process is indeed an end in itself, and should result in a strategy of action that 'emerges' as the process continues..." (Note 9, p. 339). In discussing this "emergent decision making," Wohl (Note 8, p. 21) states that "the heart of the matter is the ability to use information to quickly produce and assess the value, interactions, and consequences of alternative hypotheses and options."

Taking the observations of Wise and Wohl just discussed as a base for looking at the decision-making process, the need again becomes obvious for experimentation to establish a link between changes in the quality of information and improvements in the decision process (which will be defined here as including the generation and assessment of options). The establishment of such a link was the objective of this experiment. However, according to Alberts (Note 10), "accumulated experience does not support a simple direct linkage between the amount or quality of information and its utility."

Thus, the other factors which can affect the decision process also had to be considered. Wohl (Note 8) lists as one of the questions he considers important, "What makes some decision makers perform better than others, especially in placing high-value assets at risk in business or war?"(p. 297). The experimental scenarios attempted to simulate a crisis situation in which the subjects would feel stress as they tried to make decisions about such high-value assets (i.e., personnel and equipment).

Jervis (1976) reviewed the evidence of the importance of personal experience and historical analogies in the creation and selection of alternatives under stress. His findings indicate that people tend to focus on major salient events, rules, and "lessons learned" from past experience. Hazelwood et al. (Note 11) concur with this, suggesting that the patterns of previous crises are a strong determinant of decision making in international crises. This suggests that people's backgrounds (i.e., previous experiences and knowledge of similar situations) may be of great importance in their decision making.

Overall, as noted by Mock, Estrin, and Vasarhelyi (1972), "a major problem in developing a theory of human problem solving is that there are different effects resulting from similar information input streams due to what might be termed 'structural variables' in the mental organization of the decision maker" (p. 131). Multiple studies have been done on this aspect of decision making (Huysmans, 1968; Jensen, 1969; Schroder, Driver, & Streufert, 1967) all of which recognize that "the same information is processed differently by different decision makers and that this difference in information processing affects the decision outcomes or actions taken" (Mock et al., 1972, p. 132). In the experiment described here information was gathered on subjects' backgrounds (in particular, the areas in which they had worked) and experience levels (as reflected by rank) in an attempt to assess the possible effects of these on decision making.

The experiment attempted to empirically demonstrate the effects of changes in information quality on decision making while taking into

account the effects of individual attributes. The effects of changes in information quality were measured by looking at the quality of options developed. The quality of the option is seen as having two critical components, time requirements and incurred risk (see discussion in Procedure). It was hypothesized that the group given higher-quality information would make higher-quality decisions, as reflected in the quality of the options presented. Confidence in decisions was also measured. It was hypothesized that higher-quality information, by making the appropriate decision more obvious or clear-cut, might be correlated with higher confidence levels. The experience levels of subjects, as reflected in their rank, were assessed as to the interactions with scores. It was hypothesized that experience (which is operationally defined here as rank) would be positively correlated with decision quality. It was also hypothesized that people with certain backgrounds (e.g., operational or joint chiefs of staff assignments) would tend to make higher-quality decisions. The setting for the experimental task and the task itself were as realistic as possible.

Schroeder and Benbasat (1975) have pointed out that although

> a large number of experiments have been conducted by behavioral scientists to investigate human behavior in uncertain environments and information utilization in judgment and decision making...these experiments have analyzed information use and decision making under relatively simple conditions, and their usefulness for the purpose of [the] real world...is therefore limited (p. 558).

It is recognized that the farther an experimental setting moves from laboratory sterility toward the conditions of the "real world"

the greater are the chances of extraneous, uncontrolled variables affecting the outcome. The design of this experiment was aimed at meeting a halfway point such that both participants and observers would agree that the scenario is much like that which would occur in the world today and yet experimental controls would remain intact so that the results will be seen as valid.

Method

Subjects

The subjects were 30 military officers from different services attached to the Command and Control Technical Center (CCTC), all of whom have the rank of lieutenant or above (03-07). The subjects were randomly divided into two equal groups. One group received the high-quality information package and was called the information-rich group. The other received the low-quality information package and was called the information-poor group.

