Technical Report 833

Measurement and Evaluation of Military Intelligence Performance

John Thompson, Betty Landee-Thompson, Theodore Fichtl, and Leonard Adelman
Science Applications International Corporation

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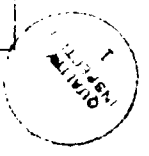

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The report describes the first phase of a 3-year research effort to develop a method for measuring the effectiveness of military intelligence (MI). Although the Army uses a number of evaluation methods, there are no methods appropriate for assessing the effectiveness of specific MI tasks and processes. To develop appropriate methods, researchers collected data through interviews and multi-attribute utility assessment and developed profiles of effective MI outputs. The profiles form the basis for a measurement instrument. In the next phase of research, a fault diagnosis methodology will be developed to trace failures in the output to causes in the MI process. In the final phase, the methodologies will be validated. A supplemental report (Working Paper HUA 88-03) describes the project rationale and additional results of interest to the military community.

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Human Factors in Training and Operational Effectiveness

FOREWORD

A concern of the U.S. Army Intelligence Center and School (USAICS) is the development of methods for evaluating military intelligence (MI). The Army uses a number of methods to evaluate soldier performance, including the Skill Qualification Test (SQT) and the Army Training and Evaluation Program (ARTEP). These methods, however, are designed to evaluate generalized soldier skills rather than tasks and processes specific to MI. The current effort will develop a method for evaluating the functional effectiveness of MI that will complement the SQT and ARTEP. The method will consist of two components: an instrument that will assess the output of MI in terms of its utility to intelligence users and a fault diagnosis technique that will trace failures in the output to causes within the MI process. The report describes the development of the first component.

This research was conducted within the Fort Huachuca Field Unit of the U.S. Army Research Institute under a contract to Science Applications International Corporation. The project was sponsored by the Directorate of Training and Doctrine, U.S. Army Intelligence Center and School in a Letter of Agreement dated 14 March 1986. The results of the research were provided to the sponsor; the Directorate of Combat Developments, USAICS; and the Commander, U.S. Army Intelligence Agency. When completed, the measurement tool will be used in tactical training exercises.

EDGAR M. JOHNSON
Technical Director

ACKNOWLEDGMENTS

The research team is grateful to the U.S. Army Research Institute technical contract monitors for this effort, Ms. Jo Hall and Dr. Julie Hopson, for their assistance, guidance, insights, and continued enthusiasm. We would also like to thank Dr. Dave Burnstein of the U.S. Army Intelligence Center and School for his continued support and assistance.

The value of this effort would have been greatly reduced without the cooperation of active-duty division staff officers. We are extremely grateful to those division staff officers at Fort Bragg, Fort Stewart, Fort Lewis, and Fort Carson who gave freely of their time and insights. We are also indebted to the intelligence personnel at each location who coordinated the site visits.

We are grateful to the officers at Fort Leavenworth who willingly spent so much time preparing for and attending the multi-attribute utility assessment (MAUA) decision conference. Their task was substantial and their contribution to this effort was of tremendous value. Our thanks to Major Sullivan and Dr. Stanley Halpin at the ARI Fort Leavenworth field unit for obtaining participants and hosting the conference.

The team is grateful for the support of George Mason University faculty members Dr. Paul Lehner and Dr. Stephen Andriole.

We are appreciative of the Science Applications International Corporation (SAIC) personnel in Sierra Vista, Arizona, for pretesting survey questionnaires. The research team is grateful to Mr. Don Blascak for providing valuable insights throughout this effort.

We are grateful for the efforts of SAIC personnel Dr. Mark Archer and Ms. Bethany Drum for their technical contribution during the first year of this research effort. The team is especially thankful for the technical editing of this report provided by Ms. Nora Trentman.

MEASUREMENT AND EVALUATION OF MILITARY INTELLIGENCE PERFORMANCE

EXECUTIVE SUMMARY

Requirement:

The objective of this research is to develop and validate a measurement method for evaluating the effectiveness of Military Intelligence (MI). The research is a 3-year effort. The first year of the research is the subject of this report.

Year 1 of this research effort focused on bringing the perspective of the intelligence user into the evaluation of MI. During Year 1, we identified the range of issues associated with the assessment of MI and developed a basis for a measurement instrument using multi-attribute utility assessment (MAUA).

Procedure:

A variety of data collection techniques were used during the first-year research. Techniques included individual interviews, multi-attribute utility assessment (MAUA), and survey questionnaires.

Individual interviews were conducted for the following reasons: (1) to identify and define factors associated with an intelligence user's view of outputs provided by intelligence, (2) to identify sources of variation in a user's utility assessment, and (3) to identify discrete elements of information content needed by intelligence users and the sources of variation in these needs.

MAUA was used to quantify intelligence user utility. The procedure followed the basic MAUA implementation steps and completed the following in Year 1: (1) defined the decision problem, (2) identified and ordered the factors to be used in evaluating alternatives, and (3) elicited relative importance weights for elements and nodes in the hierarchical order.

A survey questionnaire was developed and used to assess military intelligence products. Objectives of the survey were the following: (1) to determine whether an intelligence product orientation was too narrow a focus in this research, and (2) to assess and compare the perspective of users regarding doctrinal and nondoctrinal intelligence products.

Findings:

From the first year of research we have concluded that the effectiveness of MI is directly related to how useful the MI output is to the user. Assessing the effectiveness of MI without consideration of the user utility of intelligence outputs is too narrow a focus.

The application of MAUA in this effort produced a hierarchy of user information needs that (1) reflects the needs of different types of users (e.g., G3, G2, G4, FSC), (2) can be weighted by users to reflect the relative importance of the information items, and (3) discriminates information needs of various contexts (e.g., peacetime, wartime).

The survey of intelligence products provided two major conclusions. First, a product orientation as defined by intelligence doctrine is not sufficient for this research. Second, intelligence users recognize and assign high utility to many intelligence outputs that are not identified by intelligence doctrine as products. In light of the survey findings, the general term "output" was adopted to connote any output from intelligence to the user.

Utilization of Findings:

The information needs hierarchy can be viewed as a data base of information needs to which user utility can be applied. We see two potential applications for the data base. One application is the development of profiles for classroom evaluation of student-generated output. A profile would essentially be a weighted data base of information items represented by the information needs hierarchy. This would permit instructors to employ a user-specific, situationally dependent profile to represent a "mythical G3" against which student-generated intelligence output could be assessed. A second application of the data base of information needs is for assessing the performance of MI effectiveness in a dynamic setting such as a field exercise. Both applications of the data base require the development of a scoring approach, one topic of research for the second year of this research effort.

The second year of this research effort will be concerned with the development of the process corollary to user utility. A major future direction for this research is to trace user utility into the intelligence process in an effort to identify the sources of low user utility and develop remedies for utility shortfalls.

The third year of this research effort will be concerned with validation of both the measurement instrument and the diagnostic procedure for tracing user utility into the intelligence process.

MEASUREMENT AND EVALUATION OF MILITARY INTELLIGENCE PERFORMANCE

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MEASUREMENT AND EVALUATION OF MILITARY INTELLIGENCE PERFORMANCE

INTRODUCTION

Overview

This report presents the technical progress for the first year research of the three-year research program entitled "Measurement and Evaluation of Military Intelligence (MI) Unit Information Processing Performance." The program began in September 1986 under the sponsorship of the U. S. Army Research Institute and the U. S. Army Intelligence Center and School. The research under this project is being performed by Science Applications International Corporation (SAIC) with support from George Mason University.

The intent of this research effort is to develop a methodology for evaluating military intelligence effectiveness. This report describes the problem, our approach, results, and future plans. It is one of two concerning this research effort. A supplemental report is available that is oriented toward the military audience of this research. The following report is designed primarily for an audience interested in the technical rather than military aspects of the research.

The Army Need

Military intelligence (MI) units and staff elements have several instruments available to them for measuring individual and unit performance. The Skill Qualification Test (SQT) measures individual task/skill competency for a given Military Occupational Specialty (MOS). Similarly, the Army Training and Evaluation Program (ARTEP) provides standards for unit task/skill competency. From the MI perspective, the combination of the SQT and ARTEP provides some

measure of performance of an MI unit, but not the complete picture. As shown in Figure 1, there is a missing component of effectiveness evaluation that assesses the complete functionality of the MI infrastructure.

This research effort intends to fill in that missing component in the effectiveness equation with a measurement instrument that allows MI to assess its functional effectiveness. We are not developing an approach to assess an individual intelligence analyst -- that is the domain of the SQT. Nor will we duplicate unit task competency measurement as specified in the ARTEP.

The Problem

Possibly the most difficult problem challenging researchers in this effort is the determination of what constitutes effectiveness for MI. To some people the ultimate measure of MI effectiveness is whether a war is won or lost. From a measurement standpoint, isolating the MI contribution to mission success is exceedingly difficult to measure due to a large number of confounding variables. An individual who is currently serving as a division Assistant Chief of Staff for Intelligence phrased his view of MI effectiveness in this manner:

> Intelligence reporting is not rote and the success of intelligence reporting is not measured by pages produced but rather in lives saved or lost. Good analysts and good analysis is not pontification but a usable, credible product...

While the title of this study concerns MI unit effectiveness, our approach is more accurately described as a measurement of MI ineffectiveness. We are attempting to isolate the faults in MI, not the strengths. Further, we are looking at

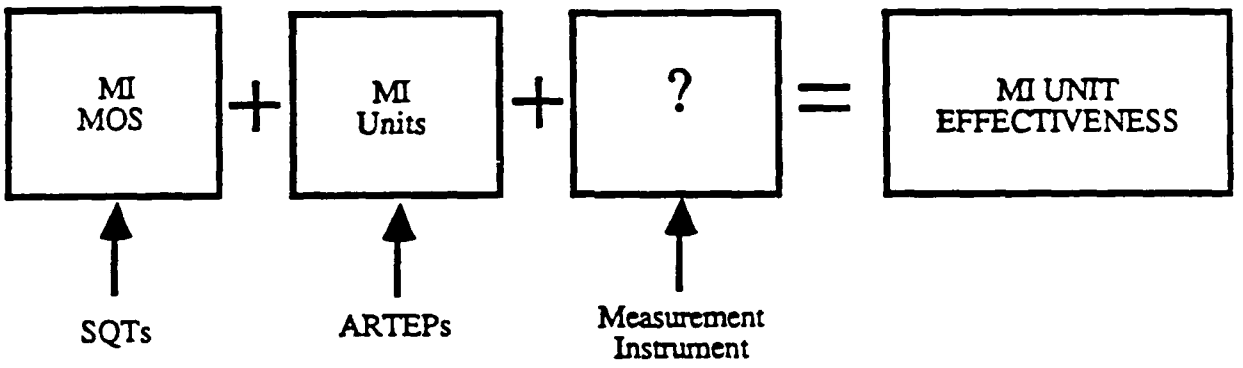

Figure 1. Measurement of MI unit effectiveness.

the faults from the perspective of those supported by MI, those who rely on intelligence to provide them with information about the opposing force and battlefield area.

Objective

The objective of this research effort is to develop and validate an instrument suitable for evaluating the performance of a tactical MI "unit" which includes the essential staff supporting elements. During the first year of the research we sought to identify the range of issues associated with the assessment of MI, focus the research for the instrument development, and develop and apply an approach to the instrument development.

APPROACH

Overview

Year 1 of this research effort focused on the development of an understanding of intelligence output utility from the perspective of the intelligence user. Measuring the utility of MI outputs involves understanding a complex set of factors. Any single technique would run the risk of failing to identify some key factors and developing only a partial understanding of the problem. To avoid missing potentially important factors this project employed a variety of data collection techniques, including: individual interviews, Multi-Attribute Utility Assessment (MAUA), and survey questionnaires. These techniques were used along with a supporting research base developed by the project team. Figure 2 provides an overview of the multifaceted approach to Year 1 of this research effort.

Each technique employed in this research effort had specific objectives. The use of individual interviews had three primary objectives: (1) identify and define those factors associated with a user's view of the utility of outputs provided from intelligence, (2) identify sources of variation in a user's utility assessment, and (3) identify discrete elements of information content needed by intelligence users and the sources of variation in these needs. The technique of MAUA was directed toward the development of a metric to be used in the training environment to assess intelligence products. A questionnaire about the use of the military intelligence products focused on two objectives: (1) determining whether an intelligence product orientation in the study was too narrowly focused; and (2) assessing and comparing the perspective of users regarding doctrinal and non-doctrinal intelligence products.

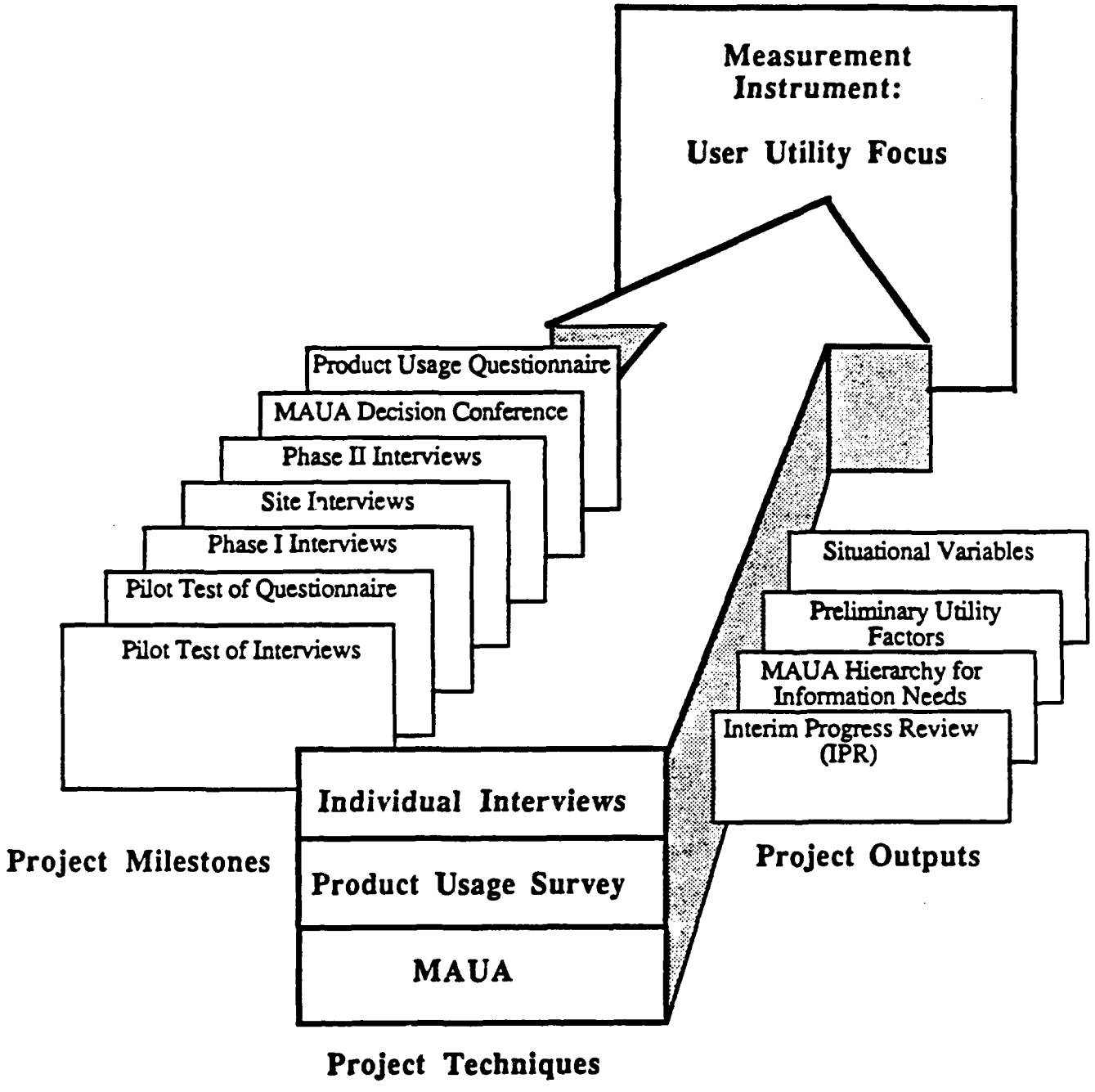

Figure 2. Overview of Year 1 research approach.

The following sections discuss each technique used in this research. Additionally, the advantages and disadvantages of each technique are identified.

A Proposed Utility Framework for Evaluation of MI Effectiveness

This research developed an orientation toward utility as the underlying base of MI effectiveness from a simple model of intelligence. MI produces intelligence, puts the intelligence into a variety of possible forms, and gives the intelligence to a user. The question is, how do you measure the effectiveness of what the unit is doing? The measurement problem converged on the concept of utility because it can be related to the intelligence process, to output forms, and to users. The intelligence process is concerned with utility because of the need to focus scarce resources (analysts, time, sensors, and sources) in a way that produces high utility output. Users want and need high utility outputs from intelligence and want to minimize time and effort to use those outputs.

Early in our research, it became apparent that the study of MI effectiveness was a question of "When is what MI produces useful to the user?" The user perspective had to be included to address MI effectiveness. It also became apparent that this restatement of the problem reflected a complex series of questions: "What does MI produce?; What factors make it useful? Who are the users? Over what period do you measure performance?" A utility framework was selected for looking at MI effectiveness because it provided for quantifying subjective notions of usefulness as perceived by the user. Utility also dealt with a qualitative and quantiative view of information and relevance. Our utility framework identified three areas of focus as illustrated in Figure 3.

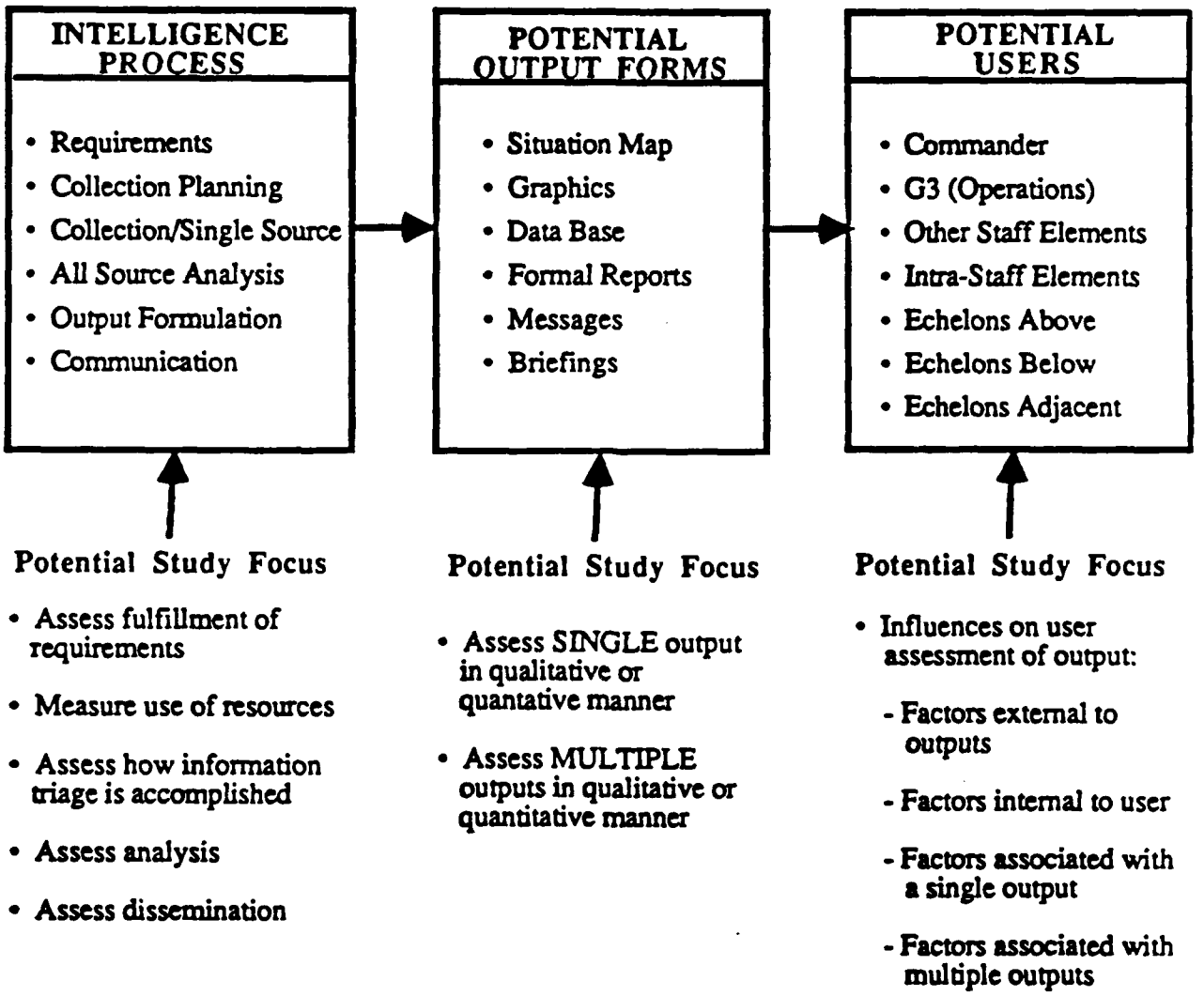

Figure 3. A proposed utility framework for evaluation of MI effectiveness.

Year 1 of this research has focused on developing the user perspective of the utility of intelligence outputs and developing a methodology for bringing that perspective into a measurement instrument to apply to outputs. Primarily, this study focused on the factors that influence a user's assessment of intelligence output. Factors studied included: those external to the user, those associated with a single output, and those associated with multiple outputs. Factors internal to the user are concerned with biases including: organizational biases, personal biases, and cognitive biases. Internal factors, although representing viable influences on user assessment, were considered outside the scope of this research.

Individual Interviews

The purpose of the individual interviews in this effort was to bring the perspective of the intelligence users into the research. Interviews provide a rich source of information and a means for identifying the general range of issues involved in the problem. Interviews with subject matter experts (SMEs) provide a way of building a basic conceptual framework, which can be refined in subsequent interviews. Interviews provide a good method for developing an initial understanding of the problem and structure of the concept space, without undue influence of preconceived notions of the researchers. Anecdotal information obtained in interviews helps to characterize the nature of a problem and allows analogies to be drawn to other domains. Finally, interviews provide a good check to ensure that important issues are not overlooked.

There are several disadvantages to individual interviews. For one, interviews are relatively time consuming to conduct and analyze. Typically,

interviews are conducted with a relatively small sample of SMEs, raising a question about the generalization of the findings. The results of interviews are generally described in qualitative terms that do not lend themselves well to the development of a rigorously quantitative metric. While individual interviews provide valuable insights into the problem, the interviews alone cannot develop the type of quantitative metric desired from this project.

Interview Population

Active-duty Army staff officers appeared to be the optimal SME target, but constraints on their availability was a factor in limiting their use. For this reason, individual interviews were conducted with in-house personnel who recently retired from an Army operational assignment to supplement interviews with active-duty personnel.

Eight individuals within SAIC were identified who had recently retired from the Army with operations backgrounds. The experience of these individuals included corps, division, and brigade echelons serving in the roles of commander, G3, assistant G3, and S3. Primary specialties of the interview participants included: infantry, field artillery, armor, combat engineering, chemical, and combat communications. The advantage of using in-house participants included: (1) time constraints were not placed on our use of these individuals, and interview sessions could be conducted for significantly longer periods of time than possible with active-duty Army staff officers; and (2) clarification questions and followup interviews were easily accomodated using in-house personnel.

The research team was given access to numerous active-duty Army staff officers from various continental U.S. (CONUS) divisions. Various sites were visited and individuals currently serving as division staff officers. Personnel interviewed included the following division staff functions: G3, G3Plans, G3Ops, Chemical, FSE (Fire Support Element), G2 (Intelligence), and G2Plans.

Protocol Development

The purpose of individual interviews was to identify the range of concerns of operations users in regard to intelligence products. Typically, the results of one set of interviews served as a guide to establishing new objectives for the next round of interviews. In this manner, the interview protocols varied with the objectives of the interviews. Table 1 provides an overview of the objectives for each series of interviews. While interview objectives differed, the approach to individual interviews followed a consistent pattern: draft protocol, pre-test; conduct interviews, analyze data, and revise protocol for next interview set.

In-house interviews were conducted in two phases. The first phase of interviews consisted of open-ended questions looking into a range of general issues related to an operations user's view of intelligence outputs. In particular, the interviews sought to identify a user's information needs for specific contexts, such as peacetime and active hostilities, in an attempt to determine if information needs were context independent or context dependent. In addition, interview participants were queried to identify factors associated with good intelligence. These factors were used in the second phase of in-house interviews when participants were asked to rate both information types and factors. Appendix A contains the protocols used

TABLE 1. Individual Interviews: Summary of Objectives

INTERVIEW LOCATION	OBJECTIVE
In-House	
Phase I	Identify factors that influence the usefulness fo intelligence outputs. Identify user information requirements in two different situational contexts. Elicit opinions regarding ways to improve intelligence.
Phase II	Obtain importance ratings of factors that influence the usefulness of intelligence outputs for different situational contexts. Obtain importance ratings of information types in different situational contexts.
Site Visits	
Fort Bragg	Elicit important user tasks performed and associated information requirements from intelligence. Elicit factors that influence information needs. Elicit factors that influence user confidence in information/intelligence.
Fort Stewart	Identify changes in information needs related to situation context and user task. Identify factors that influence the usefulness of intelligence.
Fort Lewis	Confirm previously identified factors that influence user assessment of the utility of intelligence outputs. Obtain definitions of utility factors.

for the in-house interviews. In-house interviews were conducted at various times throughout the first year effort.

Site visit interviews were conducted at three Forces Command (FORSCOM) division locations. At division staff officers were interviewed individually. The first site visit, to the 82nd Airborne Division at Fort Bragg, used a scenario-based protocol in which user tasks and their respective information needs from intelligence were identified. Additionally, participants interviewed were asked to identify factors that influence their confidence in the information they receive as well as factors that influence the kind of information needed.

The second site visit was made to the 24th Infantry Division (Mechanized) at Fort Stewart. The protocol differed substantially from the one used at Fort Bragg. The major difference in this protocol was that it required recognition rather than recall on the part of interview participants. Participants were given a task list (prepared in advance for each individual role) as well as information item lists. The task and information lists were both developed from Army doctrinal material. During the interview, participants were asked to rank their tasks by importance and identify their information needs for important tasks. The information item list was reviewed by participants for completeness and accuracy. Participants were given two contexts in which to focus their responses to our questions: current day-to-day job (peacetime/noncombat) and hostilities. Contexts and tasks were varied in an effort to identify changes in information needs. Questions were also asked of participants in an effort to identify factors they associate with the usefulness of intelligence outputs.

The third site visit was made to the 9th Infantry Division at Fort Lewis. On the basis of the previous interviews, the protocol developed for this site visit was a significant modification over those previously used. The objective of the interviews at Fort Lewis was to obtain definitions of utility attributes previously identified. The reason for setting such an objective stemmed from our realization that consistent definitions were a necessity. Prior to the site visit, tentative definitions were developed for each of the utility attributes. The bases of the tentative definitions were dictionary definitions. The definitions were supplemented with examples for each of the attributes. Four basic questions were asked about each of the attributes: (1) Did the definition proposed capture the interview participant's meaning of the attribute (and to redefine as needed)?; (2) Was the attribute a factor in assessing the usefulness of an intelligence output?; (3) Could a good and bad example of the attribute be given?; and (4) Does peacetime or wartime environment change the participant's standard or meaning of the attribute?. A number of open-ended questions was included in the protocol to be asked if time permitted.

Interview Procedure

Our approach to these interviews was to develop the protocol, administer the protocol, analyze the results, and modify the protocol for the next site visit. In this manner, the site visits allowed us to explore a variety of topics with active Army division staff officers.

All interviews were conducted by trained psychologists with extensive experience in interviewing. Participants were informed of the purpose of the research effort and the interview as well as assured of the confidentiality of their

responses. With the permission of each interview participant, interviews were tape recorded to provide verbatim transcripts for purposes of analysis. Additionally, notes were taken by the investigator to highlight major points discussed during the interviews.

Multi-Attribute Utility Assessment

MAUA is a structured approach to decision-making designed to assess how much value or utility decision-makers place on the various alternatives open to them on the basis of (a) the relative priority of the factors they consider important, and (b) how well each alternative scores on these factors. There are five basic steps in implementing MAUA:

Step 1. Define the decision problem in terms identifying the decision-makers, the decision alternatives, and those situational factors that affect the decision, but are beyond (or external to) the decision-maker's control.

Step 2. Identify the factors to be used in evaluating the alternatives. These factors are organized into a hierarchy where similar factors are grouped together. The top-level factors in the hierarchy typically represent the broad evaluation factors the decision-maker is trying to use when evaluating the alternatives. Each top-level factor is further subdivided until they are well enough defined so that attributes can be scored.

Step 3. Assign relative weights to the factors and attributes in the hierarchy to represent the relative importance (or priority) of the different decision factors.

Step 4. Evaluate an actual set of alternatives by assigning a utility score to each of the bottom-level attributes in the hierarchy for each alternative.

Step 5. Combine the relative weights and scores to obtain an overall utility score for each alternative.

MAUA is typically used to achieve two goals: to better understand the decision-maker's subjective, decision-making process; and to provide an explicit, quantitative approach to evaluating alternatives. Both MAUA goals were consistent with the project's goals of understanding how users evaluate MI outputs and of developing instruments for measuring the utility of MI outputs, respectively.

MAUA provides a rigorous and quantitative approach to understanding how different factors influence product utility. The strongest advantage of this approach involve the conceptual rigor of the MAUA model. It develops a consistent, detailed, highly-structured, and quantitative representation of the problem. This type of representation is internally consistent and mathematically powerful. It provides a powerful analytic tool for examining utility.

Another advantage of MAUA is sensitivity analysis. Specifically, the consistent quantitative structure resulting from a MAUA permits quantitative assessment of how much difference in the relative weights and/or scores are required to change the conclusion (e.g., that Alternative A is better than Alternative B).

MAUA can be effectively used in domains where there are a small sample of SMEs, or where access to SMEs is constrained such as in this effort. The generalization of obtained results can be improved with access to more SMEs, if possible within time and cost constraints.

From a pragmatic perspective, the MAUA approach to instrument development offers the advantage of a fast, cost-effective developmental cycle; e.g.,

although MAUA requires substantial time from participating SMEs, the reduced sample requirements allow for faster, less expensive instrument development than in a survey approach.

There are, however, some difficulties to the MAUA approach. The simplest approach to implementing a MAUA assumes independence between criteria and between attributes within criteria. Independence is typically defined by saying that the value of one criterion is not necessarily affected by the value of another criterion; the same holds for attributes within criteria. People tend to object to the independence assumption initially, but typically a structure can be created that maintains the independence assumption. However, if independence cannot be maintained, more complicated combination rules are required.

The initial development of the hierarchy is subjective in nature. Specifically, team researchers work with a small group of SMEs for rather lengthy working sessions in an effort to develop a hierarchy that receives consensus approval from the SMEs. Refinements of the hierarchy may be obtained by presenting the subjective hierarchy to other groups of SMEs. There has been minimal empirical research evaluating the relative accuracy of different MAUA structuring techniques. The research of Adelman, Sticha, and Donnell (1986) indicated that "top-down" and "bottom-up" MAUA structuring techniques resulted, on the average, in different looking but equally accurate MAUA hierarchies.

Alternatives to the subjective development of the hierarchy, such as statistically based approaches, are not viable. Factor analysis and its multidimensional scaling have been proposed as alternative methods for obtaining the hierarchy, but they are seldom (if ever) used outside of marketing research.

The MAUA approach to the problem of quantifying intelligence user utility was selected because of: (1) the viability of MAUA as a method for quantifying utility; (2) the MAUA results led themselves to statistical procedures for validation purposes; and 3) the cost effective nature of the approach.

The initial steps taken in applying MAUA to the measurement and evaluation of MI output utility were accomplished through a decision conference with active-duty Army personnel. The conference was conducted at Army Research Institute's field office at Fort Leavenworth, Kansas, with four senior-level personnel representing operations (G3), logistics (G4), fire support element (FSE), and intelligence (G2). The conference focused on understanding/assessing the utility of different items of information for various users under different situational contexts.

In an effort to prepare the Army participants for the conference, a package of "read-ahead" materials was sent to the participants prior to the conference. These materials can be found in Appendix B. Briefly, the package contained a "strawman" hierarchy of information items representing needs and a description of the situational factors that the project team hypothesized were important to measuring the utility (or relevance) of information items contained in the hierarchy. A MAUA hierarchy was developed reflecting information items representative of intelligence outputs. The information needs hierarchy included 54 discrete, independent items which related to typical intelligence topic groupings. The goals of the conference were to (a) obtain consensus on a hierarchy of information items as a framework for organizing information needs; (b) obtain consensus on a set of situational factors for defining situational context; and (c) obtain importance weights

testing the hypothesis that the relative value (i.e., utility or relevance) of different types of information varies by users under differing situational contexts. All three goals were achieved during the conference. The results of the conference may be found in the Results section of this report. The following discussion briefly describes the development of the materials for the read-ahead package for the conference.

Situational Context

Situational context was identified as a major source of variability in information needs and possibly intelligence output utility. Situational context could mean: who was using it, when was it being used (e.g., peacetime or wartime), where, and for what purpose. These factors are essentially not under the control of an individual user, therefore are external to an individual and part of the total situational context.

The notion of situational context appeared as a basic premise in the formulation of all Army doctrinal literature, offering additional confirmation of its important role in output utility. Doctrinal literature habitually implied that there are situational variables that may be the driving factors for accomplishing intelligence tasks. To date, the literature has stopped short of suggesting that the utility of different elements of information may also vary in differing situations.

Given that situational context could directly impact on how a user assesses information needs or assesses the utility of intelligence outputs, it was imperative to identify the relevant variables in context. Doctrinal literature provided a basis for the identification of those external factors that combine to form a situational context.

Table 2 contains the first strawman set of external factors. Each column heading from left to right represents a major situational component. The elements in each row are the descriptive variations applicable to each heading.

Level of Conflict includes possibilities intended to distinguish among a range of operational activity states, each felt to have unique attributes for potential impact on information utility.

The User category attempted to account for different specific functional uses of intelligence by arraying the major staff and command elements with unique intelligence requirements.

User Echelon, because of inherently different operational responsibilities ranging from tactical maneuver orientation to one of strategic planning, accounted for a significant situational variable.

Operational State is a refinement of levels of conflict into discrete states relative to tactical operations.

Application is a direct derivative of traditional operational staff activities. Each level represents a singularly exclusive activity felt to have a potentially unique view of utility for intelligence outputs.

The most doctrinally direct situational component, Mission, represents those prescribed responsibilities placed on a subordinate command by a senior headquarters.

A situational context was defined by selecting an element from each column. The number of potentially different situations was unmanageably large for this methodology. Not all situations were necessarily different from the perspective of intelligence output. Understanding how much influence each situational factor

TABLE 2. External Factors Matrix.

LEVEL OF CONFLICT	USER	ECHELON	OPERATIONAL STATE	APPLICATION	MISSION
Peacetime/Noncombat	G1	National	Status Quo	Data Base/ Record Keeping	Offense
Terrorism	G2	U&S Command	Pre-Hostility	Protection/ Security	Defense
Contigency Operations	G3	Theater	Hostility	Planning	Retrograde
Low-Intensity Conflict	G4	Corps	Post-Hostility	Execution	Special Operations
Mid-Intensity Conflict	G5	Division			Contingency Operations
High-Intensity Conflict	CDR	Brigade			Joint/ Combined
	FSE	Battalion			

had in discriminating intelligence output, became an agenda for the MAUA decision conference in order to minimize the number of situational factors that had to be considered.

Strawman Hierarchy

A strawman hierarchy of information items was prepared for the decision conference and contained in the read-ahead package for the participants. The actual information items contained in the hierarchy originated from an extensive information item list developed for the individual interviews conducted at Fort Stewart. This strawman was developed from numerous doctrinal materials and confirmed by active-duty personnel interviewed to be all-inclusive of information potentially needed by users. The hierarchical organization of the information items was also founded in doctrine. Specifically, the intelligence product called an Intelligence Estimate was used to guide the organization. This product was selected because of the breadth of information items contained in an estimate. The entire strawman hierarchy of information needs may be found in Appendix B. Figure 4 contains the two highest levels of the strawman hierarchy used in the Decision Conference at Fort Leavenworth.

A product orientation was used to develop the first strawman hierarchy of information needs, as discussed above. However, the orientation in our research focused on intelligence outputs rather than products. The reason for this shift in perspective was based on our research finding that there are numerous viable outputs from intelligence that do not carry the formal label of "product." The use of the term "output" means anything and everything that is produced by intelligence

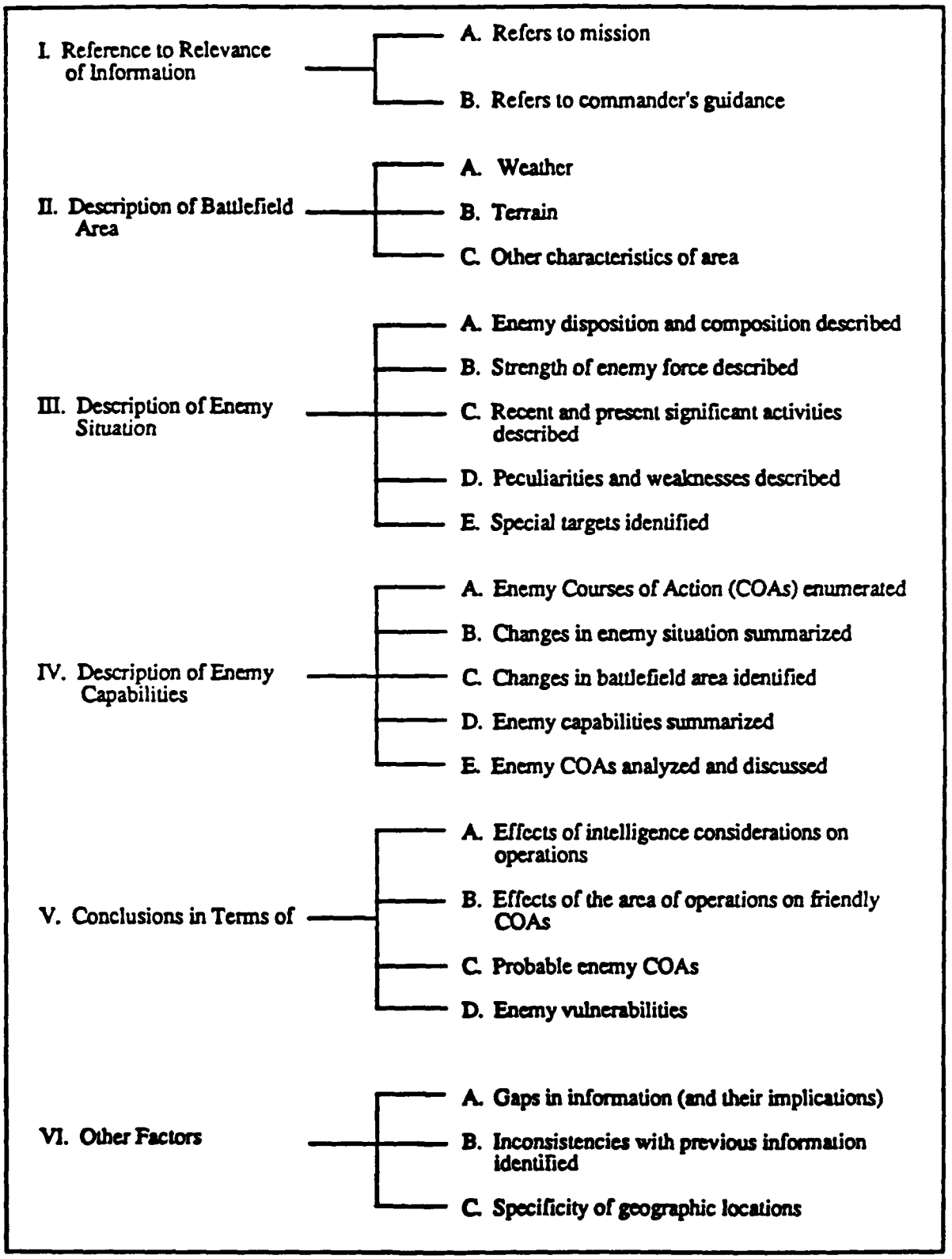

Figure 4. Strawman information needs hierarchy (levels 1 and 2 only).

for a user. The research evidence regarding outputs and products are discussed in greater detail later in this report.

Decision Conference

The read-ahead package was sent to all conference participants two weeks prior to the conference. In addition, the package contained the agenda and objectives for the conference as well as background information concerning the research effort. The time allotted for the conference was an entire day, which was required to achieve all the desired objectives.

MI Product Usage Questionnaire

A questionnaire approach was developed early in the research to survey users about intelligence product usage, similarities and differences in users, and potential problems to investigate. The term "intelligence product" is supposed to distinguish the finished result of the intelligence process (e.g., analysis, confirmation from other sources) from the raw data, information, (and noise) vacuumed into the input side of the intelligence system. Intelligence focuses on supporting the command staff with information, frequently in the form of written and verbal products. The development of products requires tasking and management of significant resources by intelligence producers, presumably in proportion to the importance of the product. Users in turn must provide resources to read the product, attend a briefing, or extract information from a product. Doctrine identifies a large number of products and defines the content, format, and a standard reporting cycle. While doctrine defines numerous parameters of products, we questioned whether doctrine covered all the outputs received by

intelligence users. If, in fact, doctrine defined "all there was," then doctrine could be used as a yardstick for the evaluation of intelligence. In other words, the metric for evaluation could be doctrinally based.

Our questionnaire sought to determine whether a strict intelligence doctrinal definition of products was sufficient for our research effort. The development of the questionnaire was guided by two constraints: (1) time to complete the questionnaire should be no more than 30 minutes; and (2) the questionnaire should be sufficiently self-explanatory so that a project researcher was not required to administer the survey.

Selection of Products for Questionnaire

The first step in the questionnaire development was to identify products to be included in the questionnaire. We began by identifying intelligence products recognized by intelligence doctrine, Field Manual 34-3, 1986, and Field Manual 34-1, 1984, were the prime sources of the study in the phase. Intelligence doctrine identifies numerous written products and various types of formal briefings as the output of intelligence. In addition, doctrine identifies the various formats that some products may take under specific situations (e.g., Intelligence Annex if issued separate from an Operations Order, Estimate for Stability Operations, Intelligence Summary for Joint Operations). The count of products becomes quite long when consideration is given to the permutations of products created by format and specific tactical operations.

In an effort to comply with the directed constraints, we elected not to include every product or intelligence output in our questionnaire. To limit the set of

products, we eliminated any products not produced by division intelligence. In the case of four different imagery reports, these were included as a group. In addition, we eliminated some products that survey participants might rarely receive, particularly in the peacetime environment, such as nuclear biological and chemical products (i.e., NBC-1, NBC-2, etc.). However, we did allocate space on the questionnaire for users to add products that they felt should be included in the analysis. The final version of the survey contained ten doctrinal products. Two types of briefings were included in the final questionnaire version, formal and informal. Much of the information exchange between intelligence and users takes place in an informal manner. The six non-doctrinal products selected for inclusion in the questionnaire were not specified by doctrine as products. Rather, these "products" are related to the Intelligence Preparation of the Battlefield (IPB) process. They were identified by in-house SMEs for inclusion in this questionnaire. One point of interest to this study was whether or not operations users would have familiarity with these "products" and further whether or not they would view them as products. The products included in the questionnaire may be found in Table 3.

Questionnaire Construction

Given the objective of this survey, there were numerous topics that the survey could potentially cover. A totally open-ended set of questions was not seriously considered as a vehicle for a number of reasons; for one, such questionnaires take too much time to fill out and may be prone to interpretation

TABLE 3. Military Intelligence Product Usage Questionnaire: Products Surveyed.

Doctrinal Products:

- Intelligence Summary (INTSUM)
- Periodic Intelligence Report (PERINTREP)
- Supplementary Intelligence Report (SUPINTREP)
- Intelligence Annex
- Intelligence Estimate
- Intelligence Report (INTREP)
- Situation Report (SITREP)
- Imagery Reports
- Spot Report
- Responses to Information Requests

Briefings:

- Formal Briefings
- Informal Briefings

Non-Doctrinal Products:

- Collection Priorities
- Named Areas of Interest (NAIs)
- Target Areas of Interest (TAIs)
- Target List
- Target Nomination
- Target Priority List

problems. Our approach was to identify a small number of topics to address that could be presented in a highly structured manner to ease respondent completion and interpretation.

The product usage questionnaire contained three sections. The first section asked subjects to supply demographic data about themselves. The second section asked subjects to rate all products on specific topics. The third section contained open-ended questions. Appendix C contains the final version of the survey questionnaire.