The subjects were told that they were to fill the role of the U.S. CINCEUR (Commander in Chief, U.S. Forces, Europe) Duty Officer for the South African Region in preparing an OPREP-1 which was to detail a plan to evacuate the Country Team from Gaborone, Botswana. An OPREP-1 is the operation planning report used for most communications that take place during the planning phase of time-sensitive operational procedures which support the crisis action system.

Apparatus

The subjects were given a package of information (see Appendix A) consisting of the following: instructions; a scenario about the situation requiring the embassy evacuation; a "daily intelligence summary" (supposedly the latest information available on the situation); a listing of the basic facts about the current situation; and a listing of data about locations, distances, transport times, logistics, communications, and populations. In addition, subjects were given an OPREP-1 blank and a document which contains instructions on how to fill it out. An Embassy Evacuation Plan for Gaborone, Botswana, was provided, dated nine months in the past (embassy evacuation plans are typically updated only once each year), and lacking certain pieces of information (again, typical of most such plans). The room in which the subjects worked had four maps on the wall as follows: (1) a large-scale map of Europe and Africa; (2) a jet navigation chart of the South-African Region; (3) a sectional map of Botswana and parts of Rhodesia, Mozambique, and South Africa; and (4) a Gaborone City map. The entire experimental situation was as realistic as possible.

Procedure

Each subject worked alone on the evacuation problem. Each was given the materials and told that that was all the information available. The experimenter clarified what was meant by information in the package when necessary but did not give additional information. Each subject was

assigned to either the information-rich group or the information-poor group. The specific information differences are summarized in Table 1 and are qualitatively based on the preceding discussion of the differences which will come about with the implementation of SDA. Major ships, such as aircraft carriers, would have position reporting systems using on-board source data equipment. Communication of this information via satellite or other long-range radio is an integral capability of a good SDA system. Collectors and sensors in the intelligence community with similar source data capabilities would provide the data on the airport closing, the border closing, and the status of other airports in the country.

Each subject filled out an OPREP-1 form, a background information form, and a confidence rating form. As part of filling out the OPREP-1, each subject listed three alternative courses of action for evacuating embassy personnel and marked the first, second, and third choices. Each subject was specifically told to strive for getting evacuees out as quickly as possible and with as little risk as possible.

These alternatives were scored based on the time that that option would require to get the country team out and on the amount of risk incurred. Definition of the amount of risk that would be incurred with each of the various alternatives was done using "expert" opinion, i.e., that of a retired military officer who had had extensive experience in doing embassy evacuations. The amount of time that would be required for each alternative was arrived at by a straightforward calculation using

TABLE 1

SUMMARY OF DIFFERENCES BETWEEN INFORMATION
GIVEN TO
INFORMATION-RICH GROUP AND INFORMATION-POOR GROUP

INFORMATION RICH

- Location of Aircraft Carrier Known
- Gaborone Airport Closed
- Border Closed
- No Other Airports Available

INFORMATION POOR

- Precise Location of Carrier not Known
- Nothing said About Gaborone Airport or Other Airports
- Border Closing Uncertain

distances, air speeds, number of vehicles available, number of evacuees, etc., combined with "expert" opinion on time required for loading, unloading, gathering evacuees, etc. The formula for scoring so derived was reviewed by several people with military backgrounds, all of whom concurred that the assessment of risk and the time calculations were reasonable and appropriate. The subject's first choice accounted for 70 percent of the score and the second choice for 30 percent (see Table 2). Since each subject listed three alternatives and rank-ordered them, it was considered appropriate to obtain most of the score from the first choice but to give partial credit for the second choice.

For example, one subject's plan was as follows:

(1) Option 1 -- Use helicopters to airlift 25 Marines into the embassy. Use C-141's to bring 100 Rangers to the airport. Using helicopters with Marine protection, ferry U.S. Nationals to the airport. Using C-141's, evacuate all souls to Lorenco Marques.

(2) Option 2 -- Use helicopters to airlift 25 Marines to the embassy. Use helicopters to evacuate all souls directly from the embassy to Lorenco Marques.

The plan would be scored as follows: Formula = Risk x (20-time to evacuate) x .7 = score; Option 1 = .4 x (20-6) x .7 = 3.92; Option 2 = 1 x (20-6) x .3 = 4.2; Total score = 8.12.

The background questionnaire included questions on rank, branch of service, and past experience. The subjects' ranks were grouped into three categories: junior officers (03's, i.e., lieutenants); mid-rank staff

TABLE 2

SCORING FORMULA

Risk X (20-time to evacuate) X .7 (1st COA) =

Risk X (20-time to evacuate) X .3 (2nd COA) =

TOTAL = $\sum$ _____

RISK FACTORS

1 = Embassy Pickup & Evacuation by Helicopter

.4 = Embassy to Airport by Helicopter with Protection; Evacuation by Plane

.3 = Embassy to Airport by Helicopter with No Protection; Evacuation by Plane

.2 = Drive to Airport with Protection; Evacuation by Plane

0 = Drive to Airport or Border with No Protection (Both Infeasible)

officers (04's and 05's, i.e., Majors and Lieutenant Colonels); and senior commanders (06's and 07's, i.e., Full Colonels and Generals).

The subject's confidence in the decision was obtained after the completion of the experimental task. The subject was asked to rate his confidence about the decision for the evacuation on a scale from 1 to 5, where 5 is very confident and 1 is not confident at all.

Results

The decisions for the information-rich group and the information-poor group were compared to see if the differences in information quality affected the decision process. The mean of the information-rich group (10.75) exceeded the mean of the information-poor group (5.73). This difference was significant [t (28) = 6.05, p <.001]. Thus, the quality of information strongly affected the decision processes of the subjects.

The confidence levels for the information-rich and information-poor groups were compared and the analysis showed no statistically significant difference between the groups [t (28) = .28, p >.10]. Thus, it appears that the quality of information did not affect the subjects' confidence.

A correlation analysis was performed to see if the decision scores were related to the confidence levels. Within both the information-rich group [r (13) = .44, p <.10] and the information-poor group [r (13) = .57, p <.05], there was a positive correlation between the decision score and the confidence level.

Finally, the subjects' ranks were correlated to their scores to see if those with higher military rank have higher scores. There was a

significant positive correlation within the information-rich group [r (13) = .46, p <.10] but no significant correlation within the information-poor group (r (13) = .36, p >.10]. The three categories of military rank were shown to be equally distributed among the treatment groups [t (28) = .06, p >.20]. All the major results are summarized and the raw data presented in Appendix B.

The coefficient of determination shows that 21 percent of the variation in the information-rich group's performance can be attributed to military rank.

In addition to military rank, the background questionnaire provided information on each subject's branch of service and on the type of past experience he had had. However, because of the small number of subjects and the wide disparity of the subjects' backgrounds, no meaningful statistical analysis could be performed using information on past experience. In addition, because the majority of subjects came from only one branch of service (Air Force), with only a few subjects from other branches, it was impossible to compare performances according to branch of service.

Discussion

In general, the results support the hypothesis that better information quality will enable a user to perform a task or function more effectively. Those with high-quality information were able to produce better alternatives and order them more appropriately. Thus, this

hypothesis, which has been the basis for much of the WWMCCS ADP Utility Program work, has now been experimentally tested and has yielded results consistent with the hypothesis. This experiment, of course, is limited in its scope and much further experimentation needs to be done to expand its generalizability. However, it does provide a base of knowledge that did not previously exist upon which future experimentation on the effects of information quality can be built.

The comparison of confidence levels for the information-rich group and the information-poor group indicates that, in this situation, the quality of information had no effect on the subject's confidence. This result could be interpreted as meaning that a subject's confidence level is more a matter of individual personality than the result of a particular situation. This interpretation would seem to be supported by Slovic et al. (1977), who note that in previous research they have found that "wrong answers were often given with certainty" (p. 6). This implies that even when bad information has led to wrong answers many people will be confident in their decisions.