Demographic Data. Collection of demographic data was necessary to determine if the survey participants were in fact the appropriate target group for this survey. The intent of the survey was to assess the usefulness of intelligence products from the perspective of operational users. Additional demographic information collected included rank, primary and alternate specialties, and a brief identification of their division level operational staff experience. Individuals participating in this survey included active Army personnel interviewed at the various site visited and decision conference attendees as well as other active Army personnel discussed in the Results section of this report.

Questionnaire Topics. The structured questionnaire addressed four topics: familiarity, frequency of use, usefulness, reason for use. Each topic contained a brief instruction paragraph and a list of products by the scale or rating categories to be completed. Each form allowed for the addition of products at the bottom of the form. Consistent five point or category assessment was used in an attempt to ease the completion of the questionnaire. Products were listed in the same order for each

rating form; doctrinal products were listed first, followed by briefings, and non-doctrinal products.

First, all subjects were asked to rate their familiarity with each intelligence product contained in the survey. Since we wanted to obtain the opinion of users about products based on their experience with the products, this created a need to assess a respondent's experience with each product. A five-point scale was utilized with the following meanings: 1 - Not at All Familiar, 2 - Slightly Familiar, 3 - Moderately Familiar, 4 - Very Familiar, and 5 - Extremely Familiar. Subjects were asked to select only one category to describe how well acquainted they were with a particular product. The importance of the familiarity rating was to tell us whether or not subsequent ratings were based on the first-hand experience of the subject. If a subject rated his familiarity with a particular product as "not at all familiar," then answers to subsequent questions about that product would not have actual experience as a basis.

The second topic addressed in the questionnaire concerned the frequency of use of products. The questionnaire contained five categories: Don't Use, File for Later Use, Use Once, Use Repeatedly, and Use Right Away. Forced choice among these categories did not appear appropriate from discussions with in-house SMEs. Thus, subjects were instructed to select as many as necessary to describe their frequency of use of a product.

The third topic addressed in the questionnaire dealt with product usefulness. A five-point scale was developed on which usefulness was to be rated: 1 - Not Useful, 2 - Slightly Useful, 3 - Moderately Useful, 4 - Very Useful; and 5 - Extremely Useful. Subjects were instructed to consider how well a product fit

their requirements or the sufficiency of the product to meet their intelligence needs. Subjects were required to make a single usefulness category selection for each subject.

A fourth topic was added to the questionnaire after the initial data collection from five subjects. This topic dealt with the reason for use of each intelligence product. Subjects were asked to characterize the reason(s) why they use a particular product via the following: Only Source Available, Best Source Available, Easy to Use, Most Timely Information, and other reasons that they were asked to specify.

Open-Ended Questions. The final portion of the survey instrument contained a number of open-ended questions. Subjects were given the option of answering any or all of these questions at their discretion. The open-ended questions were included in the survey to elicit user opinions not captured by the structured portion of the survey. Subjects were given the opportunity to recommend modifications to specific intelligence products in the first open-ended question, identify experience at specific commands or unit assignments that formed the basis of their assessment of products in the earlier portion of the questionnaire, and identify assumptions that they made about the intelligence products they rated. Also, subjects were asked what questions should have been asked in the survey that were not. The concluding question asked subjects what they would like to point out to researchers looking at the operational perspective of intelligence products.

Questionnaire Evaluation

SMEs were consulted to determine the appropriate ordering of products. Pilot testing of the questionnaire was accomplished with in-house volunteers not familiar with the research effort to determine the time for completion, adequacy of instructions, and general comments on the survey instrument. All members of the research team including government representatives offered guidance and suggestions concerning the survey instrument.

RESULTS

Summary

The first year of this research led us to the major conclusion that the effectiveness of MI is directly related to how useful its output is to users. While the effectiveness of MI may be looked at from an internal perspective, such as the effective use of resources, resource usage is too narrow a focus for judging effectiveness. By themselves, internal resources, even if effectively used, do not indicate whether the intelligence output was useful to the user or how the use of resources may be contributing to the mission. A broader view of MI effectiveness considers the added value of inference contributed by the human component and the added value of processing that makes the output more useful to users. Equating MI effectiveness to user utility allows us to proceed with the development of a measurement instrument that focuses on quantitative assessment of utility factors.

The results of the MI product usage questionnaire (MI PUQ) led us to conclude that using a product orientation as defined by intelligence doctrine to develop a measurement instrument is inadequate. Users of intelligence recognize and assign high utility to many intelligence outputs that are not recognized as products by intelligence doctrine. The more general term "outputs" was adopted by this effort rather than "product" to connote any output from intelligence to a user.

The results of the MAUA conference challenge some aspects of intelligence doctrine. The strawman information needs hierarchy presented at the conference was organized around the doctrinal intelligence product called an estimate, selected because of the breadth of information contained in the estimate. Participants in the

conference reorganized the information needs to appear more like the outputs of the IPB, a doctrinal intelligence process but not a doctrinal product.

The results of the activities undertaken during the first year of the research effort are organized by technique in the order of interviews, MAUA session, and questionnaire.

Results of Individual Interviews

The individual interviews were conducted in an effort to address multiple objectives identifying: (1) operations user information needs, (2) the range of factors that operations users consider in the assessment of the utility of an intelligence output, and (3) any factors external to an operations user that influence either his or her information needs or utility factors.

Individual interviews were conducted with two populations of military personnel. One population was drawn from the range of in-house operations expertise made available to the research team, in which two separate phases of in-house interviews were conducted, comprised of eight individuals participants. The second population consisted of individuals currently serving as division staff officers, which consisted of fourteen active Army division staff officers at three different site locations. The following discussion of the results of the interviews is organized by topics addressed by the interviews.

Information Needs

The identification of the information needs of operations users was a major focus of the open-ended interviews. For most of the interviews, the identification

of information needs was conducted in open-ended interviews. In this manner participants were placed in a position of recalling their needs from memory. While this approach yielded many user information needs, it was also quite time consuming. For that reason, we modified the procedure for one of the later site visits and prepared a lengthy list of information items to permit, though not require, interview participants to identify their needs from the list. Additionally, participants were asked to modify the list if necessary in an attempt to compile a comprehensive list of possible information needs.

The strawman information item list was developed from doctrinal material as well as Army studies relating to information requirements generally associated with the division echelon. This list included information items elicited from the open-ended interviews as well. Active Army division staff officers who reviewed the list found it to be complete and offered no suggestions for further modifications. The information item list may be found in Figure 5.

Influences on Information Needs

An initial hypothesis in this research was that information needs are likely to vary with the task an individual is performing. This hypothesis proved to be untrue based on numerous individual interviews. One G3, for example, maintained that his information needs were influenced by a context that did not include his task at hand be the task "coordinating all aspects of maneuver" or "developing the command SOP." In a sense, it would appear that information needs of a user represent the elements of the user's mental model of the battlefield. Further, it is

Enemy Capabilities (Who, What)
- unit identification
- unidentified units and available information
- unit descriptions and disposition
- force composition and organization
- unit missions
- other OB (personalities, history, tactics, training, etc.)
- time/distance factors
- capability to hit high value friendly locations
- ability to influence friendly scheme of maneuver
- relative combat power
- strengths/weaknesses in logistical/technical capabilities

Enemy Disposition (Where)
- forward trace
- unit locations
- main area of attack
- echelonment
- support elements
- reserves
- staging areas
- supply lines
- supply areas
- air corridors

Enemy Strengths and Weaknesses (in What Strength)
- unit status
- resupply rates
- critical nodes
- main force
- non-effective units
- morale

Enemy Intentions
- concentrations of forces
- preparations
- readiness levels
- courses of action
- most probable course of action (units and strengths in main attack)
- enemy intelligence collection priorities

Enemy Activity (When)
- phase lines on enemy avenues of approach
- activities in rear area
- activities in front area
- activities in deep area
- relevant activity outside area of influence
- activities organized functionally (air, nuc, chem, naval, logistic, REC, etc.)
- movements (combat maneuver, artillery, airborne, logistics)

Battlefield Area
- about movement corridors
- about specific areas of interest
- target areas
- boundaries
- general terrain analysis
- general weather analysis

Targets
- target folders (doctrinal templates, imagery, weaponeering, etc.)
- high value target lists
- target nominations
- potential nuclear targets
- enemy concentrations
- bomb damage assessement
- EW targets
- special targets
- prohibited targets/areas

OPSEC/Friendly Vulnerabilities
- enemy intelligence capabilities
- friendly vulnerabilities
- espionage, sabotage, Spetnatz, airborne, etc.
- REC activities

Information Requirements
- list of requirements by priorities/requestor
- intelligence assets tasked to requirements
- status of fulfilling requirements with collection plan
- information gaps and explanation
- sufficiency of intelligence assets to meet requirements

Intelligence Summaries
- historical record of significant events
- comparison of prediction to actual events
- projections of significant enemy actions

Intelligence Credibility for Projections
- technical capabilities/limitations of data sources
- continuity of tracking critical enemy force elements
- completeness of situation display
- how much of enemy mass is represented by units being tracked
- intelligence asset status

Changes
- OB changes (character of enemy)
- movements
- unusual activities, unanticipated events
- serendipitous events
- changes in strengths/weaknesses
- disposition of units
- replacement, rotation, reinforcement, or resupply of units
- enemy intelligence activities
- advance to new phase line
- enemy COA change
- indicators of decision points
- situation changes (weather, terrain, friendly)

Figure 5. Information item list.

the model and its associated gaps that drive information needs rather than tasks driving information needs.

During in-house individual interviews, participants were asked to rate the importance of individual information items in relation to two different contexts, peacetime and wartime. The histogram contained in Figure 6 shows the mean importance rating of the information items in the peacetime and wartime context. For most items, the importance rating was higher in the active hostilities than in peacetime (the one exception was political climate). The means and standard deviations of the importance ratings may be found in Appendix D.

Intelligence Output Utility Factors

The individual interviews sought to identify the range of factors that influence operations users' assessment of the utility of an intelligence output. The in-house interviews sought to query interview participants in depth about the factors and their importance in particular contexts. Site interviews, on the other hand, restricted queries to the identification of the factors.

Individual interviews identified a total of twenty-one possible factors that influence the utility assessment of an intelligence output. These factors are shown in Table 4. The order reflects the frequency of responses of the factors. Timeliness and accuracy were the most frequently given responses to a question about factors that influence the utility of intelligence outputs.

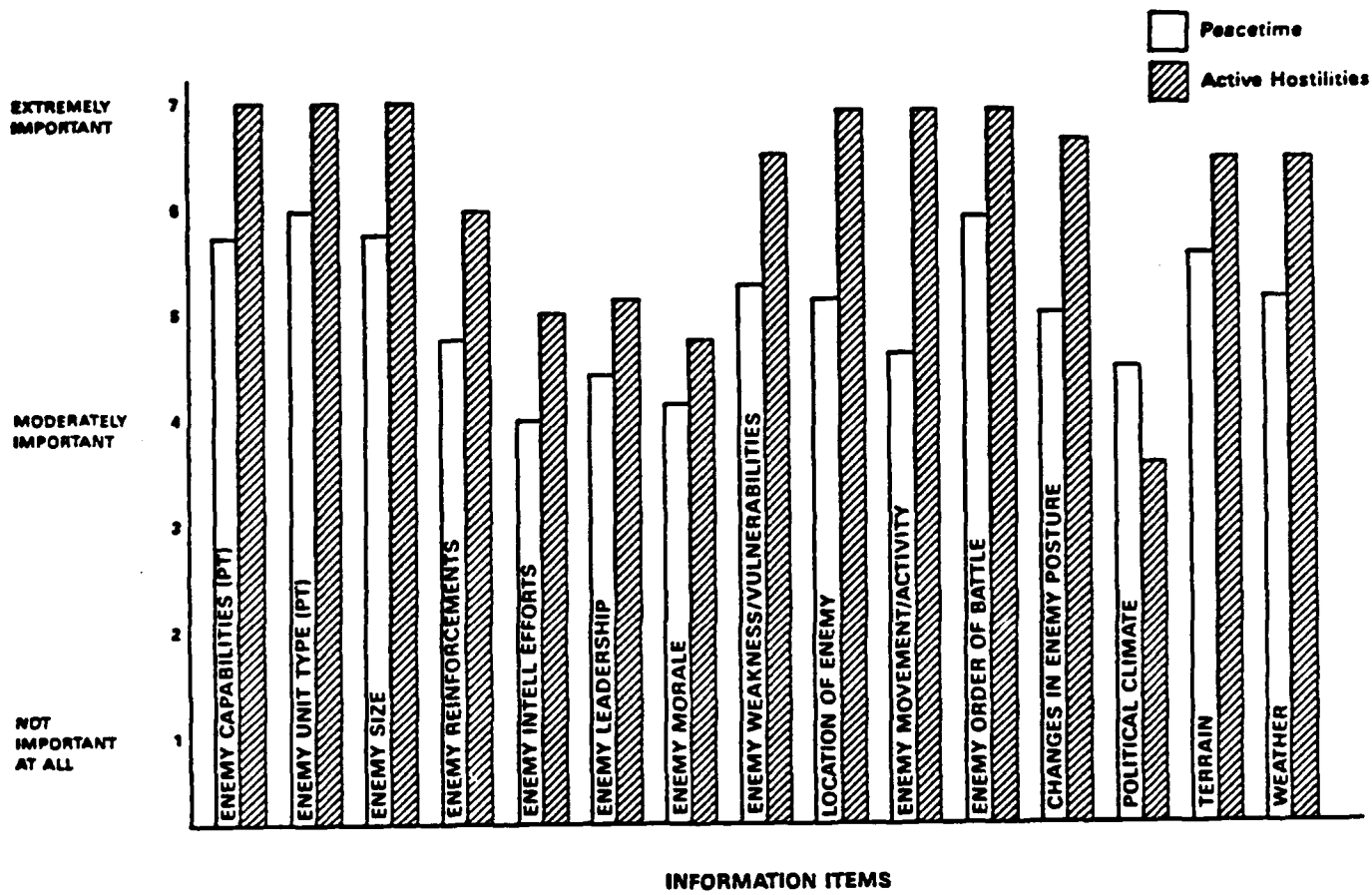

Figure 6. Importance rating of information items

TABLE 4. Intelligence Output Utility Factors.

Timeliness
Accuracy
Currency
Relevant to division mission
Reliability (of source, analyst, or information)
Credibility (of source or analyst)
Detail
Summary
Filtered
Processed
Complete
Interpreted
Concise
Clear
Simple
Information
Intelligence
Use of graphics
Source confirmed
Source identification
Confidence of producer in output

The factors contained in Table 4 are the actual terms used by the interview respondents, elicited by open-ended questions. Examination of the list of factors revealed apparent redundancy. For example, the terms "unambiguous" and "clear" are synonymous. In an effort to identify redundancy, definitions were developed for each factor. Standard dictionary definitions were used as the basis. In addition, transcripts of the interviews were reviewed to identify instances where the use of a term appeared to differ with the interview respondents' intended meaning. The utility factor "accuracy" is a particular case in point. Accuracy, in general usage, refers to correctness, or quality of representing reality. Some users appear to use the term accuracy to mean precision (e.g., eight-digit grid coordinates are more precise than six digits though the accuracy may be equal). The utility factors "timeliness" and "currency" both appeared to relate to the user's need to receive information "in time" to make use of it. Timeliness, on the one hand, appeared to relate to the overall output while currency appeared to reflect the age of information content. Perishability was selected as a replacement term for currency in an attempt to further distinguish the concepts. Perishability pertains to the fleeting nature of a particular information item. For example, location data for an airfield is not as perishable as the location of a moving column of tanks.

In preparation for the final site visit, the list of utility factors was modified by eliminating redundant factors. The list was expanded to include factors that were apparently intended but not explicated during previous interviews and redundant factors were eliminated. Further, definitions were developed for all factors. The final site visit focused on review of the factors and their definitions.

The results of the site visit indicated that all utility factors were viewed as legitimate. The definitions of the factors as modified by the site visit appear in Appendix E.

The list of utility factors that operations users associate with intelligence outputs is rather long. One of the more interesting features of the list is that it provides a broad view of attributes that relate to utility. While numerous factors relate to the content of an output, other factors, such as clear and concise, relate to the way content is presented in an output rather than the content itself. This suggests that the user's perspective of utility includes not only the actual content of the output but the manner in which the content is presented.

Some utility factors identified by users appear to pertain to the intelligence process itself. The utility factor "filtered," for example, relates to the utility users place on intelligence being screened for them, rather than having all information passed to them. A recurrent problem noted by some interview participants was information overload, possibly the result of insufficient filtering on the part of the intelligence process. The utility factor "processed" relates to interpreting or aggregating information from input level to an output form. Again, this factor appears to relate to the intelligence process itself rather than the content or style of an output.

In summary, the interviews conducted with intelligence users identified numerous factors associated with the utility of intelligence outputs. Some of the factors identified relate to attributes of the content of an intelligence output. Other factors relate to the manner in which the output is presented. Still other factors in user utility pertain to the intelligence process itself and imply a quality control function in the process that functions to increase value of outputs to users.

Influences on Output Utility Factors

Twelve output utility factors were identified by the in-house interview participants. These utility factors were rated on an importance scale for the two different contexts, peacetime and active hostilities. With the exception of the factor completeness, all factors were rated higher in the active hostilities context than in the peacetime context. Figure 7 contains a histogram comparing the frequency of importance ratings for active hostilities and peacetime. The means and standard deviations of the importance ratings may be found in Appendix D. A sign test was conducted on the importance ratings of outputs and was found to be significant ($z = 3.67$, $p<.0001$).

Accuracy was the highest rated utility factor in the peacetime context. In the context of active hostilities; however, timeliness and currency received higher importance ratings. Not surprisingly, the implication being that a higher premium is placed on receiving timely information during hostilities. The interviews confirmed comments that when there is a trade-off between waiting for more accurate information versus receiving less accurate information sooner, users will typically reduce their accuracy standards in favor of timeliness in an active hostilities environment.

The utility factor "filtered," which was discussed above, relates to multiple outputs. This factor was not identified as a utility factor at all sites, nor was the factor identified by all staff elements. Unit operational environment and unit mission may be a possible influence on this factor. For example, the information overload problem, and hence the high utility placed on filtered output, was

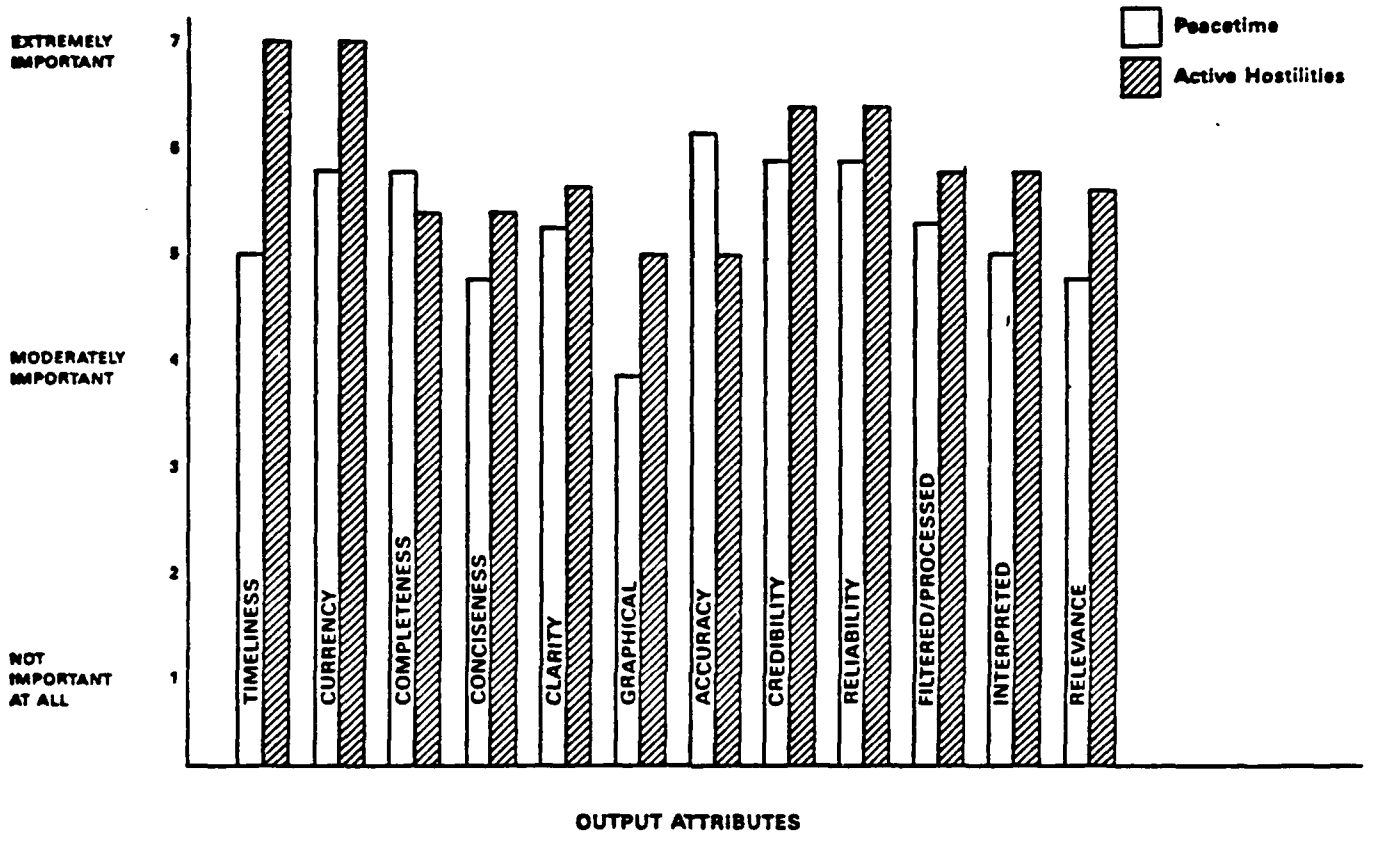

Figure 7. Importance rating of output attributes

identified by Fort Stewart and Fort Lewis operations personnel but not by Fort Bragg personnel. By contrast, Fort Bragg identified information underload as a key problem area. These sites are contrasted not only by the perceived difference in problems but the distinct differences in mission orientation.

Results of MAUA Session

A one-day conference was held at the ARI Fort Leavenworth field office with four senior-level, active-duty Army personnel representing operations (G3), logistics (G4), fire support control (FSC), and intelligence (G2). The goals of the conference were to obtain (a) consensus on a hierarchy of information items so that it represented a framework for organizing information needs; (b) consensus on a set of situational factors for defining situational context; and (c) importance weights testing the hypothesis that the relative value of different types of information depends on different users under varying situational contexts.