Another aspect of the confidence factor is revealed by the positive correlation found between the score and the confidence level. There are several possible explanations for this correlation. One is simply that somehow people innately know that they have made a good decision. This seems unlikely and is contradicted by the Slovic et al. (1977) research just discussed. A more likely explanation is that those reporting generally higher confidence levels came into the experimental

situation in a more relaxed, positive frame of mind and, because of this general approach to the situation, performed better on the task.

The finding of a positive correlation between rank and score for the information-rich group and a corresponding lack of correlation for the information-poor group is of interest. Apparently, for those with higher-quality information, the extra years of experience implied by higher rank were of benefit in generating options and ordering them. However, for those with lower-quality information, it was apparently impossible to make a decision of equally high quality regardless of experience. It is evident that the extra years of experience could not make up for the detrimental effects of lower-quality information. This again implies the criticality of the quality of information for making good decisions.

In addition to using the scoring formula, a subjective comparison of subjects' answers on the OPREP-1 form was made in an attempt to see if the difference in information quality affected the way subjects generated alternatives. As previously discussed, Wohl (Note 8, p. 20) has stated that the generation of alternatives is the part of the decision-making process of most interest to military commanders. The answers were analyzed according to such things as the following: the number of considerations listed; the presence or absence of mentions of the information elements considered critical (the elements which differentiated between the high and low-quality information sets); how much

of an answer was based on assumptions made without data to support them; the assessment of risk and time factors; and the basis on which the choice of the best course of action was made. An attempt was made to find systematic evidence of elements common to the way in which options were generated and assessed by subjects (i.e., the previously discussed "structuring activities" proposed by Wise) and the effect on these elements of the quality of information. It was found that in most of these categories there were large differences between individual subjects but no systematic differences between the two groups. The most important finding of this comparison is that almost all subjects in both groups did look at both risk and time factors and used their assessment of these factors as the basis for their choice of the best course of action. Since the scoring formula is based on these factors, this would seem to validate the formula.

Subjectively, the experimental "game" appeared to be a success. The subjects made it clear by their questions and comments that they took the experimental situation seriously. It was apparent that subjects were operating under self-induced "stress" and felt a responsibility for the "safety" of the evacuees. For most subjects, professional pride seemed to exert a strong influence on their behavior. After completion of the task, many of the subjects wanted to know how well they had done and how their performance compared to that of other participants.

It must be remembered, of course, that in any "game" situation there are certain artificialities that may affect results. One is that, regardless of how carefully designed, no game will ever be quite "the real world" in the minds of participants. However, the comments of subjects made both during and after this experiment make it apparent that they did find the experimental scenario to be quite realistic and the presented problems to be representative of those often encountered in real-life situations.

There was one artificiality required by the game that subjects did not find to be realistic. This is that each subject worked alone in generating alternative solutions and deciding how to order them. As was pointed out by numerous subjects, in reality, the duty officer would be working with a group to arrive at this decision and would certainly have superiors reviewing (and possibly countermanding) any suggested solutions. Further research needs to be done to look at the effects of group decision making on this process.

Individual predilections clearly had some influence on results. The past experience of certain subjects appeared to influence their decisions. One subject, for example, walked in, read the first two paragraphs of the scenario, and announced that he did not care what the situation was; he was a helicopter man and he was going to use helicopters. Since, with this experimental scenario, the use of helicopters was,

indeed, the response that gave the highest score, the subject's predilections were of accidental benefit to him. To counter this possibility in future research, it would be of value to have each subject perform decision-making tasks using several different scenarios, none of which would require the same type of action.

The results of this experiment provide a needed base on which further experimentation can be built. One step has been made toward showing the impact of information quality on decision making. A technique for so doing has been designed, tested, and shown to be usable. Measures for assessing the impact on decision making of both the differences in information quality and the differences between individuals have been designed and have proven useful.