To prepare for the conference, the Army participants were sent a package of materials (see Appendix B) that included an overview of the purpose of the conference, a strawman hierarchy of information needs, and a description of the situational factors that the project team hypothesized were important to measuring the utility (or relevance) of information contained in MI outputs. The morning session of the conference was spent modifying the strawman hierarchy of information needs so that it represented a framework that all Army participants could agree on. In addition, the participants independently generated "generic importance weights" indicating, in general, the relative value of the information to

them as specific types of users of MI output. Unfortunately, the logistician could only participate in the morning session.

The afternoon session of the conference was spent modifying the description of the situational factors, in particular the External Factors Matrix, so that it represented those factors that the participants agreed would affect the utility of different information needs. The three participants independently generated a second set of importance weights, but this time for a situation (defined in terms of one level from each of the external factors) that they thought was substantially different from the situation they had in mind when generating the "generic weights." The conference concluded with the participants completing the MI Product Usage Questionnaire, and with a general discussion of what other factors affect the utility of MI outputs.

Although different members of the project team led different sessions of the conference, the format throughout the conference was that of a working session. This section of the report focuses only on the obtained hierarchy of information needs, the external factors matrix, and the two sets of importance weights.

Information Needs Hierarchy

The agreed upon hierarchy of information needs is presented in Figure 8. The hierarchy has five top-level nodes: I, Reference to Relevance of Information; II, Description of Battlefield Area; III, Description of Enemy Situation; IV, Description of Enemy COAs; and V, Intelligence Considerations. Each node is subdivided and then in most cases are further subdivided in order to identify more distinct information needs.

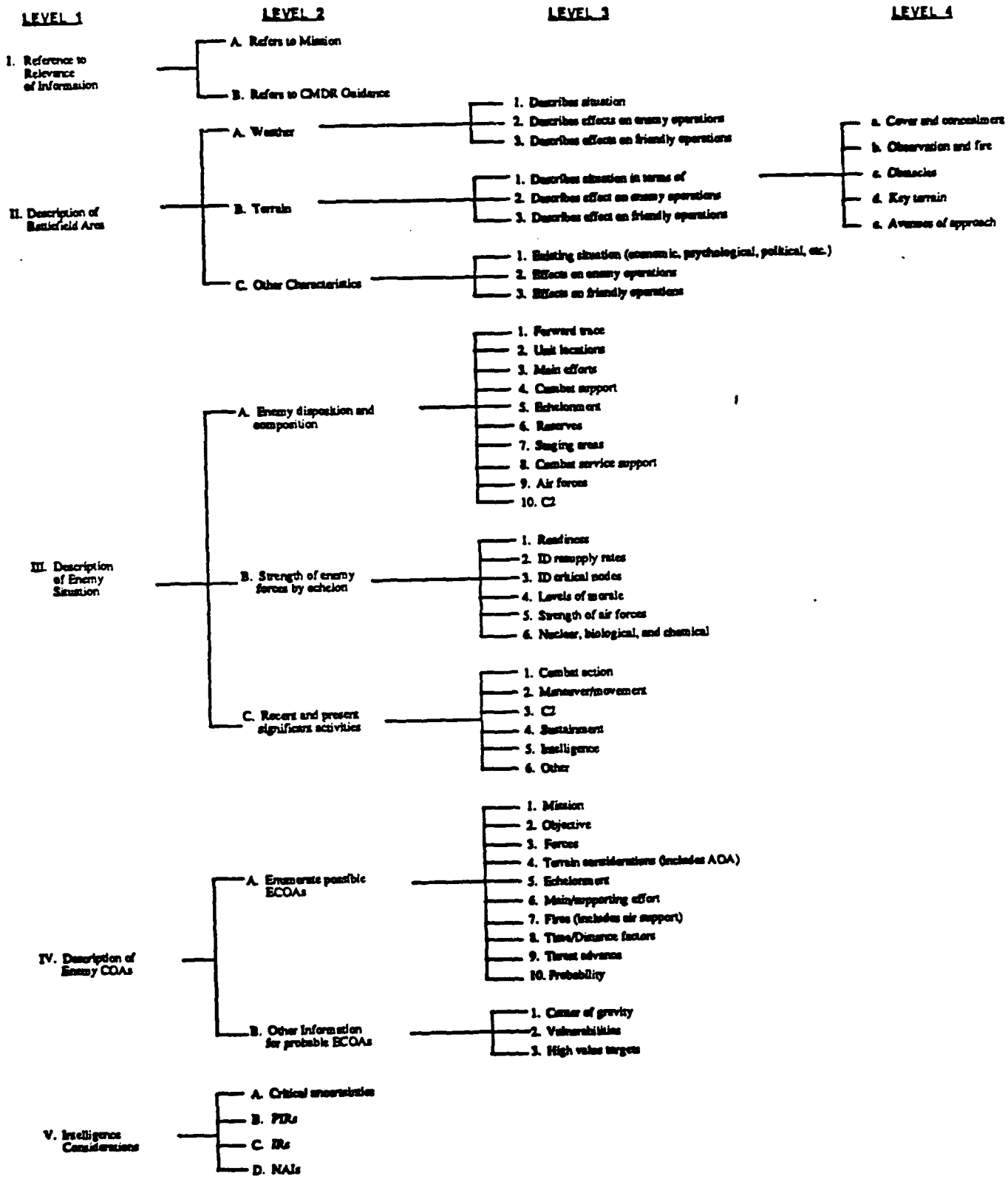

Figure 8. Information needs hierarchy.

Comparison with the strawman hierarchy in Appendix B indicates that the participants significantly modified the hierarchy in two ways. First, they made the strawman hierarchy, which was primarily built using the categories found in the intelligence estimate, less doctrinal and more cognitive in the sense that the relationship between information nodes represented better what they saw to be the information needs. Second, where appropriate, they modified the structure itself to correspond better with the principal steps in the IPB process. In particular, they modified the elements comprising "Description of Enemy Situation" and combined two nodes in the strawman hierarchy to form the "Description of the Enemy Courses of Action" for the hierarchy to better correspond with the Threat Description and Threat Integration steps, respectively, in the IPB process.

After reaching consensus on the hierarchy of information needs, the participants independently generated "generic" importance weights indicating in general the relative importance they placed on the items of information. Weighting proceeded in a "bottom-up" manner, beginning with the weighting of the lowest levels of the hierarchy first. The weights were obtained by asking the participants to divide up 100 points among the information items at each node of the hierarchy. For example, they divided 100 points among the three information items comprising Weather, among the three nodes (including Weather) comprising the Description of the Battlefield Area node, and among the five nodes which, in total, comprised Information Utility as represented in the entire hierarchy. Empirical research by Adelman, Sticha, and Donnell (1986) has shown that this simple technique of dividing up 100 points is a reasonably good technique for obtaining

relative importance weights, and certainly adequate for the purpose of the conference.

The "generic" relative importance weights for each of the four participants are shown in Table 5. Before examining the weights the reader should keep the following points (or caveats) in mind. First, the weights represent the opinion of four individuals and should not be generalized to be necessarily representative of the four different user groups. Second, the relative weights were not discussed during the conference and, consequently, the participants did not have the benefit of discussion and subsequent clarification that might have prompted them to modify their position. Third, because of time limitations, the group facilitator did not have the opportunity to implement procedures for helping the participants scrutinize their position.

All the caveats notwithstanding, examination of Table 5 indicates that, as hypothesized, users did significantly differ in the generic relative weights they gave to the hierarchy, thereby reflecting their different relative information needs. Figure 9 offers a graphic representation of the relative weights assigned to the five high-level nodes of the hierarchy for the generic context. Examination of the relative weights for the G3 and the G4 illustrate this point. The G3 considered "Description of Enemy Courses of Action" to be the most important and gave it a relative weight of 50. The G4 also considered "Description of Enemy Courses of Action" to be important (rel. wt. = 25), but considered the most important to be "Description of Battlefield Area (rel. wt. = 45). Examination of the relative weights given to the two categories comprising the "Description of Enemy COAs" also demonstrates the differing relative information needs of the G3 and the G4. In

TABLE 5. Relative Importance Weights: Wartime.

INFORMATION ITEM	G3	G2	G4	FSC
I. REFERENCE TO RELEVANCE	10	25	20	20
A. Refers to Mission	50	30	50	50
B. Refers to CMDR Guidance	50	70	50	50
II. DESCRIPTION OF BATTLEFIELD AREA	10	15	45	10
A. Weather	40	30	40	40
1. Describes Situation	33	40	20	30
2. Describes effects on Enemy Operations	33	20	30	20
3. Describes effects on Friendly Operations	33	40	50	50
B. Terrain	40	50	50	40
1. Describes Situation	33	20	20	33
2. Describes effects on Enemy Operations	33	40	10	33
3. Describes effects on Friendly Operations	33	40	70	33
C. Other Characteristics	20	20	10	20
1. Existing Situation	33	60	33	20
2. Describes effects on Enemy Operations	33	10	33	40
3. Describes effects on Friendly Operations	33	30	33	40
III. DESCRIPTION OF ENEMY SITUATION	20	15	10	20
A. Enemy Disposition and Composition	40	50	30	40
1. Forward Trace	10	15	20	10
2. Unit Locations	10	20	0	15
3. Main Efforts	15	20	20	15
4. Combat Support	8	5	20	5
5. Echelonment	8	10	0	5
6. Reserves	12	10	0	10
7. Staging Areas	8	5	0	15
8. Combat Service Support	12	5	10	5
9. Air Forces	7	5	30	5
10. C2	10	5	0	15
B. Strength of Enemy Forces by Echelon	40	30	20	20
1. Readiness	40	55	10	25
2. Identified Resupply Rates	5	5	10	6
3. Identified Critical Nodes	15	5	0	25
4. Levels of Morale	10	5	10	6
5. Strength of Air Forces	15	5	40	13
6. Nuclear, Biological, and Chemical	15	20	30	25
C. Recent and Present Significant Activities	20	20	50	40
1. Combat Action	20	25	70	20
2. Manuever/Movement	20	25	0	30
3. C2	20	10	0	20
4. Sustainment	10	10	10	15
5. Intelligence	20	20	20	10
6. Other	10	10	0	5

TABLE 5. Relative Importance Weights: Wartime Continued.

INFORMATION ITEM	G3	G2	G4	FSC
IV. DESCRIPTION OF ECOAs	50	25	25	30
A. Enumerates Possible ECOAs	10	70	100	60
1. Mission	4	15	20	10
2. Objective	4	10	20	10
3. Forces	9	15	5	10
4. Terrain Considerations	2	5	0	0
5. Echelonment	9	5	0	10
6. Main/Supporting Effort	18	10	10	10
7. Fires (includes Air Support)	3	10	20	30
8. Time/Distance Factors	14	5	5	10
9. Threat Advance	14	10	0	0
10. Probability	23	15	20	10
B. Other Information for Probable ECOAs	90	30	0	40
1. Center of Gravity	60	10	0	25
2. Vulnerabilities	30	60	0	25
3. High Value Targets	10	30	0	50
V. INTELLIGENCE CONSIDERATIONS	10	20	0	20
A. Critical Uncertainties	70	31	100	30
B. PIRs	20	31	0	30
C. Information Requirements	0	19	0	10
D. NAIs	10	19	0	30

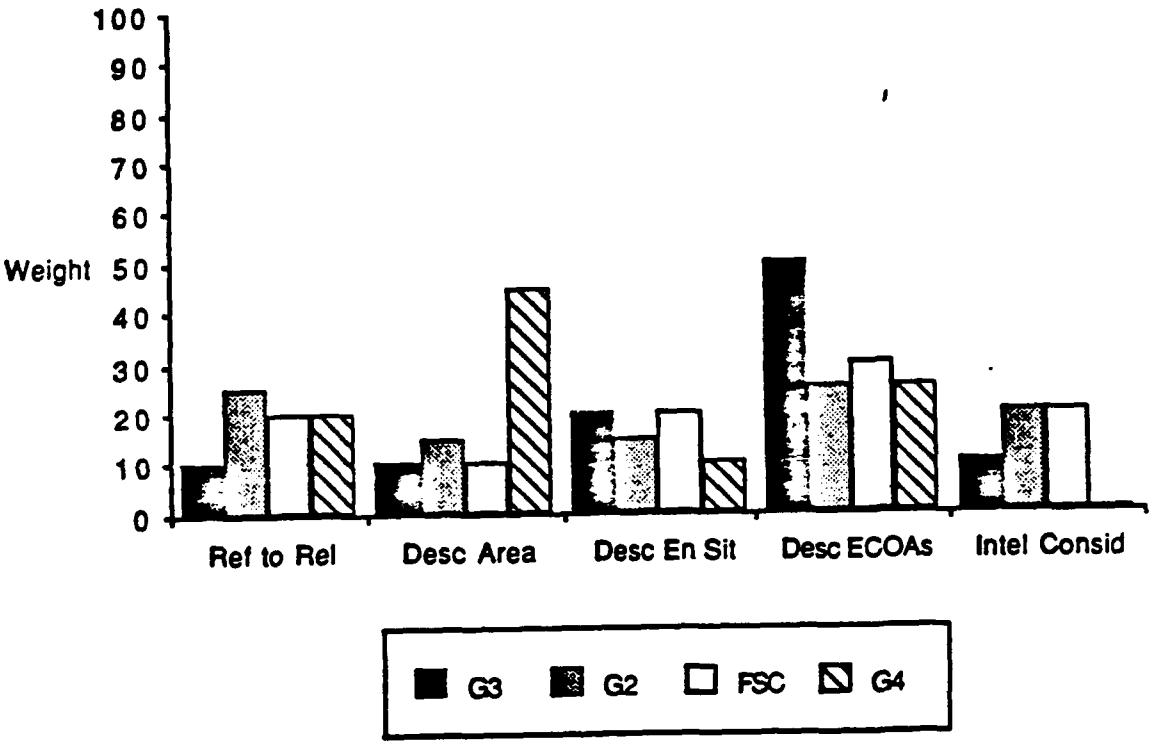

Figure 9. Comparison of user's relative importance weights in wartime.

particular, the G3 gave "Enumerates Possible COAs" a relative weight of 10 and "Other Information for Probable Enemy Courses of Action" a relative weight of 90. In contrast, the G4 gave all 100 points to "Enumerates Possible Courses of Action." Examination of the ten items comprising "Enumerates Possible Course of Action" again shows that the G3 and G4 had a different distribution of relative weights, again reflecting differing relative information needs.

When examining Table 5 the reader should keep two additional points in mind. First, the G3 and the G4 did not always have differing relative information needs. And, second, while the G3 and the G4 appear to have the greatest difference in their relative information needs, the G2 and FSC also had differences in their relative information needs, both between themselves and with the G3 and G4. Examination of the relative weights the participants gave the three items comprising the "Other Characteristics" attribute category under the "Description of Battlefield Area" node illustrates both points. Specifically, the G3 and the G4 gave all three attributes equal weight. In contrast, the G2 gave the higher relative weight and the FSC the lowest relative weight to "existing situation."

External Factors

The second goal of the conference was to obtain consensus on a set of external factors for defining situational context. During the course of the conference the external factors matrix was streamlined. Participants in the conference pointed out that the distinctions between elements in all the categories were so subtle that utility weighting lost its impact. For example, in Levels of Conflict, from Terrorism to High Intensity, the nuances were impossible to account

for discretely. However, in a case where there are only three variations on the situational theme, such as Peace, Resources Short of War, and War, there was a suitably powerful distinction. (Resources Short of War is a new term being applied to several levels of conflict from terrorism through low intensity conflict.) Similar modifications were made under each situational component. Equally as important, conference participants pointed out that the order in which the column headings were arrayed should be modified. Their recommendation was that from left to right, the first elements must be echelon and level of conflict because all other external factors relate in logical sequence from those initial two.

Other recommended changes included: (1) use of the SIGMA STAR functions rather than identifying user staff positions, (2) aggregation of echelons into three relevant elements that share common attributes, (3) reduction of the mission possibilities to three primary elements, and (4) inclusion of Training in the Operational Applications field. The result of the modifications is a more usable matrix, shown in Table 6, from which situational variables may be selected. The selected variables yield a contextual profile that does permit a weighted evaluation of information utility in a situational context.

If one assumes that the project team will focus only on the echelon level of "division and below," and that relative weights have to be obtained for each of the five user groups, then there are 36 (3x3x4) situations, defined in terms of the other possible combinations of the levels on the other possible combinations of the levels on the other external factors, that might significantly affect the relative importance of users' information needs. Discussion with conference participants suggests, however, that it might be possible to group the 36 situations into perhaps no more

TABLE 6. Revised External Factors Matrix.

ECHELON	LEVEL OF CONFLICT	USER	MISSION	APPLICATION
National	Peacetime/Noncombat	Maneuver	Garrison	Data Base/ Record Keeping
Corps/ Theater	Resources Short of War	Fires	Deployment	Planning
Division and below	War	Combat Service Support	Combat Operations	Execution
		Air Defense		Training
		Intelligence		

than five clusters such that each user's relative weights for the information needs would be the same for situations within a cluster, but different for each cluster. The possibility of clustering situations needs to be pursued because it would minimize the extent to which the utility of MI outputs must be treated as situationally dependent and, in turn, would simplify the development and application of a utility metric for MI outputs.

Situational Information Needs

After obtaining consensus on the External Factors Matrix, the participants were asked if they were thinking of a situation defined in terms of one level of each of the four external factors except "user" when they generated their generic relative weights for the information items. All participants indicated that they were basically thinking of the following situation: division and below, war, combat operations, and execution. The participants were then asked if they could define a situation for which they would have different weights for the information items. They suggested the situation of "division and below, peace/noncombat, garrison, and data base/record keeping." The relative weights for both situations, respectively, for the G2, G3, and FSC are presented in Table 7.

Examination of the relative weights that each participant gave for both situations clearly supports the hypothesis that the relative importance of the information needs is situationally dependent. For example, "Description of the Battlefield Area" and "Description of the Enemy Situation" were the two most important information needs for the G2 for the second situation and the two least important needs for the first situation. The "Reference to Relevance" was the most

TABLE 7. Comparison of Relative Importance Weights.

	Peacetime			Wartime		
INFORMATION ITEM	G3	G2	FSC	G3	G2	FSC
I. REFERENCE TO RELEVANCE	50	10	30	10	25	20
A. Refers to Mission	70	60	40	50	30	50
B. Refers to CMDR Guidance	30	40	60	50	70	50
II. DESCRIPTION OF BATTLEFIELD AREA	10	30	10	10	15	10
A. Weather	30	15	30	40	30	40
1. Describes Situation	40	60	25	33	40	30
2. Describes effects on Enemy Operations	20	20	15	33	20	20
3. Describes effects on Friendly Operations	40	20	60	33	40	50
B. Terrain	30	70	50	40	50	40
1. Describes Situation	40	20	20	33	20	33
2. Describes effects on Enemy Operations	20	40	20	33	40	33
3. Describes effects on Friendly Operations	40	40	60	33	40	33
C. Other Characteristics	40	15	20	20	20	20
1. Existing Situation	50	20	60	33	60	20
2. Describes effects on Enemy Operations	10	40	10	33	10	40
3. Describes effects on Friendly Operations	40	40	30	33	30	40
III. DESCRIPTION OF ENEMY SITUATION	10	30	10	20	15	20
A. Enemy Disposition and Composition	20	55	20	40	50	40
1. Forward Trace	0	0	5	10	15	10
2. Unit Locations	10	25	10	10	20	15
3. Main Efforts	0	0	10	15	20	15
4. Combat Support	0	5	10	8	5	5
5. Echelonment	0	15	5	8	10	5
6. Reserves	10	15	10	12	10	10
7. Staging Areas	50	10	10	8	5	15
8. Combat Service Support	10	5	10	12	5	5
9. Air Forces	10	10	10	7	5	5
10. C2	10	15	20	10	5	15
B. Strength of Enemy Forces by Echelon	20	35	20	40	30	20
1. Readiness	30	25	30	40	55	25
2. Identified Resupply Rates	0	10	10	5	5	6
3. Identified Critical Nodes	5	25	15	15	5	25
4. Levels of Morale	5	5	15	10	5	6
5. Strength of Air Forces	30	20	10	15	5	13
6. Nuclear, Biological, and Chemical	30	15	20	15	20	25
C. Recent and Present Significant Activities	60	20	60	20	20	40
1. Combat Action	0	0	20	20	25	20
2. Maneuver/Movement	5	10	20	20	25	30
3. C2	20	30	30	20	10	20
4. Sustainment	20	25	15	10	10	15
5. Intelligence	50	25	10	20	20	10
6. Other	5	10	5	10	10	5

TABLE 7. Comparison of Relative Importance Weights Continued.

	Peacetime			Wartime		
INFORMATION ITEM	G3	G2	FSC	G3	G2	FSC
IV. DESCRIPTION OF ECOAs	10	20	20	50	25	30
A. Enumerates Possible ECOAs	30	60	70	10	70	60
1. Mission	20	0	20	4	15	10
2. Objective	20	10	10	4	10	10
3. Forces	20	25	10	9	15	10
4. Terrain Considerations	0	20	0	2	5	0
5. Echelonment	10	20	10	9	5	10
6. Main/Supporting Effort	0	5	10	18	10	10
7. Fires (includes Air Support)	0	10	15	3	10	30
8. Time/Distance Factors	0	0	5	14	5	10
9. Threat Advance	10	10	0	14	10	0
10. Probability	20	0	20	23	15	10
B. Other Information for Probable ECOAs	70	40	30	90	30	40
1. Center of Gravity	40	15	40	60	10	25
2. Vulnerabilities	40	50	20	30	60	25
3. High Value Targets	20	35	40	10	30	50
V. INTELLIGENCE CONSIDERATIONS	20	10	30	10	20	20
A. Critical Uncertainties	80	40	40	70	31	30
B. PIRs	20	30	15	20	31	30
C. Information Requirements	0	10	15	0	19	10
D. NAIs	0	20	30	10	19	30

important criterion to the G3 in the second situation and the least important in the first situation. In contrast, "Description of Enemy Courses of Action" was the most important of information needs to the G3 in the first situation and tied for least important in the second situation. The "Reference to Relevance" and "Intelligence Considerations" increased somewhat in importance and the "Description of Enemy Courses of Action" decreased somewhat in importance in the second situation for the FSC. However, in comparison to the G2 and G3, the FSC's relative weights were not as situationally dependent.

Figure 10 offers a comparison of the relative weights of the G3 and G2 for the contexts of wartime and peacetime. From this comparison it is obvious that the G3 and G2 have different priorities for information. It is interesting to note the fairly wide variation in weighting in one context versus the other. In terms of the rank ordering of relative weights, the comparison of peacetime to wartime demonstrates a reordering of priorities of the high-level factors for both the G3 and G2. This offers evidence for the need to elicit weights within explicit contexts defined by the external factors.

MAUA Conference Summary

Although further research is obviously required, the results obtained during the Fort Leavenworth conference are quite encouraging. In total, they demonstrated that MAUA represents a viable approach for (1) better understanding MI users' subjective, concept of utility, and (2) providing an explicit, quantitative approach for measuring the utility of different items of information for various users under different situational contexts. These were the two principal goals of our efforts to

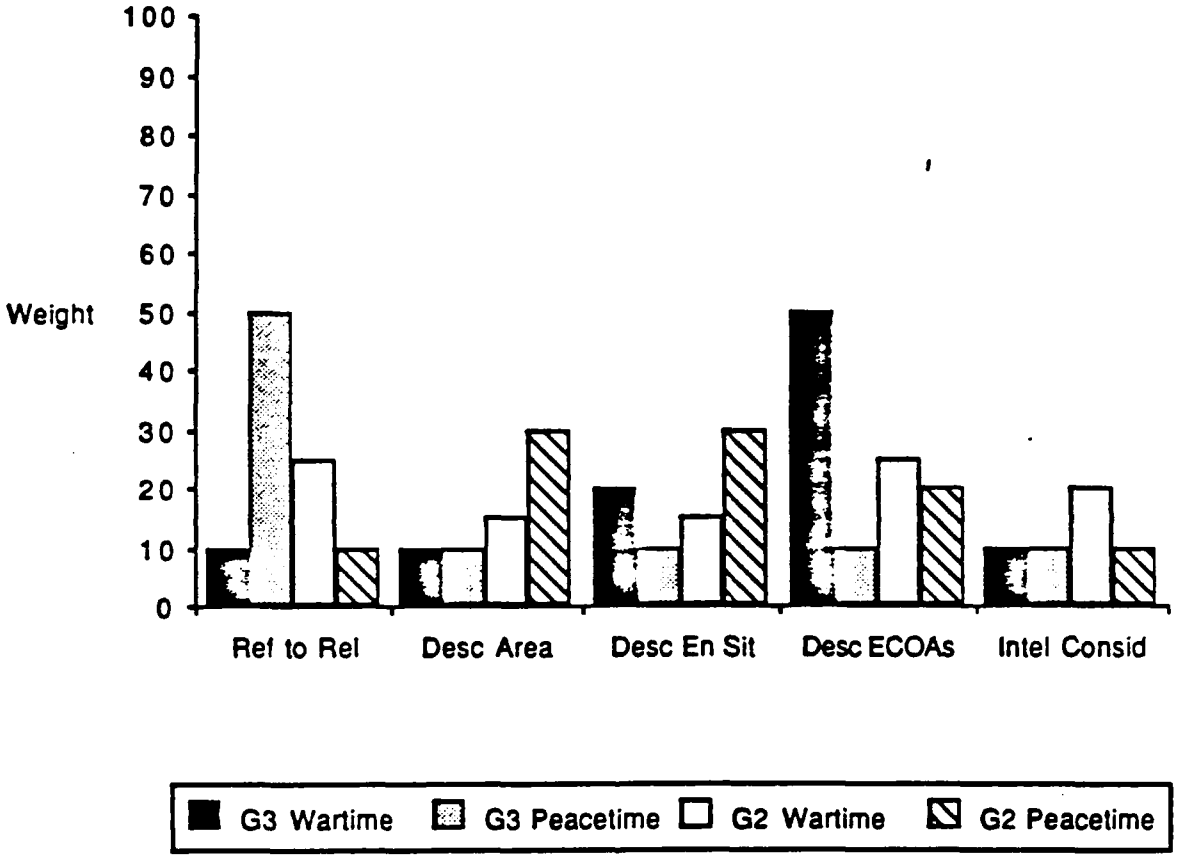

Figure 10. Comparison of relative importance weights of G3 and G2.

apply a MAUA approach within the first year of the project. Moreover, it is the hypothesis of members of the project team that MAUA can also be used to measure other utility dimensions inherent in MI output as well. The multidimensional nature of utility will certainly be a major focus of research in Year 2 of the project.

The most surprising and possibly most important result of the MAUA conference relates to the hierarchy of information items. The strawman hierarchy developed prior to the conference was doctrinal-based, drawn primarily from the intelligence estimate. Conference participants offered significant modifications to the hierarchy in an effort to fit their needs from intelligence outputs. This modified hierarchy is non-doctrinal in nature, though the Fort Leavenworth participants described the reorientation as "emerging doctrine" rather than non-doctrinal. In contrast to the hierarchy related to the intelligence estimate, the modified hierarchy relates to principal steps in the IPB process. The relationship between the intelligence process and intelligence users will be facilitated greatly by the IPB linkage to intelligence outputs.

Results of Military Intelligence Product Usage Questionnaire

The MI PUQ was distributed to current Army officers who participated in the individual interviews and the decision conferences held at Fort Leavenworth and Fort Carson. A limited number of questionnaires was sent to interested current Army officers that could not be visited for the individual interviews. The data reported here were collected during the first year and well into the second year of this research. The findings reported here are based on the questionnaire responses of 23 individuals, who are currently serving in active duty positions.

Survey Participant Demographics

The ranks of individuals completing the questionnaire included: Lieutenant Colonel (10); Major (11); Captain (2). 19 of the individuals participating in the survey are currently serving in division staffs. The remaining 4 included in the survey are serving as instructors at the Command and General Staff College.

The individuals who participated in this survey included: 11 individuals from operations (including G3s, G3 Plans, and G3 Operations; 2 from intelligence (both G2s); 5 from fire support (FSCOORD); 3 chemical officers; and 2 from logistics (including one G4). Given the large number of operations personnel in the survey, the data are reported by group: the operations group (N = 11) and the non-operations group (N = 12).

Intelligence Product Familiarity

Detailed descriptive statistics for product familiarity, including mean, standard deviation, median, and maximum and minimum ratings, are contained in Appendix F. Table 8 contains the mean familiarity response for each product and groups of products by user groups. The mean figure for the groups of products (e.g., doctrinal products) was derived from individual participant's mean rating of each product group.

A considerable range of familiarity with the intelligence products is evident from a review of Table 8. For the operations users, briefings received the highest familiarity rating. For the non-operations users, spot reports and situation reports

TABLE 8. Intelligence Product Familiarity.

PRODUCT	MEAN RATING	
	OPERATIONS USERS	NON-OPERATIONS USERS
Doctrinal Products:	3.6	3.8
INTSUM	4.3	4.3
PERINTREP	2.9	3.8
SUPINTREP	2.3	2.8
Intelligence Annex	4.4	4.3
Intelligence Estimate	4.5	4.2
INTREP	3.6	3.8
SITREP	4.3	4.6
Imagery Reports	2.2	2.5
Spot Report	4.5	4.6
Responses to Information Requests	3.1	3.1
Briefings:	4.7	4.3
Formal	4.7	4.2
Informal	4.7	4.4
Non-Doctrinal Products:	4.1	3.5
Collection Priorities	4.0	3.4
NAIs	4.1	3.4
TAIs	4.1	3.5
Target List	4.4	3.7
Target Nomination	4.0	3.7
Target Priority List	4.1	3.5

FAMILIARITY SCALE

5 - Extremely Familiar
4 - Very Familiar
3 - Moderately Familiar
2 - Slightly Familiar
1 - Not at All Familiar

received the highest familiarity rating. Imagery reports received the lowest familiarity rating from both groups of users.

The mean familiarity rating for the doctrinal products as a group is quite close for both user groups. The largest difference in familiarity is found with the non-doctrinal products, the group of operations users showing a higher mean familiarity than the non-operations group. While a difference in familiarity ratings exists between the groups, the inclusion of non-doctrinal products in the list of intelligence products did not appear to be problematic in terms of recognition of these items as products by the majority of respondents.

Intelligence Product Usefulness

Product usefulness ratings were compiled for all products receiving a minimum familiarity rating of 2. In this manner, usefulness data were not accepted from survey participants who indicated that they were "Not at All Familiar" with a particular product. The reason for this minimum familiarity requirement was based on the need for compiling opinions about products that had a basis in the respondent's experience rather than doctrine or some unidentifiable source.

Detailed descriptive statistics for product usefulness, including mean, standard deviation, median, and maximum and minimum ratings, are contained in Appendix F. The mean usefulness ratings by user group for all products and products groups are contained in Table 9.

While the mean usefulness ratings for the group of doctrinal products is rather close between the two user groups, a sizable difference was shown in the ratings of the non-doctrinal group of products (which was significant on the

TABLE 9. Intelligence Product Usefulness.

PRODUCT	MEAN RATING	
	OPERATIONS USERS	NON-OPERATIONS USERS
Doctrinal Products:	3.6	3.7
INTSUM	4.1	4.0
PERINTREP	3.5	3.4
SUPINTREP	2.8	3.0
Intelligence Annex	4.0	3.5
Intelligence Estimate	4.3	4.0
INTREP	3.6	3.8
SITREP	3.9	4.4
Imagery Reports	3.1	2.8
Spot Report	3.7	4.1
Responses to Information Requests	3.1	3.2
Briefings:	3.5	3.6
Formal	3.3	3.4
Informal	4.0	3.9
Non-Doctrinal Products:	3.9	3.0
Collection Priorities	3.6	2.9
NAIs	4.0	3.3
TAIs	4.2	3.3
Target List	3.9	3.4
Target Nomination	3.8	3.0
Target Priority List	3.8	3.2

USEFULNESS SCALE		
5 - Extremely Useful	3 - Moderately Useful	1 - Not Useful
4 - Very Useful	2 - Slightly Useful	

Wilcoxon Signed Rank test). The products contained in the non-doctrinal product group include numerous outputs of the IPB process. The high usefulness ratings of the non-doctrinal products by the operations group may indicate that IPB type outputs are of prime utility to operations users.

Examination of Table 9 offers an interesting comparison of product usefulness for the two groups of users surveyed. For the operations group of users, six products received a mean rating of 4.0 or higher, compared to four products for the non-operations group. Two products, the intelligence estimate and the INTSUM, received high ratings from both groups. While two non-doctrinal products, TAIs and NAIs, were in the top six products for the operations group, they were among the lower rated products of the non-operations group. Both user groups rated informal briefings higher than formal briefings. Within the group of doctrinal products both groups gave rather low ratings to the same products, SUPINTREPs, imagery reports, and responses to information requests.

Intelligence Product Frequency of Use

As noted earlier, the rating of frequency of product use was not restricted to a single response per product. The data were summarized in the following manner: for each group of products (e.g., doctrinal products), a count was made of the number of responses per category (e.g., "Don't Use"); this was then converted to a percentage of category responses to the total number of responses on that product. Appendix F contains the response percentage to the question for each product by user group. The data reported on frequency of product use are restricted to those products receiving a minimum familiarity rating of 2.

Table 10 offers a summary of the percentage of responses of each category of users for each product group. The response percentage for frequency of use categories for the group of doctrinal products is quite similar for both operations and non-operations users. Doctrinal products received a slightly higher percentage of "Don't Use" responses from non-operations users. Considerable differences existed between the groups on their frequency of use responses regarding briefings. Regarding non-doctrinal products, the two groups of respondents differed to a considerable extent in two categories, namely "Don't Use" which was higher for the non-operations group, and "Use Repeatedly," which was considerably higher for the operations group. Differences existed between the groups on all categories of frequency of use of briefings. The largest difference was seen on the categories of "Use Repeatedly" (higher for the operations users), "Use Once" (higher for the non-operations users), "Use Right Away" (higher for the operations users).

Intelligence Product Reason for Use

As discussed earlier, this portion of the questionnaire was added after the first data collection effort. The number of respondents reflected in the following results discussion is based on 14 individuals, 5 operations users, and 9 non-operations users.

Respondents were permitted to select as many categories as needed to classify their reason for using a particular product. Respondents were given four categories to select from in addition to an "other" category which they were asked to specify. The categories of "Only Source" and "Best Source" appeared to be viewed as mutually exclusive to respondents in that none of the products were classified as

TABLE 10. Intelligence Product Frequency of Use.

Product Type and User Group	Don't Use	File	Use Once	Use Repeatedly	Use Right Away
Doctrinal Intelligence Products					
Operations Users	7%	7%	28%	31%	26%
Non-Operations Users	12%	7%	29%	29%	24%
Briefings					
Operations Users	0	0	19%	58%	23%
Non-Operations Users	4%	7%	29%	29%	32%
Non-Doctrinal Intelligence Products					
Operations Users	4%	6%	21%	50%	19%
Non-Operations Users	14%	11%	19%	35%	21%

both "only" and "best." A frequency of response was calculated for the products in the same manner as discussed in the results of the frequency of use question. Appendix F contains the response percentage for each product. As with the previous questions, only those products receiving a minimum familiarity rating of 2 are included in the reporting.

Few intelligence products received the "Only Source of Information" reason for use by both user groups, namely SUPINTREPs, imagery reports, and formal briefings. Those three reports were the only ones given the only source reason for use by the operations user group. With the exception of the SITREP, spot report, informal briefing, and TAIs, all intelligence products received only source of information responses from the non-operations user group.

The non-operations group responded with the "Best Source" reason for use for all products, though in many cases the percentage of responses was quite low. The operations group, however, did not give a "Best Source" reason for use to all products. In particular, imagery reports, formal and informal briefings, target list, and target nominations were not identified as used because these were the best source. "Easy to Use" was the reason for use of the target list and target nomination products, and to a lesser extent the reason for use of briefings.

There was little agreement between the operations and non-operations user groups on the "Easy to Use" reason for product use. The only product both groups agreed on was the SUPINTREP, which received one third of the responses in each group. The INTSUM, for example, received 80% of the responses in the "Easy to Use" category in the operations group, while receiving only 10% in the non-operations group.

Both the operations and non-operations user groups agreed that the primary reason for use of SITREP and the spot report was the response "Most Timely." The groups also agreed on a number of products that are not used because of the timeliness aspect (including the INTSUM, SUPINTREP, collection priorities, target list, target nomination, and target priority list).

Table 11 provides a summary of the reason for use of the product groups by user groups. Review of this table shows substantial differences between the user groups. The most frequent reason for use of all products by the operations user group was "Easy to Use." The non-operations user group, on the other hand, most frequently selected "Best Source" as the reason for use of both doctrinal and non-doctrinal products.

Suggested Product Improvements

Offering suggestions for product improvement was at the discretion of the survey respondent. Numerous participants took the opportunity to suggest improvements for some intelligence products. While all recommendations suggested by survey participants are contained in Appendix F only a few will be noted here. The recommendation to increase graphics appears a number of times for various products. One respondent to the questionnaire suggested a new format for the intelligence summary, termed a graphic INTSUM. This respondent indicated that his division uses the graphic INTSUM. This individual, a division G3, noted that the graphic INTSUM was extremely useful, and characterized his reasons for using it as Best Source Available, Easy to Use, and Most Timely. He further suggested the need for the widespread use of the graphic INTSUM.

TABLE 11. Intelligence Product Reason for Use.

Product Type and User Group	Only Source	Best Source	Easy to Use	Most Timely
Doctrinal Intelligence Products				
Operations Users	5%	28%	37%	30%
Non-Operations Users	15%	37%	24%	25%
Briefings				
Operations Users	20%	0	70%	10%
Non-Operations Users	11%	11%	33%	44%
Non-Doctrinal Intelligence Products				
Operations Users	0	36%	48%	16%
Non-Operations Users	28%	39%	33%	0

In general, few products were added to the survey by respondents. In addition to the graphic INTSUM noted above, one participant from an intelligence background added the situational template, decision support template, and courses of action overlay. This individual recommended the use of decision support graphics supported by a short written matrix to convey intelligence information. Further, he noted the value of templates as intelligence products.

Open-Ended Questions

As discussed in the technical approach, survey respondents were not required to answer the open-ended questions. However, many respondents did elect to answer the questions. Some survey respondents provided very lengthy discussions about their views and experience with intelligence, as opposed to short answers to each of the questions. Appendix F contains all of the written responses received in the survey. Table 12 provides a few selected comments from those obtained. It should be noted that not all of the comments included came from individuals interviewed during the individual interview portion of the research. While the comments are not attributed to specific individuals, the comments are those of a range of intelligence users including: G3s, G3Plans, G2, FSC, and G4.

A review of the comments contained in Table 12 highlights some common concerns about intelligence. The need for intelligence to go beyond their data to predictions is quite evident. This concern will be addressed in our future research concerning the evaluation of intelligence output. The concern about information overload was noted in comments, providing further confirmation to issues raised in the individual interviews. One respondent in particular raised concerns about the

TABLE 12. Selected Comments from Survey Participants

"We must teach risk versus gain; we must teach 'how to think'; the process if properly taught will result in a more timely and credible product. Good analysts and good analysis is not pontification but a usable credible product, i.e. the (enemy) is here in this strength and he is going to do this."

"Intelligence reporting is not rote and the success of intelligence reporting is not measured by pages produced but rather in lives saved or lost."

"(Intelligence) needs to be more specific at the risk of being wrong."

"Intelligence reports should go farther in stating or estimating the impact of new information as it relates to the tactical situation and the capabilities/probable courses of action available to the enemy. That is how does it correlate with what we already knew."

"I've never questioned the credibility of intelligence analysts -- they've always proven to know a lot more about enemy doctrine, organization for combat capabilities, current situation than me. Sometimes I have disagreed with their conclusions -- but it's ok to be wrong as long as an earnest effort was made."

"The biggest problem I'd had is in getting the analyst to commit himself. They always stop short of saying this is what I believe the enemy is going to do."

"Overall, reduce the bulk, size, and volume of (intelligence) reports."

"Generally, the most significant shortcoming relative to intelligence involves the overwhelming volume of information their officers produce. Suggest commander receive critical information only."

"Brevity is the key to future needs. Short, concise pieces of very usable information that can be transmitted via computers."

possibility of the automated transmission of information in the future and how it will require changes in the way intelligence is communicated.

Respondents were asked to specify any assumptions that they may have made about the intelligence products when making their ratings. Some respondents indicated the assumption that the products were delivered in a timely manner. One respondent indicated that his appreciation for timeliness was included in his judgment (noting that reports such as the INTSUM and PERINTREP are always delivered long after the "cut-off" date of the report and spot reports are more timely). Some respondents indicated that they assumed accuracy in the products. One respondent indicated that he assumed the analyst and his products were credible and that the analyst was knowledgeable of the enemy/situation he was analyzing. One respondent noted that the credibility of intelligence starts very low and may improve over time.

The final open-ended question in the survey asked the respondents, if given the purpose of our study of the operational perspective of military intelligence, was there anything they would like to point out to the researchers? Some individuals offered their views. One respondent suggested that we look at the physical location of elements of the intelligence shop and operations shop in garrison as well as in a tactical scenario. While the respondent did not elaborate the point, it might be an interesting notion to look at whether or not physical proximity is a predictor of user satisfaction with information provided or credibility of intelligence producers or whether close proximity fosters more informal exchanges. Another respondent suggested that intelligence should spend greater effort on the development of intelligence and reduce the information provided to the operational user.

Discussion of Results

Non-doctrinal products, specifically results of the IPB process, are familiar to both operations and non-operations users. Further, in the opinion of the operations users participating in this survey, these non-doctrinal products are considered more useful than many doctrinal products, though this view is not shared by non-operations users. Non-doctrinal products were viewed by the operations user group as quite familiar, quite useful, repeatedly used, and easy to use. These findings lead to the conclusion that the IPB products contained in the survey are heavily oriented toward the operations user, certainly more so than toward the non-operations users.

Methodology Results

A number of lessons were learned from the various methodologies used in the research conducted to date. Open-ended interviews tend to be time-consuming by their nature. This is particularly the case when participants must recall information, such as listing information needs for specific contexts. Preparation of handouts that participants can refer to in identifying their requirements appeared to be quite advantageous in our work. The prepared list served two functions: (1) to cue participants of items that they might not remember; and (2) to save time.

As noted earlier, "read-ahead" packages were prepared and sent to participants in the Fort Leavenworth conference in advance of the conference. The read-ahead package was intended to provide each participant with an understanding of the objectives of the conference and the research effort as well as to provide

detailed strawman structures of information needs and the situational context. The use of read-ahead packages proved to have a number of advantages: (1) it provided the military coordinator with detailed information about the purpose and objectives; (2) it provided participants with the knowledge of what the researchers expected of them; and (3) it allowed participants to consider the problem they would address at the conference in advance. The third point is important in that it provided the opportunity for researchers to obtain more carefully considered judgments from participants than would be likely without a read-ahead package.

FUTURE PLANS

Overview

Year 1 of this research effort focused on how the intelligence user views MI unit effectiveness and usage of intelligence products by users. During Year 2 of the research effort, the orientation will shift to the intelligence process side of the MI unit effectiveness picture. This next phase of research will integrate the notion of utility measurement with diagnostic procedures to identify and remedy low utility scores. Year 3 of the research effort will be concerned with the validation of the research findings from Years 1 and 2.

Measurement Instrument Development

In Year 1, MAUA was demonstrated as a viable basis for the development of the measurement instrument. Year 2 research efforts will complete the development of a measurement instrument for MI. Completion of the measurement instrument requires three separate tasks: hierarchy refinement, hierarchy application, and refinement of the external factor settings.

Information Needs Hierarchy: Refinement

The Year 1 results of this research effort have produced a starting base for building a measurement instrument for MI. One important outcome of the first year of research was a hierarchy of the information needs of intelligence users and weights of the hierarchy branches for two different situational contexts. Situational variables have been identified that define the context for user utility. Further, a number of utility factors have been identified by various users of intelligence.

The organization of information needs shown in the hierarchy must be confirmed by additional intelligence users and weights for the hierarchy elicited. Our approach is to conduct additional decision conferences with current division staff officers. The conferences will be conducted in the same manner as the MAUA conference conducted during the first year. Read-ahead packages will be developed that contain the information needs hierarchy and revised situational factors resulting from the MAUA conference. Both the hierarchy and situational factors will be reviewed and suggested modifications elicited from conference participants. Weights will be elicited from the conference participants on the hierarchy for two different contexts.