However, this experiment can only be viewed as a small, beginning step. The techniques and measures designed can be modified, refined, and used in future research. The lessons learned in creating this experimental scenario can be applied to developing new scenarios. The knowledge gained from the actual running of this experiment can be used to avoid future problem areas and smooth the path for future experiments.

The results point the way to certain areas of needed experimentation. In particular, it would seem appropriate to do further research on the military group decision-making process as it actually occurs in crisis situations. It would also be of interest to test for scenario dependence

by investigating the effects of using several different scenarios with each subject. Finally, of course, the study of the impact of the quality of information on decision making should be expanded and refined, with the aim of increasing the generalizability of results.

It seems clear that currently too little is known about the response to information of the persons who make decisions. If researchers wish to claim that they can develop means of assisting decision makers, then there is a clear need for further scientific study on information as it relates to decision making.

APPENDIX A

PACKET GIVEN TO SUBJECTS

SCENARIO #1

Introduction

You have been chosen to participate in an experiment. Your objective is to arrive at one (1) decision based on the information available at the time of your experiment. Your decision will be reflected in an OPREP-1 (JCS CASTOPS) for evacuating our Country Team from Gaborone, Botswana.

Please consider a minimum of three (3) clear-cut Courses of Action (COAs) which do not necessarily depend on all the same resources. Rank order your 3 COAs, marking them "1st choice," 2nd choice," and "3rd choice."

You are provided the following tools:

a. Scenario

b. Information (data)

c. Maps

d. Evacuation Plan

e. OPREP/Format

Experiment Scenario #1

For some three weeks, Botswana has been on the brink of revolution. The rebels do not like the South Africa (RSA)-backed leaders of Botswana. Newspapers have printed the Nicaragua story, and this has provided the rebels an incentive to move. Weapons are being infiltrated across the Zambian/Rhodesian borders. To make matters worse, political activities by U.S. citizens traveling around South Africa have soured the Government of South Africa (GSA) in its relations with the U.S.

Today, the U.S. Embassy in Botswana formally asked the U.S. State Department to evacuate all U.S. citizens since the Government of Botswana could no longer guarantee the safety of the U.S. Mission.

Assume you are the U.S. CINCEUR Duty Officer for the South African region. You have just received a secure phone call and "flash" message from NMCC directing CINCEUR to prepare and transmit an OPREP-1 which details a plan to evacuate the Country Team from Gaborone. The CINC directed you to write the OPREP-1 and obtain staff coordination before bringing it to him for final "Chop."

Take a few moments to review the tools, then begin.

Experiment Scenario #1

Daily Intelligence Summary - DISUM

Background

The situation in Botswana has rapidly deteriorated over the last three weeks. Rebel forces have been given new hope and inspiration by the success of Sandanista guerillas in Nicaragua. Rhodesian and Zambian sympathizers are smuggling arms and ammunition across their borders into Botswana. Government forces have not been successful in repelling the gains of the rebels. The people tend to go along with the rebels who believe the Botswana Government is merely a rubber stamp of South Africa.

Almost all foreigners have left Botswana. Two hundred Americans remain safe in Gaborone at the U.S. Embassy. Twenty-five of the 200 are members of the U.S. Marine Embassy detachment. State has requested the DoD to evacuate our people as soon as possible. Problems do exist. American citizens have been on speaking tours of South Africa and have been speaking against the government. This has soured the GSA's feelings toward the U.S. Our stand in the UN does not help matters. South Africa indicates it will not assist in evacuating our people.

Today

Botswanan rebels control all of the country except the immediate environs of Gaborone. Overnight the rebels took the Gaborone International Airport and have terminated all commercial flights in and out. Government forces have established a defense line around the city with many refugees roaming the streets in search of food.

The GSA informed our Ambassador this morning that South Africa would not help to evacuate or give asylum to any of our people. They did grant overflight rights for U.S. military aircraft.

Experiment Scenario #1

Known Current Situation:

1. USCINCEUR POLAD (STATE DEPT. REP) has provided the following information and coordination:
   a. All Americans known to be in Botswana (200) are ready to go now. All souls are assembled in the U.S. Embassy Compound.
   b. The weather is satisfactory.
   c. The Government of South Africa (GSA) has informed our Ambassador he can expect no help or asylum.
   d. The GSA has given overflight rights to US military aircraft.
   e. The Government of Mozambique (GOM) has given permission to use Lorenco Marques International Airport and its territorial waters for our evacuation purposes.
   f. U.S. Embassy has requested 25 additional troops for evacuation security.
2. USCINCEUR Intelligence Staff officers have provided the following information and coordination:
   a. Rebels are in command of Gabarone International Airport.
   b. No flights are being allowed in or out and no POL is available.
   c. All navigation aids are still operating.
   d. No other Botswana Airfields are suitable.
   e. Rebels have closed the RSA/Botswana border.
3. CINCMAC (Supporting Command) has provided the following information

and coordination:

a. Six USAF C-141s are on the ground at Lorenco Marques, Mozambique.

b. One hundred U.S. Army Rangers are a part of the C-141 Task Force prepositioned at Lorenco Marques.

c. Two C-141s will be required to lift the 200 Americans from Gaborone.

d. The C-141 can operate from the 6000' airport at Gaborone at 3210 altitude using a partial fuel load plus 100 passengers each plus hand baggage.

e. The U.S. Embassy has a suitable helipad.

4. CINCPAC (Supporting Command) has provided the following information and coordination:

a. The helicopter carrier, USS Antietam, is anchored off the Coast of Mozambique.

b. USS Antietam has 30 "Jolly Green" helicopters capable of aerial refueling.

c. A U.S. Marine Battalion Landing Team (BLT) is on board.

d. A U.S. Navy Carrier Task Group (CTG), USS Enterprise, is proceeding to rendezvous with the Antietam.

e. Eight helos required for 200 people.

f. CH-53 cruises between 150-160 K.

g. CH-53 can carry 25 passengers plus hand baggage.

h. CH-53 endurance with 650 gal. external tanks is about 5 hours.

Experiment Scenario #1

Other Data:

1. Locations:

   a. U.S. EMBASSY GABORONE - 25°55'E.
      24°39"S.

   b. GABORONE INT'L AIRPORT - 25°56'30"E.
      24°39'30"S.

   c. USS ANTIETAM - 32°00'E.
      26°40'S.

2. Distances:

   a. AIR TO PRETORIA - 137 N.M.

   b. AIR TO LORENCO MARQUES - 375 N.M.

   c. AIR TO USS ANTIETAM - 420 N.M.

   d. EMBASSY TO GABORONE
      INT'L APRT - 1-1/2 S.M.

3. Times:

   a. R/T to LORENCO MARQUES BY HELO - 6-1/2 HRS includes A/R and P/U.

   b. R/T to USS ANTIETAM BY HELO - 7 HRS includes A/R and P/U.

   c. R/T to LORENCO MARQUES BY C-141 - 2-1/2 HRS including P/U.

   d. Embassy to Gaborone Int'l Aprt by Bus - 5'.

4. Logistics:

   a. Eight helicopters required for 200 evacuees.

   b. One helicopter required for 25 marines.

c. Two C-141s required for 200 evacuees.

d. Two C-141s required for 100 rangers.

e. No POL available in embassy compound.

f. Emergency rations adequate in embassy.

g. Helos (organic) will provide A/R.

h. Embassy vehicles are in compound.

i. Embassy aircraft (C-12) impounded by rebels.

5. Communications:

a. Embassy

1. Telephone to Pretoria.

2. Teletype to Pretoria

3. HF radio/teletype

4. FM radio - GRD/air

5. Mobile Comms - eight hand sets

6. Population:

a. Gaborone - 10,000

SCENARIO #2

Introduction

You have been chosen to participate in an experiment. Your objective is to arrive at one (1) decision based on the information available at the time of your experiment. Your decision will be reflected in an OPREP-1 (JCS CASTOPS) for evacuating our Country Team from Gaborone, Botswana.