Information Needs Hierarchy: Application

The information needs hierarchy can be viewed as a database of information needs to which user utility can be applied. Preliminary trials in weighting the hierarchy by field personnel demonstrates that we can discriminate between peacetime and wartime information needs as well as between users. Viewing the hierarchy as a database or standard might be termed a prescriptive application of the hierarchy. What we would like to develop is a profile of how different users would weight the hierarchy in different situations. The results of Year 2 will determine how many profiles might be needed to represent output utility for different users in different situations. For the training environment this would translate to the development of user profiles. Such a profile could be viewed as bringing a "mythical G3" into the classroom to serve as a surrogate user for the evaluation of student-generated intelligence output. The profile would essentially be a weighted

database of information items represented by the information needs hierarchy. Further, the profile would be specific for a "mythical" user (G3, G4, FSC, etc.) as well as situationally dependent. The contents of student intelligence outputs could then be assessed by instructors against the profile of a mythical user. In this way, students could receive selective feedback about the potential assessment of their outputs from the perspective of the possible users of that output. At this point, we cannot be certain that a single "mythical" user profile for each user type will be developed. A single profile is likely if a high degree of consensus exists between user weights that will be elicited during Year 2 site visits. If normative profiles cannot be achieved due to lack of consensus, then multiple user profiles will be necessary.

In order to address MI performance, in the classroom or field exercises, a scoring approach must be developed that includes the other utility factors identified in Year 1 research. A number of concerns must be addressed in the development of a scoring approach. For one, there is a question of what should be scored. One alternative is to score every output on an individual information item basis, which could be very labor-intensive in the context of an exercise in addition to the possibility of a rater "missing" outputs. An alternative is to assess MI performance on the basis of the outputs provided to users over a period of time, such as 24 hours. If this approach is selected, the information item hierarchy would need to be weighted from the time period perspective; i.e., the relative importance of receiving information items within a particular time period.

The next step in scoring development is to refine and translate the full set of utility factors (e.g., accuracy, timeliness) into qualitative dimensions for

assessment. The prevailing influence on the direction we take is how well the score can be used to diagnose problems in the intelligence process. A score in and of itself has little value to the intelligence process. If a unit receives a low score in providing high utility information to a user, the important question to answer is "What went wrong"? Given the ultimate objective of determining what went wrong, the scoring approach developed must be sufficiently sensitive to serve as a pointer into problems in the process.

Context Refinement

The situational factors identified by the first-year effort include five separate factors with three or more levels to each factor. The permutation of factors and levels leads to a rather large number of situational cells which is the product of: (echelon levels) x (levels of conflict) x (number of users) x (mission types) x (application levels) = 3 x 3 x 5 x 3 x 4 = 540. However, since our effort is concerned with the development of only one echelon this reduces the number to 36 cells (levels of conflict x mission types x application levels) for a particular user. While the numeric reduction is an improvement, the potential requirement for 36 profiles for each intelligence user at division echelon might be viewed as impractical for the training environment. It is necessary that we attempt to look for ways to reduce the set of situational factors.

The set of situational factors will be reduced in two ways. First, using SMEs within the project team, we will look for combinations that are unrealistic. A cell such as peacetime/garrison/execution is not likely to be a realistic situation to consider. Each combination of level of conflict, mission, and application will be

assessed for realism; if the combination does not represent a possible situation, it will be dropped from consideration. Next, we will look for combinations of factors in which the weighting of the utility hierarchy does not vary by user. Participants in the Fort Leavenworth conference suggested that the situational factors could be combined in such a way that weightings would be invariant. We will determine if such situational combinations can be made.

Development of Process Corollary to User Utility

The research effort to date has concentrated on the development of a measurement instrument to be used to assess intelligence outputs from a user perspective. To provide guidance to the intelligence training domain, it is necessary to go beyond the evaluation of outputs into the intelligence process itself. In other words, guidance must be developed to identify the source of problems associated with a less than adequate output. A further step is to identify the remedies that could be employed to improve an output. By developing this type of guidance, we will not leave the intelligence community with the idea that the only approach to providing users with the highest utility output is to produce individual outputs for each user. Such a solution would be untenable from an intelligence perspective because of resource implications.

In the second year of the research, we will trace user utility into the intelligence process. A number of steps will be required, including:

- Developing a model of the intelligence process
- Defining the supporting intelligence infrastructure
- Mapping the infrastructure to the intelligence process

- Mapping the output utility factors to the process
- Developing remedies for utility shortfalls.

We will draw on the intelligence expertise on the research team to flesh out each step identified above. It is important, however, that active Army intelligence personnel be queried to validate our models. While our models of the processes are likely to be simplifications, they must be acceptable to the intelligence community as reasonable. The research team will work with senior Army officers at the Intelligence Center and School in an attempt to capture the current thinking of intelligence doctrine in the process model development. In addition, interviews with intelligence personnel could be conducted in conjunction with the decision conferences held in the second year of the research. Individuals to be interviewed would include active Army personnel currently serving in roles such as G2, G2 Operations, MI battalion commander, Chief of All Source Production Section, Chief of Collection Management & Dissemination, and Senior Order of Battle Technician.

Approaches to Validation

The validation of the research findings of this effort is critical to the ultimate success and implementation of a method for measuring the effectiveness of an MI unit. Validation is required of the measurement instrument and the diagnostic procedure for tracing user utility into the intelligence process.

Validation of Measurement Instrument

Any single methodological approach runs the risk of failing to identify some key factors and developing only a partial understanding of the problem. To avoid this possibility, a second method will be employed during the second year of the research to serve as a validation of the findings of the MAUA approach.

Two methods have been considered that could provide the necessary validation. One method, a factor analytic approach, is a survey-based approach. This approach uses self-administered pencil and paper survey instruments to structure the problem space and develop a metric. With this approach, survey respondents are asked to rate several MI outputs on a list of potential attributes. The data collected are evaluated using factor analytic techniques to determine the higher level factors (e.g., description of the battlefield area, description of enemy situation) that determine the conceptual structure of the problem area. Using the results of the initial survey, a final version of the rating scales would be developed that could be used to quantitatively assess the components of factors of output utility. A second survey would be used to determine how the relative importance of the factors change depending on the user and the situation.

The factor analytic approach represented an attractive possibility since it is a powerful methodology from a statistical standpoint. However, this approach was rejected for two reasons: survey participant requirements and time. The number of individuals required for the factor analytic approach was extremely high and some requirements could not be met with the active Army personnel within the continental United States. An additional problem was the fact that such an extensive survey could not be accomplished within the second year of the research effort.

Policy capturing has been selected as the most viable approach to the validation of the measurement instrument. Policy capturing, a proven method in the area of social judgment theory, does not have the problems inherent in the factor analytic approach in terms of sample size requirements. Most importantly, policy capturing offers an approach to validation of the measurement instrument that focuses on the judgment of intelligence users.

Policy Capturing: Approach

Policy capturing appears to be a viable technique for the validation of the measurement instrument. Policy capturing uses multiple regression analysis to develop a statistically based model indicating the relative importance of different attributes when predicting an individual's judgments. The attributes represent the independent variables in the multiple regression analysis; the individual's judgments represent the dependent variable.

Policy capturing can be used in a number of ways for validation purposes. The information needs hierarchy, when weighted, predicts the utility of information. Policy capturing could be used to validate these predictions. Experimentally, policy capturing could be used at any point in the hierarchy to validate predicted utility of information items. This could be accomplished by presenting subjects with intelligence outputs, specifically designed to represent different values of information items. In other words, hypothetical intelligence outputs would be developed to represent different values predicted from the MAUA hierarchy. An alternative approach would be to present subjects with the scores of a "fictional" unit's performance. For example, a fictional unit may have received a

high score on "description of the battlefield area" and "description of enemy situation" and a low score on "description of enemy COAs." The weighted MAUA predicts how this combination of scores is likely to be assessed for a particular user in a particular context. In either case, subjects would be asked to provide an overall judgment, of the output or the unit's performance. The attributes under study would have low, medium, or high values in the case of outputs. Performance attribute values would be randomly generated. The correlations between attribute values over all outputs or performances approach zero so that we have statistical independence among the attributes for the multiple regression analysis. The linear model for analyzing an individual judgment is represented as follows:

$$Y_{ij} = \sum_{k=1}^{m} b_{ik} x_{jk} + c_i + e_{ij}$$

where

Y_{ij} = The judgment of individual i for profile j (e.g. a hypothetical output or a hypothetical unit's performance score)

m = The number of attributes

b_{ik}, $k = 1, m$, the value on attributes, raw score regression weight on attribute k (note: when normalized and divided by the sum of normalized weights it indicates the relative importance of the attribute for the individual's judgments)

x_{jk} $k = 1, m$, the value of attribute k for profile j

c_i Constant term for individual i

e_{ij} Is the residual error from the model of individual i for profile j.

Consequently, one can determine the relative weight a participant places on each attribute when evaluating the outputs or units by examining the (normalized) beta weights. The larger the beta weight, the more important the attribute. Moreover, the correlation between an individual's actual judgment and the judgment predicted by the multiple regression model (i.e., the multiple correlation coefficient, R) \represents a quantitative measure of the quality of the model. Low values of R (e.g., $\leq .5$) would indicate the inadequacy of the model because of the following reasons: (1) the individual is inconsistent in using the model to evaluate the products; or (2) the individual is using a different type of model to evaluate the products; or (3) we failed to capture other important variables that the individual is using to evaluate the products.

With policy capturing we can generate relative weights for user types (e.g., G3, G2, etc.). An alternative or additional analysis could regress the independent variable values on the averaged judgments of the participants in each group. Importantly, the policy capturing data may be used to validate the MAUA weights by applying the weights to the products to get predicted values for the products and, then, correlating the predicted values with the actual (averaged) judgments. High correlations would validate the group MAUA weights; low correlations would suggest problems analogous to those for low R values.

Policy Capturing: Advantages

Policy capturing has been extensively used to generate quantitative measures of interpersonal agreement and interpersonal understanding, a capability applicable to

our objective. Policy capturing offers a number of advantages in this research context, including:

- Policy capturing builds on the MAUA approach to metric development by using the factors already identified.
- Policy capturing will be implemented by having participants evaluate MI outputs or scores of fictious units, that have predicted scores from the MAUA-based utility metric.
- The results of policy capturing are statistically based models indicating the relative importance of each MI attribute on the participant's judgment, facilitating a quantitative, multimethod comparison between the relative weights in the MAUA hierarchy and those generated by policy capturing for different users in different contexts.
- The MAUA weights may be applied to the attribute values for each output or unit performance to derive a set of MAUA-based predicted judgments, thereby using the correlations between (a) MAUA-based predicted judgments and the actual judgments, (b) the policy capturing-based predicted judgments and the actual judgments, and (c) the MAUA-based and policy capturing-based predicted judgments for validation purposes.

Validation of Diagnostic Procedure

The validation of the diagnostic procedure requires the validation of the numerous components of the procedure. First, we must validate the process and infrastructure models and the mapping of the two. This will be accomplished in two ways. First, our strawman models will be presented to and modified by senior

intelligence personnel at the Intelligence Center and School. In this way, the model will be validated for doctrinal soundness. The revised model will be reviewed by intelligence personnel at FORSCOM divisions. The reason for validation of the models by different groups is that the diagnostic procedure needs to be applicable to the classroom as well as the field.

The actual diagnostic procedure of tracing a low score to a point in the process must be validated. One approach to the validation is war gaming low process scores with intelligence staffs to determine the consistency of the pointers into the process. This procedure could be used with division intelligence staff personnel such as the G2, MI Battalion Commander, G2 Operations, Chief of All Source Production Section, Chief of Collection Management & Dissemination, and the Senior Order of Battle Technician. Personnel could be presented with a series of low process scores and asked to diagnose the process and isolate the problem.

The remedies developed for utility shortfalls must also be validated. In Year 2 researchers will investigate a number of possible approaches to the validation of remedies. Since remedies may have a cost of implementing associated with them, we will consider techniques in the area of cost-benefit analysis as offering a possible validation approach.

Performance Based Validation

While the validation of the methodology is important, it will not answer one question: "Does increasing the utility of intelligence outputs improve the performance of the operational user?" This is essentially a bottom line question to

consider and the answer requires a performance based evaluation of intelligence users.

The evaluation is likely to be concerned with individual performance of intelligence users rather than on team performance, such as a staff during an exercise. The reason for not focusing on team performance is that there are a number of variables in team performance that could not readily be controlled. In a staff exercise, one could not conclude that the quality of intelligence "made all the difference" in the results of the exercise. Focusing on individual performance, while more artificial, is more controllable and hence desirable.

The Army Research Institute is in the process of developing an experimental laboratory to study division level command and control decision making. This facility, called the Experimental Development, Demonstration, and Integration Center (EDDIC), is located at Fort Leavenworth and would allow the experimental control of information to subjects. Importantly, EDDIC will produce a wide range of dependent measures including comparisons with school book solutions, time, information use and flow.

Practicality of the Measurement Methodology

There are some practical concerns that need to be addressed in the development of the measurement methodology. Practical concerns in some ways reflect the conflicting nature of applying research to the military setting. On the one hand, researchers may strive for developing a rigorous methodology that meets the standards of an academic community. On the other hand, the military setting may appreciate the standards but have somewhat different concerns. It is reasonable to

assume that the MI setting would prefer a methodology that can be used by military instructors rather than usable only by scientific observers. Further, the MI setting is likely to be concerned with how rapidly they may provide feedback to a unit on it's performance.

The measurement methodology must be easily applied and not require an inordinate expenditure of resources to apply. For example, a methodology that requires a large number of data collectors might not be practical. Even less practical would be a measurement methodology that requires extensive "off-line" analysis. We must strive for a methodology that can find the problems in MI effectiveness, vis-a-vis low scores, and diagnose the problem and suggest remedies in near real time. Optimally, the evaluation of one twenty-four hour assessment period would lead to improved performance during the next twenty-four hour assessment period. Such near real time evaluative feedback will be an objective of the research.

A related practical concern deals with the manner in which scoring will be accomplished. Scoring needs to be handled at the lowest attribute level of the hierarchy and there are a number of separate scoring dimensions, this would translate to a rather large number of scoring questions for evaluation. This would raise a practical concern in implementation. Because of practical concerns about time required to administer scoring questions and particularly time intrusions on users, we are approaching the scoring methodology on the basis of high discriminability scoring for diagnosis as opposed to comprehensive evaluation. Other implementation options such as automated support could substantially reduce adminstration time and shorten the feedback loop.

Expected Products and Milestones

This project is developing a methodology for measuring the effectiveness of MI. As envisioned, this methodology may be used to assess students as well as MI units in an exercise. To reach our objective a number of milestones are expected to be accomplished in Year 2 as shown in Figure 11. The products that will be produced by the conclusion of Year 2 include:

- Normative profiles for classroom use
- Measurement instrument for scoring MI unit performance from a user utility perspective
- Methodology for diagnosing low scores in MI unit performance
- Identification of potential remedies for diagnosed problems
- Technical report of Year 2 findings.

The expected results of Year 3 include:

- Validation of profiles (policy capturing for validating MAUA predictions)
- Validation of diagnostic procedure
- Validation of remedies
- Documentation for implementing the measurement methodology.

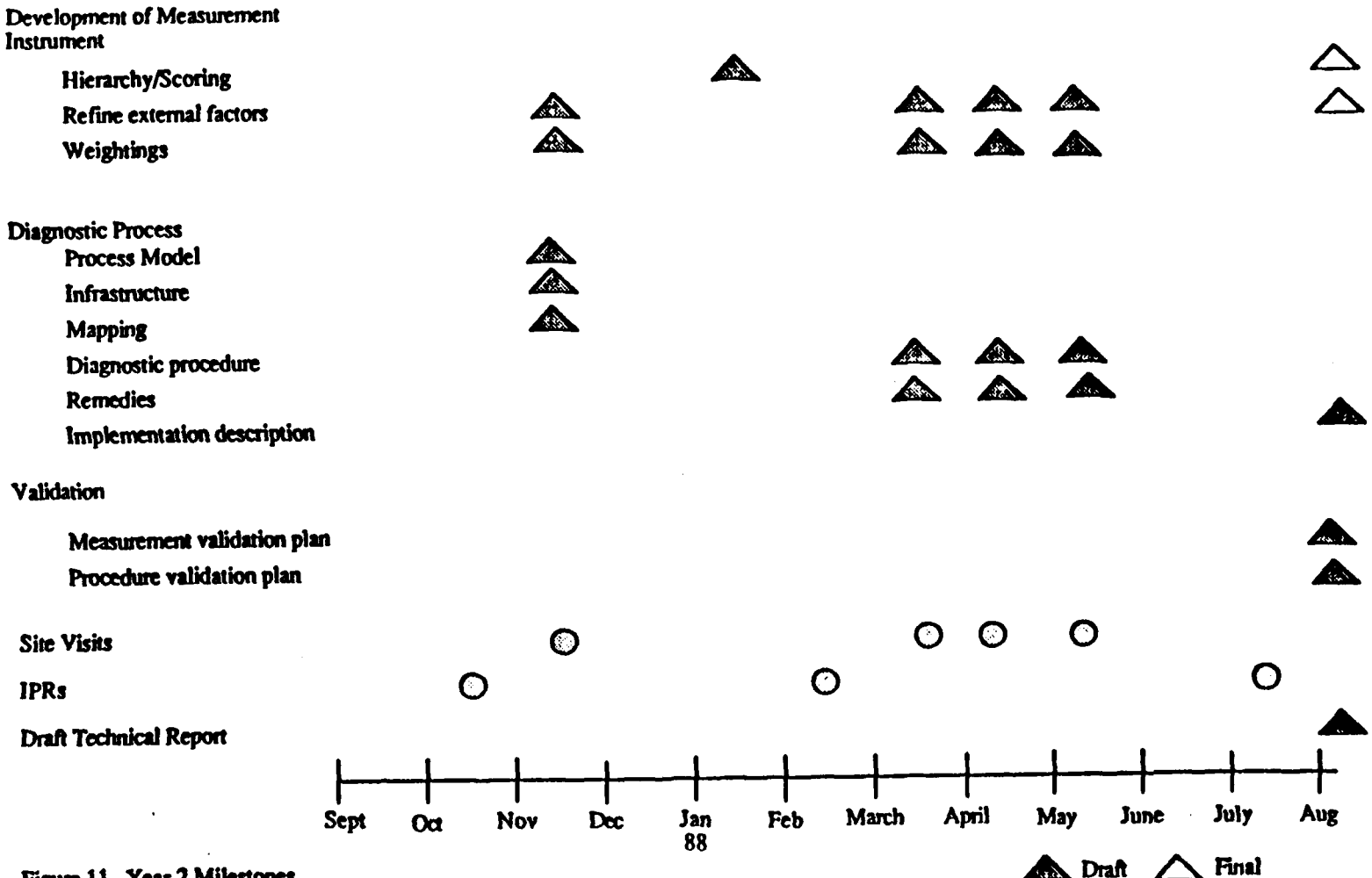

Figure 11. Year 2 Milestones.

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Appendix A

INTERVIEW PROTOCOL

INTRODUCTION

We are conducting a study into the usefulness of military intelligence outputs. The study is aimed at finding out how to make sure command staff personnel get the most useful information possible. The ultimate impact of this research will be directed toward increasing the utility of intelligence you receive. What we need to learn from you is how and when information needs differ.

During this interview, we'll ask you to think about two different scenarios. In each scenario, we'll ask you what information is most important, what makes good intelligence, and how intelligence can be made more useful to you.

We prefer to keep the contents of this interview unclassified. If you don't mind, we would like to tape-record the interview for our own use. Of course, anything you say here is confidential. No results of this interview will be used in any way that could identify you.

BACKGROUND

1. Before we begin, could you please give us a brief description of the types of division (or corps) related experience you have had?

2. What are (were) your primary and alternate specialties?

SCENARIO 1

Let's begin by setting the scenario. Imagine you are a [Cmdr, G-3, G-3 Ops, or G-3 Plans] in a division in Central Europe in a peacetime situation. Since our focus is on information needs, let's consider your day-to-day job as a context. Would you characterize the potential threat you face as high-intensity conflict?

[If the answer is no, ask: Would you be involved in contingency operations involving anti-terrorism?]

To further specify information needs, let's consider a specific task that you perform as part of your job. We would like to select a task in which you use intelligence information in the performance of the task. Doctrine describes a large number of tasks performed by the G-3. We would like you to focus on the task maintaining a current operation estimate of the situation.

Do (or Have) you have/had experience performing this task?

[If no: Do (or Have) you have/had experience with:

- o preparing and publishing operations plans
- o preparing and publishing frag orders
- o recommending prioroties for allocating resources of the command.]

[If no: Can you think of another task that you have experience with that relies on intelligence? What is the task?]

Do you feel comfortable with this scenario?

[If no on a specific aspect, e.g., definition of the mission: Within the general scenario outlined, what do you think is the most likely (mission)?]

1. With this context in mind, how often do you (or have you) perform(ed) this task?

2. What are the first things you want to know from intelligence?

- o PROBE: What do you need to know next?

[Clarify and/or restate their answers at this point.]

- o PROBE: What do you need to know about .....?

[If they respond METT-T, PROBE: is the minimum information about the (mission or enemy or terrain or troops or time available) that you need to know?]

3. What factors are most important in making good MI intelligence information?

- PROBE: Any other factors?

[Clarify and/or restate the answers]

[PROBE for more detail regarding the general factors provided:

- How do you determine reliability?
- What do you mean by accuracy?
- What do you mean by timeliness?
- What would you tolerate in accuracy reduction in order to get more timely information?]

4. In specific, what can be done to improve the usefulness of intelligence that you receive?

- PROBE: Are there any other things that can be done to improve the usefulness?

[Clarify and/or restate the answers.]

SCENARIO 2

Now let's continue talking about the same situation, but change the context. You are in the same position, same unit, (same place), with the same task, but rather than day-to-day operations in a peacetime situation, imagine that you are in [high-intensity/terrorist hostilities or pre-hostilities]. [By pre-hostility we mean that the command has been placed in an advanced state of readiness or placed on alert. In other words, DEFCON status has been changed from DEFCON 5 to DEFCON 4.] We would like to know how your intelligence needs would change.

1. Does the frequency of performing the task change in this context?

2. In day-to-day operations, you said that you wanted ....., first, ... information next, ... [Fill in the blanks with his responses to the first scenario].

   Does the information you need first from intelligence differ in this context over day-to-day operations?

   - PROBE: Any other changes?

   - [If they say nothing will change PROBE: You're saying that you still need ..... first and then .....]

3. Are different factors important in making good intelligence information? [Review factors identified in Scenario 1 if necessary.]

- PROBE: Any other changes in the factors?

- [If they say nothing will change PROBE: You 're saying that ..... are still the most important factors in a pre-hostility environment?]

4. Would you do anything differently to improve the usefulness of intelligence that you receive? [Review responses to Scenario 1 if necessary.]

- PROBE: Would you do anything else differently?

OPTIONAL QUESTION:

What makes a good G-2? What are the attributes of a good G-2?

END OF INTERVIEWS

PHASE II
INTERVIEW PROTOCOL

INTRODUCTION

We are conducting a study into the usefulness of military intelligence outputs. The ultimate impact of this research will be directed toward increasing the utility of intelligence users receive. This interview is part of the second phase in a series of interviews aimed at uncovering what makes intelligence outputs useful to command staff personnel. In the first phase, we tried to determine how and when information needs differ. In this phase, we want to further define what makes useful intelligence.

We would like to keep the contents of this interview unclassified. If you don't mind, we would also like to tape-record the interview for our own use. Of course, anything you say here is confidential. No results of this interview will be used in any way that could identify you.

BACKGROUND

1. Before we begin, I'd like to go over your related experience again. You were a(n) __(POSITION)__ at the __(UNIT)__ level. At that time you were a __(RANK)__.

2. Your primary and alternate specialties were _____ and _____, respectively.

CONTEXT A

As indicated in the handout you received ahead of time, we identified several factors in previous interviews that are important in making good intelligence information. While we received sufficient clarification on some of the factors, several of the factors are still somewhat unclear. In this interview, we'd like to obtain further clarification on these factors from you.

We'd like to discuss these factors in a general scenario. Imagine you are a [Cmdr, G-3, G-S Ops, or G-3 Plans] in a division in Central Europe (high-intensity conflict threat). You are in a peacetime situation. Do you feel comfortable with this scenario?

With this context in mind, let's discuss some of the factors identified.

1. In the earlier interviews, clarity was a factor identified as important in making good intelligence information. What do you mean by clarity?

   - easily understood by user
   - in operational terms

2. Another factor identified as important for good intelligence was accuracy or credibility. What do you mean by accuracy?

   - likelihood of information being true

How is accuracy determined?

- information that is confirmed by multiple sources

Timeliness was identified as extremely important for good intelligence. If you had to choose between timeliness and accuracy which would you choose?

3. A third important factor identified was reliability. What do you mean by reliability.

   - reliable information is information that can be trusted

How do you determine reliability?

- source of intelligence
- prevous experience with source of intelligence

4. The earlier interviews indicated that good intelligence information is filtered or processed. What do you mean by filtered/processed information?

   - screening information
   - summarizing information

If information should be screened, what should be screened out?

- information not relevant to the unit's objective(s)

5. The earlier interviews also indicated that it is important for the information to be interpreted. What do you mean by information that is interpreted?

   - assessed for its impact
   - conclusions drawn

6. A final factor identified in the earlier interviews as important in making good intelligence information is relevance. What do you mean by relevance? Relevant to what?

   - related to unit's mission/objective

7. [Discuss/clarify factors added to the list in Section 1 of the handout given prior to the interview.] What do you mean by _____?

CONTEXT B

Now let's continue talking about the same situation, but change one thing. Rather than a peacetime situation, imagine that you are in high-intensity hostilities. We would like to know how your intelligence needs would change.

1. Let's look at Section 3 of the handout and see if any of the factors change in importance in this context.

   [Review Section 3 of the handout. Discuss/clarify any factors that changed in importance from peacetime to active hostilities.]

2. Are different factors important in making good intelligence information? Any other changes in the factors.

3. [Review Section 2 of the handout. Discuss/clarify any changes from peacetime to active hostilities.]

MILITARY INTELLIGENCE UNIT PERFORMANCE PROJECT
READ-AHEAD PACKAGE FOR PHASE II INTERVIEWS

SECTION 1

The following list contains factors identified in previous interviews as important in making good intelligence information. Each factor is followed by a definition based on the first round of interviews. In order to verify that these factors were defined correctly and are indeed important in making good intelligence information, we would like you to review this list. Please expand, clarify, or correct these definitions as you deem appropriate. If you would like to add any factors please do so in the spaces provided at the end of the list. We will go over your comments more extensively in the upcoming interview.

1. Timeliness - does the information get to the user in time; timely information is information that the user receives in time to allow an appropriate response.

2. Currency - age or perishability of the information; current information is information that still accurately represents the present situation.

3. Completeness - specificity; how specific or detailed the information is; information with the sufficient level of detail.

4. Conciseness - succinctness; without unnecessary detail; concise information is succinct and to the point.

5. Clarity - information is in terms (i.e., operational or tactical terms) easily understood by the user.

6. Graphical - information is presented in graphic form to the extent possible.

7. Accuracy - the information presented is factually correct.

8. Credibility - the extent to which information is confirmed; the probability that the information is true.

9. Source Reliability - information is from sources that can be trusted; reliability is based on the source of the intelligence and previous experience with the source.

10. Filtered/Processed - information that has been screened or summarized.

11. Interpreted - information is assessed in terms of its impact; information for which conclusions are drawn concerning its impact.

12. Relevance - information that is explicitly related or pertinent to the unit's mission/objective.

13. _____

14. _____

15. _____

SECTION 2

The following items were identified in previous interviews as the type of information needed first from intelligence. Please review this list of information types and add, delete, modify, or annotate the items based on your experience as a user of intelligence. Additionally, for each item check the box that best indicates how important you feel this type of information is in peacetime situation. (Please check one box per item.)

Part A - Peacetime

	Not Important At All			Moderately Important			Extremely Important
1. Enemy Capabilities:	[1]	[2]	[3]	[4]	[5]	[6]	[7]
a. Unit type	[1]	[2]	[3]	[4]	[5]	[6]	[7]
b. Size	[1]	[2]	[3]	[4]	[5]	[6]	[7]
c. Reinforcements	[1]	[2]	[3]	[4]	[5]	[6]	[7]
d. Intelligence efforts	[1]	[2]	[3]	[4]	[5]	[6]	[7]
e. Leadership	[1]	[2]	[3]	[4]	[5]	[6]	[7]
f. Morale	[1]	[2]	[3]	[4]	[5]	[6]	[7]
g. Weaknesses/vulnerabilities	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. Location of Enemy	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. Enemy Movement/Activity	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. Enemy Order of Battle	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. Changes in Enemy Posture	[1]	[2]	[3]	[4]	[5]	[6]	[7]
6. Political Climate	[1]	[2]	[3]	[4]	[5]	[6]	[7]
7. Terrain	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. Weather	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]

Part B - Active Hostilities

This section asks how important you think the information types are in hostilities. For each item check the box that best indicates how important you feel this type of information is in active hostilities. (Please check one box per item.)

	Not Important At All					Moderately Important	Extremely Important
1. Enemy Capabilities:	[1]	[2]	[3]	[4]	[5]	[6]	[7]
a. Unit type	[1]	[2]	[3]	[4]	[5]	[6]	[7]
b. Size	[1]	[2]	[3]	[4]	[5]	[6]	[7]
c. Reinforcements	[1]	[2]	[3]	[4]	[5]	[6]	[7]
d. Intelligence efforts	[1]	[2]	[3]	[4]	[5]	[6]	[7]
e. Leadership	[1]	[2]	[3]	[4]	[5]	[6]	[7]
f. Morale	[1]	[2]	[3]	[4]	[5]	[6]	[7]
g. Weaknesses/vulnerabilities	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. Location of Enemy	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. Enemy Movement/Activity	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. Enemy Order of Battle	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. Changes in Enemy Posture	[1]	[2]	[3]	[4]	[5]	[6]	[7]
6. Political Climate	[1]	[2]	[3]	[4]	[5]	[6]	[7]
7. Terrain	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. Weather	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]

SECTION 3

This section asks how important you think the previously identified factors are in making good intelligence information in peacetime. For each item, check the box that best indicates how important you feel the factor is in a peacetime situation. (Please check one box per item.)

Part A - Peacetime

	Not Important At All			Moderately Important			Extremely Important
1. Timeliness	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2. Currency	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3. Completeness	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4. Conciseness	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5. Clarity	[1]	[2]	[3]	[4]	[5]	[6]	[7]
6. Graphical	[1]	[2]	[3]	[4]	[5]	[6]	[7]
7. Accuracy	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8. Credibility	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9. Reliability	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10. Filtered/Processed	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11. Interpreted	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12. Relevance	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15. _____	[1]	[2]	[3]	[4]	[5]	[6]	[7]

Part B - Active Hostilities

This section asks how important you think various factors are in making good intelligence information in hostilities. For each item check the box that best indicates how important you feel the factor is in active hostilities. (Please check one box per item.)

		Not Important At All						Extremely Important
				Moderately Important				
1.	Timeliness	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2.	Currency	[1]	[2]	[3]	[4]	[5]	[6]	[7]
3.	Completeness	[1]	[2]	[3]	[4]	[5]	[6]	[7]
4.	Conciseness	[1]	[2]	[3]	[4]	[5]	[6]	[7]
5.	Clarity	[1]	[2]	[3]	[4]	[5]	[6]	[7]
6.	Graphical	[1]	[2]	[3]	[4]	[5]	[6]	[7]
7.	Accuracy	[1]	[2]	[3]	[4]	[5]	[6]	[7]
8.	Credibility	[1]	[2]	[3]	[4]	[5]	[6]	[7]
9.	Reliability	[1]	[2]	[3]	[4]	[5]	[6]	[7]
10.	Filtered/Processed	[1]	[2]	[3]	[4]	[5]	[6]	[7]
11.	Interpreted	[1]	[2]	[3]	[4]	[5]	[6]	[7]
12.	Relevance	[1]	[2]	[3]	[4]	[5]	[6]	[7]
13.	_____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
14.	_____	[1]	[2]	[3]	[4]	[5]	[6]	[7]
15.	_____	[1]	[2]	[3]	[4]	[5]	[6]	[7]

Appendix B

Decision Conference Read-Ahead Package

EXTERNAL FACTORS

Our study is focusing on the utility of outputs from military intelligence. By outputs, we mean anything that operations receives from intelligence, including formal reports, briefings, informal conversations, etc.

Based on our initial research, we have concluded that the specific utility assigned to the information contained in a particular intelligence output is influenced somewhat by the situational context. For that reason, we are concerned with determining what factors define the context for the individual judging the utility/relevance of information contained in an output.

Six external (i.e., situational) factors have been identified from our research. We would like your opinion at the working session as to whether or not the list of factors and levels is complete. After you have reviewed all the factors, please consider whether or not you think there are additional factors that we have overlooked. If there are additional external factors that impact on the assessment of intelligence output utility please point these factors out at the working session.

External Factor 1: Level of Conflict

Level of conflict of the situation in which the individual is assessing utility.

Levels of this factor include:

Peace/Noncombat
Terrorism
Contingency Operations
Low-Intensity Conflict
Mid-Intensity Conflict
High-Intensity Conflict

1. Do you think that level of conflict may affect the utility/value/relevance assessment of information contained in an intelligence output?

2. If yes to question 1, do you think that the level of conflict factor is adequately described by the levels as stated? Are any of the levels unnecessary? Should additional levels be added? Should some levels be combined? Please offer specific suggestions for modifications.

External Factor 2: User

Staff position of the individual making the utility assessment of an intelligence output.

Levels of this factor include:

G1
G2
G3
G4
G5
CDR
FSC
Chemical Officer
Intrastaff (G3Plans, G3Ops)

1. Do you think that user role has an impact on the assessment of the utility/value/relevance of information contained in an intelligence output?

2. If yes, should additional users be included? (EWO, other echelons above, below, adjacent)

External Factor 3: User Echelon

Echelon of the individual making the utility assessment.

Levels of Factor:

National
U & S Command
Theater
Corps
Division
BDE
BN

1. Do you think that a user's echelon impacts the utility/value/relevance assessment of information contained in an intelligence output?

2. If yes to question 1, are all the levels of the factor necessary? If no, are more needed or fewer? Please offer specific suggestions for modifications.

External Factor 4: Operational State

Operational state is defined as conditions of readiness or action.

Levels of Factor:

Status Quo (continuation of routine activities)
Pre-Hostility (Defcon 2 or lower)
Hostility (Defcon 1 or combat)
Post-Hostility (activities associated with post-combat, battle, campaign, or contingency operations)

1. Do you think that operational states impact the assessment of utility/value/relevance of information contained in an intelligence output?

2. If yes to question 1, are all the levels of the factor necessary? If no, are more needed or fewer? Please offer specific suggestions for modifications.

External Factor 5: Functional Application

Functional application governs the way the information content of an intelligence output will be applied by the user.

Levels of Factor:

Data Base/Record Keeping. The maintenance of files and development of historical information from which comparative analysis is undertaken.
Protection/Security. Those passive and active measures undertaken to provide operational security.
Planning. All activities necessary for operations preparation for the accomplishment of mission related to maneuver, fires, combat support, and combat service support.
Execution. All activities necessary for accomplishing the mission related to maneuver, fires, combat support, and combat service support.

1. Do you think that functional application impacts the assessment of utility/value/relevance of information contained in an intelligence output?

2. If yes, are all of the identified factor levels necessary? If no, are more needed or fewer? Please offer specific suggestions for modifications.

External Factor 6: Mission

Mission refers to the mission of the user's unit.

Levels of Factor

Offensive
Defensive
Retrograde
Special Operations
Contingency Operations
Joint and Combined Operations

1. Do you think that mission impacts the assessment of utility/value/relevance of information contained in an intelligence output?

2. If yes, are the identified levels adequate? If no, are more needed or fewer? Please offer specific suggestions for modifications.

MEASUREMENT OF INFORMATION VALUE/RELEVANCE

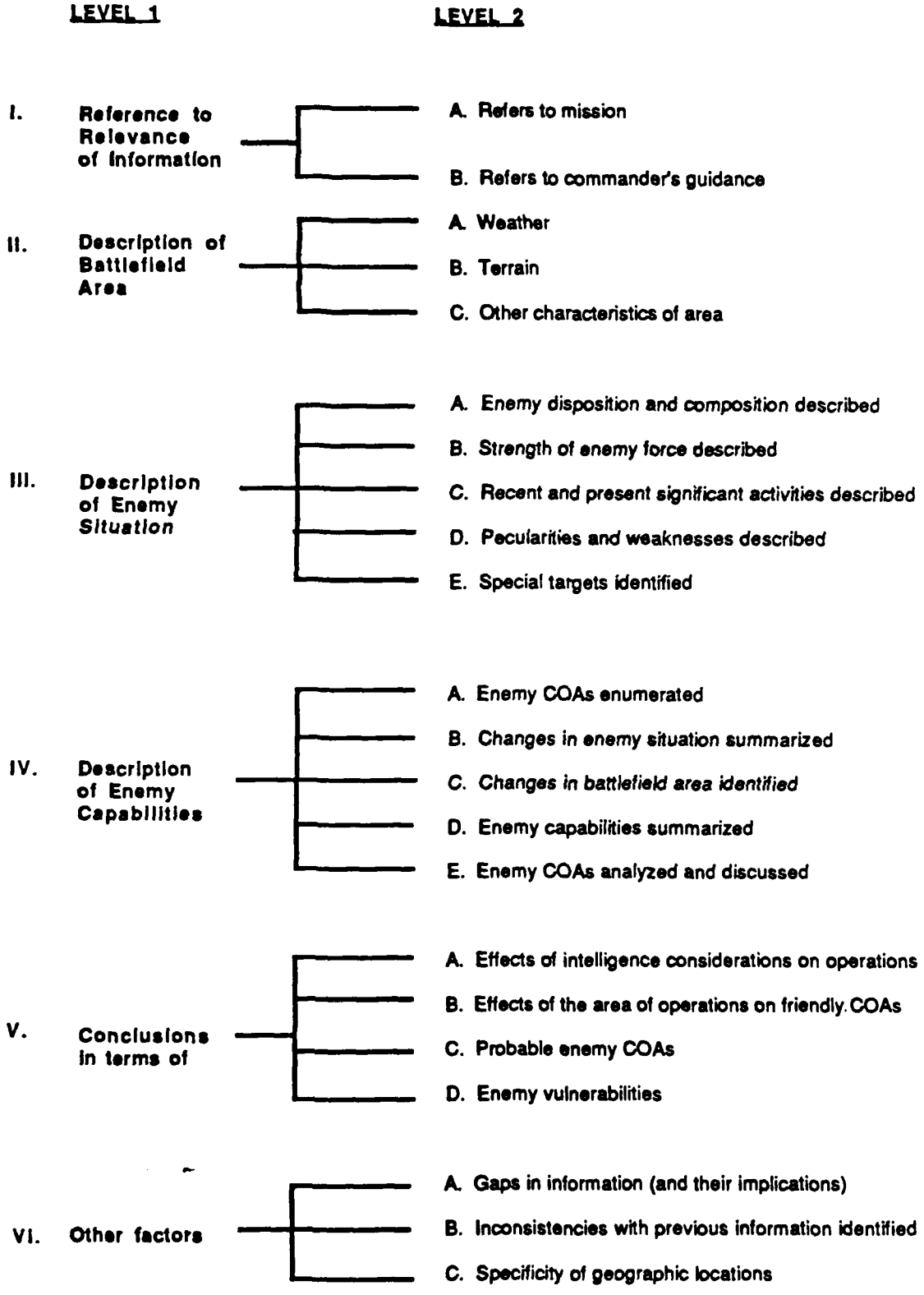
The current focus of our investigation into the utility of intelligence output is concerned with the value/relevance of information contained in a military intelligence output. We have extracted (from numerous sources) a large number of information items. These information items have been organized into a hierarchical structure. We would like you to review both the information items and the manner in which they have been organized and answer the following questions:

> Are there information items missing which should be included? If so, please specify the items to be added.
>
> Is the organization of the information items adequate? If not, how should the information be organized?

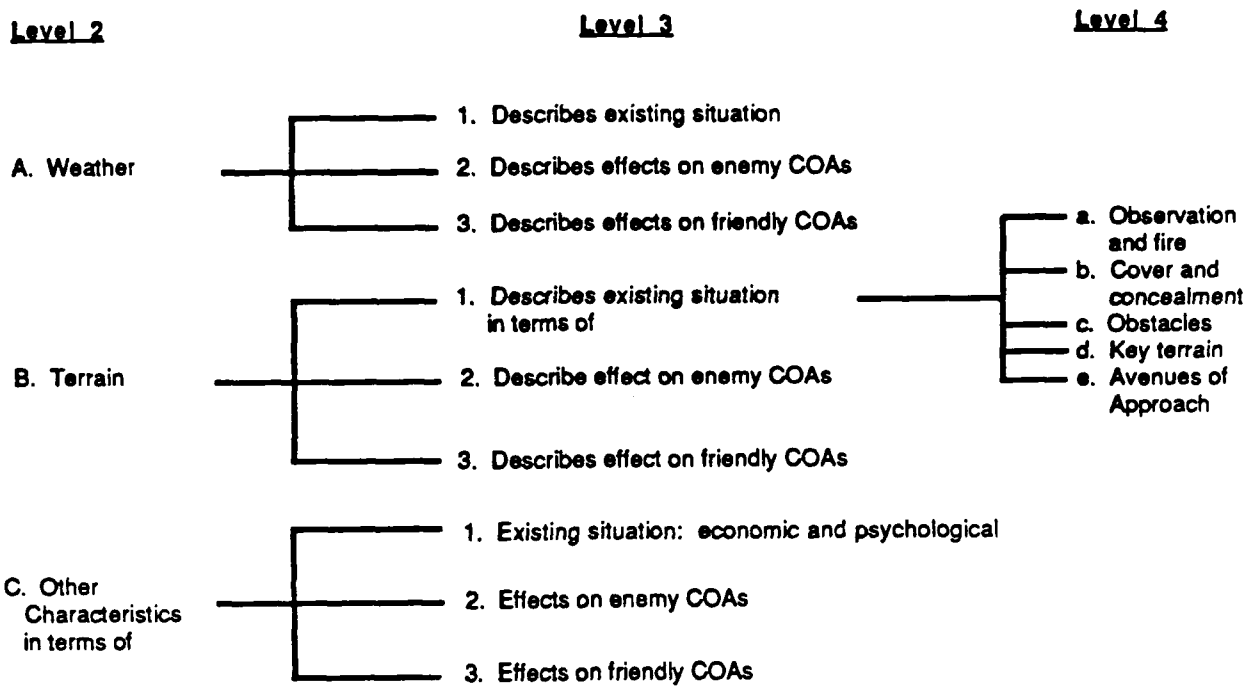
During the working session we would like to obtain consensus on the following: (a) information items, (b) organization of the information items, and (c) external factors needed to define situational context. Once consensus has been obtained, we will ask you to weight the information items in order to obtain importance weights that indicate the relative value of different types of information for different users under different situational contexts.

We have provided two different portrayals of the information item organization for your convenience. While both portrayals contain the same information, one is diagrammed in a tree-like structure, the other is in outline form. The tree-like structure of the information organization provides an overview of the two highest levels with the lower levels of detail provided on subsequent pages. The outline form, on the other hand, steps completely through the organization proceeding from the highest level through its related detail before moving to the next highest level. You may use either or both portrayal whichever is more convenient for you.