Please consider a minimum of three (3) clear-cut Courses of Action (COAs) which do not necessarily depend on all the same resources. Rank order your 3 COAs, marking them "1st choice," "2nd choice," and "3rd choice."

You are provided the following tools:

a. Scenario

b. Information (data)

c. Maps

d. Evacuation Plan

e. OPREP/Format

Experiment Scenario #2

For some three weeks, Botswana has been on the brink of revolution. The rebels do not like the South Africa (RSA)-baeked leaders of Botswana. Newspapers have printed the Nicaragua story, and this has provided the rebels an incentive to move. Weapons are being infiltrated across the Zambian/Rhodesian borders. To make matters worse, political activities by U.S. citizens traveling around South Africa have soured the Government of South Africa (GSA) in its relations with the U.S.

Today, the U.S. embassy in Botswana formally asked the U.S. State Department to evacuate all U.S. citizens since the Government of Botswana could no longer guarantee the safety of the U.S. Mission.

Assume you are the U.S. CINCEUR Duty Officer for the South African Region. You have just received a secure phone call and "Flash" message from NMCC directing CINCEUR to prepare and transmit an OPREP-1 which details a plan to evacuate the Country Team from Gaborone. The CINC directed you to write the OPREP-1 and obtain staff coordination before bringing it to him for final "Chop."

Take a few moments to review the tools; then begin.

Experiment Scenario #2

Daily Intelligence Summary - DISUM

Background

The situation in Botswana has rapidly deteriorated over the last three weeks. Rebel forces have been given new hope and inspiration by the success of Sandanista guerillas in Nicaragua. Rhodesian and Zambian sympathizers are smuggling arms and ammuniton across their borders into Botswana. Government forces have not been successful in repelling the gains of the rebels. The people tend to go along with the rebels who believe the Botswana Government is merely a rubber stamp of South Africa.

Almost all foreigners have left Botswana. Two hundred Americans remain safe in Gaborone at the U.S. Embassy. Twenty-five of the 200 are members of the U.S. Marine Embassy detachment. State has requested the DoD to evacuate our people as soon as possible. Problems do exist. American citizens have been on speaking tours of South Africa and have been speaking against the government. This has soured the GSA's feelings toward the U.S. Our stand in the UN does not help matters. South Africa indicates it will not assist in evacuating our people.

Botswana rebels control a good portion of the country and are preparing for an eventual assault on Gaborone. Government forces have established a three-ring defense line around the city. Gaborone is a tense and nervous capital with many refugees roaming the streets in search of food and a place to sleep.

The GSA informed our Ambassador this morning that South Africa would not help to evacuate or grant asylum to any of our people. They did grant overflight rights for U.S. military aircraft.

A few minutes ago, DIA sent an update which indicates the ground situation is very fluid around Gaborone. The rebels may have closed the border between Botswana and South Africa.

Experiment Scenario #2

Known Current Situations:

1. USCINCEUR POLAD (STATE DEPT. REP) has provided the following information and coordination:
   a. All Americans known to be in Botswana (200) are ready to go now. All souls are assembled in the Embassy Compound.
   b. The weather is satisfactory.
   c. The Government of South Africa (GSA) has informed our Ambassador he can expect no help or asylum.
   d. The GSA has informed the USG that it will not oppose overflight by U.S. military aircraft.
   e. The Government of Mozambique (GOM) has given permission to use Lorenco Marques International Airport and its territorial waters for our evacuation purposes.
   f. U.S. Embassy has requested some additional troops for security purposes.
2. USCINCEUR Intelligence staff officers have provided the following information and coordination:
   a. Six USAF C-141s are on the ground at Lorenco Marques, Mozambique.
   b. One hundred U.S. Army Rangers are a part of the C-141 Task Force prepositioned at Lorenco Marques International Airport.
   c. Two C-141s will be required to lift the 200 Americans from Gabarone.

d. The C-141 can operate from the 6000' runway at Gaborone and 3210' altitude by using a partial fuel load plus 100 passengers each plus hand baggage.

e. The U.S. Embassy has a suitable helipad.

4. CINCPAC (Supporting Command) has provided the following information and coordination:

a. The helicopter carrier, USS Antietam, is steaming toward the Coast of Mozambique (ETA is 5 hours from now).

b. USS Antietam has 30 "Jolly Green" helicopters capable of aerial refueling.

c. A U.S. Marine Battalion Landing Team (BLT) is onboard.

d. A U.S. Navy Carrier Task Group (CTG), USS Enterprise, is proceeding to rendezvous with the Antietam.

e. Eight HELOS required for 200 people.

f. Cruises between 150-160 k.

g. CH-53 can carry 25 passengers plus hand baggage.

h. CH-53 endurance with 650 gal. external tanks is about 5 hours.

Experiment Scenario #2

Other Data:

1. Locations:

   a. U.S. EMBASSY GABORONE - 25°55'E.
   - 24°39"S.

   b. GABORONE INT'L AIRPORT - 25°56'30"E
   - 24°39'30"S

2. Distances:

   a. AIR TO PRETORIA - 137 N.M.

   b. AIR TO LORENCO MARQUES - 375 N.M.

   c. EMBASSY TO GABORONE INTERNATIONAL AIRPORT - 1 1/2 S.M.

3. Times:

   a. R/T to LORENCO MARQUES BY C-141 - 2 1/2 HRS Including P/U.

   b. Embassy to Gaborone International Airport by Bus 5'.

4. Logistics:

   a. Eight helicopters required for 200 evacuees.

   b. One helicopter required for 25 marines.

   c. Two C-141s required for 200 evacuees.

   d. Two C-141s required for 100 rangers.

   e. No POL available in Embassy compound.

   f. Emergency rations adequate in embassy.

   g. POL available at airport.

h. Embassy vehicles are in compound.

i. Embassy aircraft (C-12) at Gaborone International Airport.

5. Population:

a. Gaborone - 10,000.

1 February 1979

U.S. EMBASSY

GABORONE, BOTSWANA

EVACUATION PLAN

TASK ASSIGNMENTS AND ORGANIZATION

1.	AMBASSADOR	MARTIN I. SLOANE
2.	DEPUTY CHIEF OF MISSIONS	CHARLES E. STARNES
3.	EMERGENCY/EVACUATION COMMITTEE	JOSEPH O. GLOTZ
4.	TASK GROUPS	
	a. DEPUTY	CHARLES E. STARNES
	b. WARNING AND DOCUMENTATION	RICHARD J. FALKE
	c. CIVILIAN LIAISON	SWENSON O. GIBSON
	d. INTELLIGENCE AND LIAISON	WILLIAM A. TIDWELL
	e. ADMINISTRATION	HAROLD H. DAVIDSON
	f. SUPPLIES AND EQUIPMENT	JAMES R. CLIFFORD
	g. MOVEMENT CONTROL OFFICER	GEORGE A. GREGORY
	h. INTERNAL DESTRUCTION	ROGER R. RIPPITOE
	i. COMMUNICATION	ARTHUR T. TELEPHONE

ANNEX A

APPENDIX I

EMERGENCY EVACUATION COMMAND CENTER

a. STAFF

b. DUTIES

ANNEX A

APPENDIX IV

INTELLIGENCE AND LIAISON TASK GROUP

WILLIAM A. TIDWELL

ANNEX A

APPENDIX VIII

INTERNAL DESTRUCTION TASK GROUP - ROGER R. RIPPITOE

STAFF DUTIES:	UNDER WARNING	UNDER NUMBERED PHASE

ANNEX A

APPENDIX IX

COMMUNICATIONS TASK GROUP

ARTHUR T. TELEPHONE

ANNEX C

NUMBERS/LOCATION OF POTENTIAL EVACUEES AS OF 0800 Z

	#	LOC
a. DoD	150	
b. DEPENDENT	100	
c. USG	100	
d. AMERICAN RESIDENTS	0	
e. TOURISTS (1, 2, 3, & 4th QTRS)	0	
f. OTHER	2	____
TOTALS:	350	