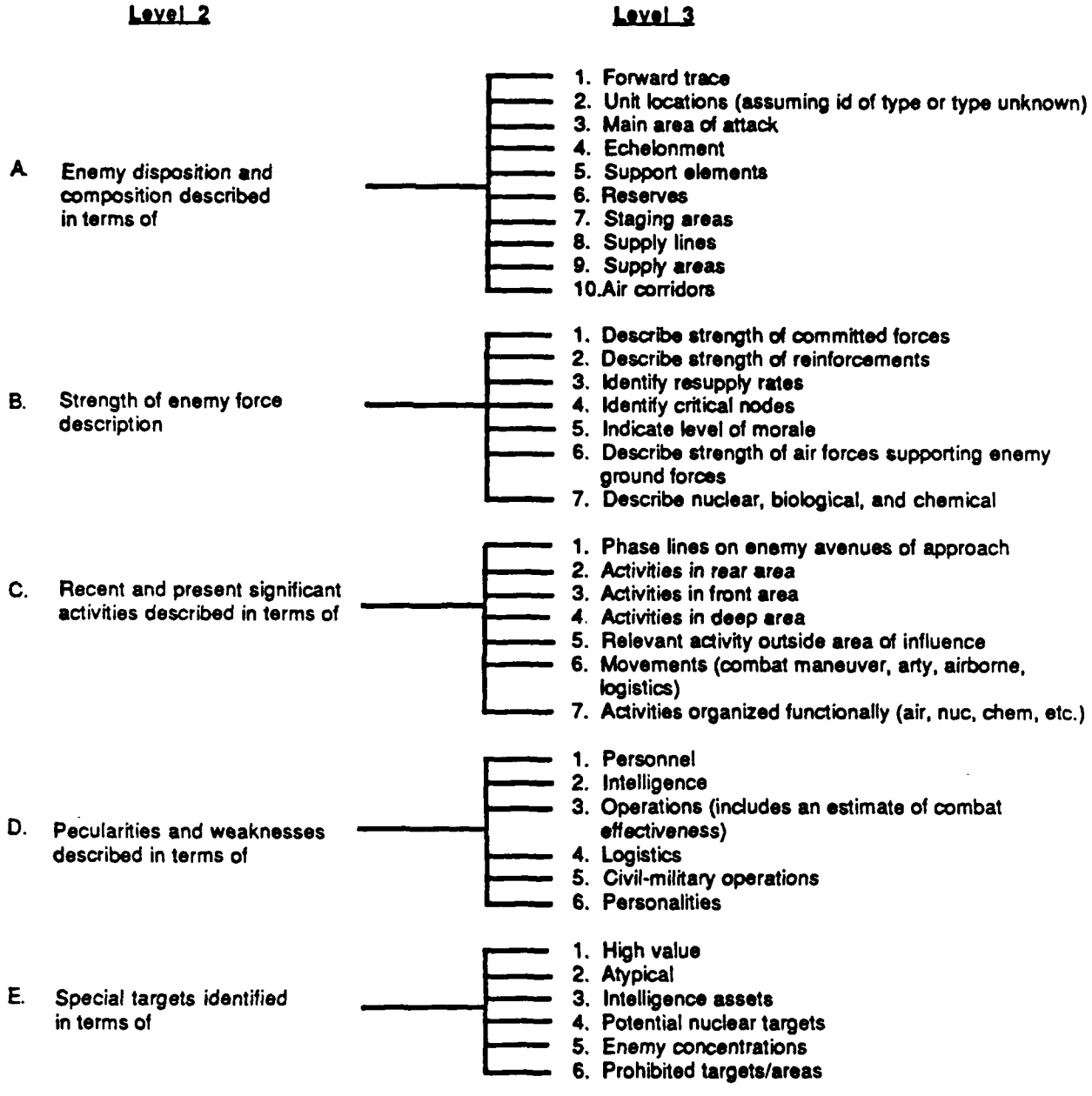
Strawman Factors for Measuring Information Value/Relevance of MI Output



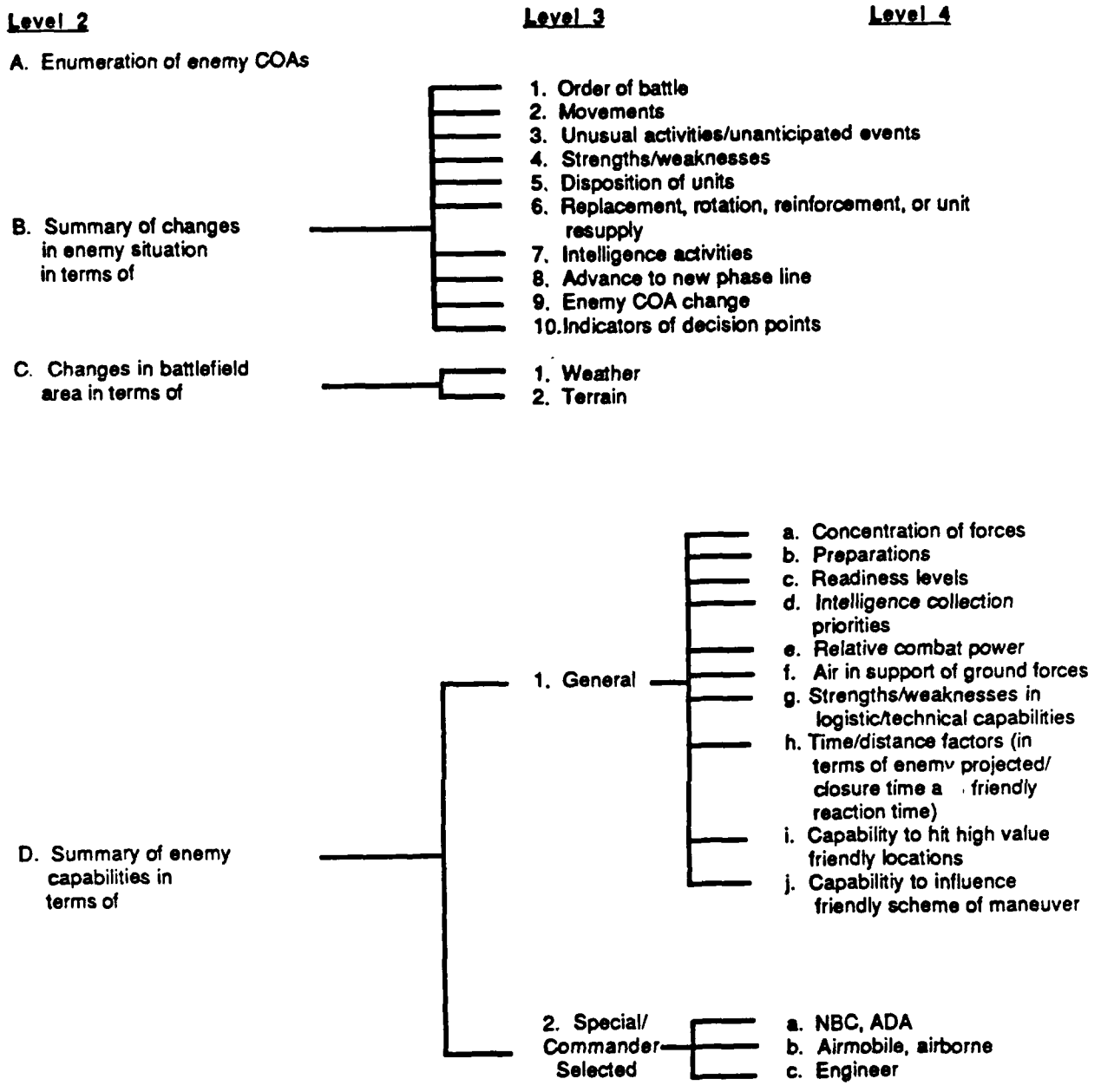
Level 1: II. Description of Battlefield Area



Level 1: III. Description of Enemy Situation



Level 1: IV. Description of Enemy Capabilities



Level 1: V. Conclusions In Terms of

Level 2	Level 3
A. Effects of intelligence considerations on operations	
B. Effects of the area of operations on friendly COAs	
C. Probable enemy COAs in terms of	1. Concentration of forces 2. Location of main attack 3. Type of units and strength
D. Enemy vulnerabilities	

Appendix C

Military Intelligence Product Survey

Purpose: The purpose of this survey is to obtain the opinion of operational personnel with regard to the utility of military intelligence products. The enclosed forms will ask you about your familiarity with various products and how frequently you use the products. In addition, you will be asked your opinion about product adequacy and possible ways to improve the products. Brief instructions are contained at the top of each survey form; please read these before completing each form.

About the Survey: By intelligence product we are referring to outputs of military intelligence; included in the list of products are those you would receive in written form as well as briefings, including formal (e.g., commander's evening brief) and informal (e.g., conversations). The list of intelligence products contains products specified by intelligence doctrine (e.g., INTSUM) as well as intelligence outputs that are not formally recognized as products. The list contains some outputs of the IPB process (e.g., named areas of interest) and intelligence products that direct the intelligence collection effort (e.g., collection priorities). The list of intelligence products does not contain all possible intelligence products; for this reason spaces are provided on the survey forms for you to add intelligence products that you believe should be included in the list.

Your responses on these forms will remain strictly confidential. We greatly appreciate your cooperation in this study. If you are interested in obtaining a summary of the study findings, please give your name and mailing address to one of the interviewers.

Demographic Information: Please complete the following.

Rank _____

Primary Specialty _____

Alternate Specialty _____

Have you served on an intelligence staff or in an operational intelligence unit in the past five years? YES_____ NO_____

Please identify your division level operational staff experience.

_____

_____

_____

_____

PAGE 2: INTELLIGENCE PRODUCT FAMILIARITY

INSTRUCTIONS: This form is concerned with determining how well acquainted you are with various intelligence products. For each product, please check the box that best indicates the extent of your familiarity with a particular product. For example, if you have never heard of an INTSUM, you would check box #1 on the line corresponding to an INTSUM; if you have extensive knowledge of an INTSUM you would check box #5, and so on. You may add products in the spaces provided at the end of the list. Please check only one box per product.

INTELLIGENCE PRODUCT	NOT AT ALL FAMILIAR WITH IT	SLIGHTLY FAMILIAR WITH IT	MODERATELY FAMILIAR WITH IT	VERY FAMILIAR WITH IT	EXTREMELY FAMILIAR WITH IT
Intelligence Summary (INTSUM)	[1]	[2]	[3]	[4]	[5]
Periodic Intelligence Report (PERINTREP)	[1]	[2]	[3]	[4]	[5]
Supplementary Intelligence Report (SUPINTREP)	[1]	[2]	[3]	[4]	[5]
Intelligence Annex	[1]	[2]	[3]	[4]	[5]
Intelligence Estimate	[1]	[2]	[3]	[4]	[5]
Intelligence Report (INTREP)	[1]	[2]	[3]	[4]	[5]
Situation Report	[1]	[2]	[3]	[4]	[5]
Imagery Reports (such as RECCEEXREP, IPIR, SUPIR)	[1]	[2]	[3]	[4]	[5]
Spot Report	[1]	[2]	[3]	[4]	[5]
Responses to Information Requests	[1]	[2]	[3]	[4]	[5]
Formal Briefing	[1]	[2]	[3]	[4]	[5]
Informal Briefing	[1]	[2]	[3]	[4]	[5]
Collection Priorities	[1]	[2]	[3]	[4]	[5]
Named Areas of Interest (NAIs)	[1]	[2]	[3]	[4]	[5]
Target Areas of Interest (TAIs)	[1]	[2]	[3]	[4]	[5]
Target List	[1]	[2]	[3]	[4]	[5]
Target Nomination	[1]	[2]	[3]	[4]	[5]
Target Priority List	[1]	[2]	[3]	[4]	[5]
Other Products (please list)					
_____	[1]	[2]	[3]	[4]	[5]
_____	[1]	[2]	[3]	[4]	[5]
_____	[1]	[2]	[3]	[4]	[5]

PAGE 3: FREQUENCY OF INTELLIGENCE PRODUCT USE

INSTRUCTIONS: This form is concerned with determining what you do with various intelligence products when you receive them. You may add products in the spaces provided at the end of the list. Check as many boxes as you need to describe how frequently you use each product.

INTELLIGENCE PRODUCT	DON'T USE PRODUCT	FILE PRODUCT FOR LATER USE	USE PRODUCT ONCE	USE PRODUCT REPEATEDLY	USE PRODUCT RIGHT AWAY
Intelligence Summary (INTSUM)	[ ]	[ ]	[ ]	[ ]	[ ]
Periodic Intelligence Report (PERINTREP)	[ ]	[ ]	[ ]	[ ]	[ ]
Supplementary Intelligence Report (SUPINTREP)	[ ]	[ ]	[ ]	[ ]	[ ]
Intelligence Annex	[ ]	[ ]	[ ]	[ ]	[ ]
Intelligence Estimate	[ ]	[ ]	[ ]	[ ]	[ ]
Intelligence Report (INTREP)	[ ]	[ ]	[ ]	[ ]	[ ]
Situation Report	[ ]	[ ]	[ ]	[ ]	[ ]
Imagery Reports (such as RECCEEXREP, IPIR, SUPIR)	[ ]	[ ]	[ ]	[ ]	[ ]
Spot Report	[ ]	[ ]	[ ]	[ ]	[ ]
Responses to Information Requests	[ ]	[ ]	[ ]	[ ]	[ ]
Formal Briefings	[ ]	[ ]	[ ]	[ ]	[ ]
Informal Briefings	[ ]	[ ]	[ ]	[ ]	[ ]
Collection Priorities	[ ]	[ ]	[ ]	[ ]	[ ]
Named Areas of Interest (NAIs)	[ ]	[ ]	[ ]	[ ]	[ ]
Target Areas of Interest (TAIs)	[ ]	[ ]	[ ]	[ ]	[ ]
Target List	[ ]	[ ]	[ ]	[ ]	[ ]
Target Nomination	[ ]	[ ]	[ ]	[ ]	[ ]
Target Priority List	[ ]	[ ]	[ ]	[ ]	[ ]
Other Products (please list)					
_____	[ ]	[ ]	[ ]	[ ]	[ ]
_____	[ ]	[ ]	[ ]	[ ]	[ ]
_____	[ ]	[ ]	[ ]	[ ]	[ ]

PAGE 4: INTELLIGENCE PRODUCT USEFULNESS

INSTRUCTIONS: This form asks for your opinion about the usefulness of various intelligence products. From your experience, we would like your opinion about how well each intelligence product listed fits your requirements or is sufficient to meet your intelligence needs. Please indicate the usefulness of each product by checking the box that corresponds to your opinion about the product. Please select only one box per product. You may add to this list of products in the space provided at the end of the list. If you add products, please indicate your opinion about the usefulness of them. If there are products in this list that you have never used, please do not rate their usefulness, leave the corresponding line blank.

INTELLIGENCE PRODUCT	NOT USEFUL	SLIGHTLY USEFUL	MODERATELY USEFUL	VERY USEFUL	EXTREMELY USEFUL
Intelligence Summary (INTSUM)	[1]	[2]	[3]	[4]	[5]
Periodic Intelligence Report (PERINTREP)	[1]	[2]	[3]	[4]	[5]
Supplementary Intelligence Report (SUPINTREP)	[1]	[2]	[3]	[4]	[5]
Intelligence Annex	[1]	[2]	[3]	[4]	[5]
Intelligence Estimate	[1]	[2]	[3]	[4]	[5]
Intelligence Report (INTREP)	[1]	[2]	[3]	[4]	[5]
Situation Report	[1]	[2]	[3]	[4]	[5]
Imagery Reports (such as RECCEEXREP, IPIR, SUPIR)	[1]	[2]	[3]	[4]	[5]
Spot Report	[1]	[2]	[3]	[4]	[5]
Responses to Information Requests	[1]	[2]	[3]	[4]	[5]
Formal Briefings	[1]	[2]	[3]	[4]	[5]
Informal Briefings	[1]	[2]	[3]	[4]	[5]
Collection Priorities	[1]	[2]	[3]	[4]	[5]
Named Areas of Interest (NAIs)	[1]	[2]	[3]	[4]	[5]
Target Areas of Interest (TAIs)	[1]	[2]	[3]	[4]	[5]
Target List	[1]	[2]	[3]	[4]	[5]
Target Nomination	[1]	[2]	[3]	[4]	[5]
Target Priority List	[1]	[2]	[3]	[4]	[5]
Other Products (please list)					
_____	[1]	[2]	[3]	[4]	[5]
_____	[1]	[2]	[3]	[4]	[5]
_____	[1]	[2]	[3]	[4]	[5]

PAGE 5: INTELLIGENCE PRODUCT REASON FOR USE

INSTRUCTIONS: This form asks you to characterize the reason(s) why you find a particular intelligence product to be useful. If you gave a product a usefulness rating other than not useful, please characterize the reason for your usefulness rating below. You may check as many boxes as needed to describe why a product is useful to you. You may add products in the spaces provided. If you add products please indicate your reason(s) for using the products. Please do not rate any products you rated as not useful.

INTELLIGENCE PRODUCT	ONLY SOURCE AVAILABLE	BEST SOURCE AVAILABLE	EASY TO USE	MOST TIMELY INFORMATION	OTHER (specify)
Intelligence Summary (INTSUM)	[ ]	[ ]	[ ]	[ ]	_____
Periodic Intelligence Report (PERINTREP)	[ ]	[ ]	[ ]	[ ]	_____
Supplementary Intelligence Report (SUPINTREP)	[ ]	[ ]	[ ]	[ ]	_____
Intelligence Annex	[ ]	[ ]	[ ]	[ ]	_____
Intelligence Estimate	[ ]	[ ]	[ ]	[ ]	_____
Intelligence Report (INTREP)	[ ]	[ ]	[ ]	[ ]	_____
Situation Report	[ ]	[ ]	[ ]	[ ]	_____
Imagery Reports (such as RECCEEXREP, IPIR, SUPIR)	[ ]	[ ]	[ ]	[ ]	_____
Spot Report	[ ]	[ ]	[ ]	[ ]	_____
Responses to Information Requests	[ ]	[ ]	[ ]	[ ]	_____
Formal Briefings	[ ]	[ ]	[ ]	[ ]	_____
Informal Briefings	[ ]	[ ]	[ ]	[ ]	_____
Collection Priorities	[ ]	[ ]	[ ]	[ ]	_____
Named Areas of Interest (NAIs)	[ ]	[ ]	[ ]	[ ]	_____
Target Areas of Interest (TAIs)	[ ]	[ ]	[ ]	[ ]	_____
Target List	[ ]	[ ]	[ ]	[ ]	_____
Target Nomination	[ ]	[ ]	[ ]	[ ]	_____
Target Priority List	[ ]	[ ]	[ ]	[ ]	_____
Other Products (please list)					
_____	[ ]	[ ]	[ ]	[ ]	_____
_____	[ ]	[ ]	[ ]	[ ]	_____
_____	[ ]	[ ]	[ ]	[ ]	_____

PAGE 6: RECOMMENDED MODIFICATIONS TO INTELLIGENCE PRODUCTS

INSTRUCTIONS: This form is provided for you to list specific recommendations concerning ways to improve products. Please list the product in the space provided and your recommended modifications in the adjacent space.

INTELLIGENCE PRODUCT	RECOMMENDED MODIFICATIONS

1. In answering the preceding questions about intelligence products, did you think of experiences you had in a specific command or unit assignment. If yes, please specify the command or unit assignment and its location.

2. When making your responses to the questions about intelligence products, did you make any assumptions about the accuracy or timeliness of the intelligence, or the credibility of the analyst, etc.? If so, please explain.

3. Are there any questions that you feel should have been asked that were not asked? If so, what?

4. Since this study is focusing on the operational perspective of military intelligence products, is there anything you would like to point out to the researchers?

(If you require additional space in answering the questions below, please continue answers on the back of this page.)

Appendix D

Information Types

Importance in Peacetime and Active Hostilities

Information Types	Peacetime		Active Hostilities	
	Mean	Standard Deviation	Mean	Standard Deviation
Enemy Capabilities	5.75	0.95	7.00	0
Unit Type	6.00	1.41	7.00	0
Size	5.75	1.50	7.00	0
Reinforcements	4.75	1.26	6.50	0.58
Intelligence Efforts	4.00	1.83	5.00	2.16
Leadership	4.40	0.89	5.20	0.84
Morale	4.20	1.10	4.80	1.10
Weaknesses/Vulnerabilities	5.20	1.48	6.40	0.89
Location of Enemy	5.20	1.79	6.80	0.45
Enemy Movement/Activity	4.60	2.51	6.80	0.45
Enemy Order of Battle	5.80	1.30	6.80	0.45
Changes in Enemy Posture	5.00	2.70	6.60	0.89
Political Climate	4.50	2.08	3.60	1.30
Terrain	5.60	1.52	6.40	0.89
Weather	5.25	1.5	6.40	0.89

Rating Scale: 1 to 7

1 = Not important at all

4 = Moderately important

7 = Extremely Important

Output Characteristics

Importance in Peacetime and Active Hostilities

Output Characteristics	Peacetime		Active Hostilities	
	Mean	Standard Deviation	Mean	Standard Deviation
Timeliness	5.00	2.12	7.00	0
Currency	5.80	1.30	7.00	0
Completeness	5.75	1.26	5.40	2.50
Conciseness	4.80	0.84	5.40	0.89
Clarity	5.20	1.10	5.60	1.14
Graphical	3.8	0.84	5.00	1.20
Accuracy	6.20	0.84	6.80	0.45
Credibility	5.80	0.84	6.40	0.55
Reliability	5.80	1.50	6.40	0.55
Filtered/Process	5.25	1.50	5.75	0.96
Interpreted	5.00	1.15	5.75	0.50
Relevance	4.80	1.92	5.60	2.07

Rating Scale: 1 to 7

1 = Not important at all

4 = Moderately important

7 = Extremely Important

Appendix E

GLOSSARY OF TERMS

The following definitions are modifications of dictionary definitions. The objective of the modification of the definitions was to capture an operational perspective in the definitions to be used in the MI unit research work.

Accuracy: The condition or quality of representing reality about enemy forces, enemy capabilities, enemy intentions, weather, or terrain. For example, the degree to which something is where it is said to be.

Clear: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is free from obscurity or ambiguity, and is easily understood and unmistakable.

Complete: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which has all the necessary parts or elements, is fully developed and does not carry the implication that something is missing.

Concise: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which covers much in a few words, is succinct and free from elaboration and superfluous detail. See "detail" and "summary" for related concepts.

Conclusion: A reasoned judgment, such as the enemy most likely courses of action, accepted as a possible outcome with regard to enemy forces, enemy capabilities, enemy intentions, weather, or terrain.

Continuity: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which represents a succession of data without essential change. See "gap" for related concept.

Credibility: The demonstrated quality, over time, of presenting finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is accepted by users as being, more often than not, correct.

Detail: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is an extended treatment or exhaustive, thorough and comprehensive, but focused on a specific operational purpose or use. See "concise" and "summary" for related concepts.

Filtered: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which has been pre-screened to remove unnecessary redundancy or spurious facts or data.

Finished Intelligence: The result of evaluation, analysis or fusion of facts or data with new facts or data pertaining to enemy forces, enemy capabilities, enemy intentions, weather, or terrain. See "information" for contrasting concept.

Gap: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which reflects a break in continuity. See "continuity" for related concept.

Graphic: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is portrayed as a picture, map, overlay, chart, table, or graph.

Hypothesis: A proposition or set of propositions, such as potential enemy courses of action, set forth as an explanation or projection of what may occur with regard to enemy forces, enemy capabilities, enemy intentions, weather, or terrain.

Information: Facts or data pertaining to the enemy forces, enemy capabilties, enemy intentions, weather, or terrain. See "finished intelligence" for contrasting concept.

Precise: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather or terrain which is definitely or strictly stated, defined or fixed; minutely exact.

Perishability: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which by its very nature

deteriorates rapidly in terms of permiting reasonable operational response. See "timeliness" for a related concept.

Processed: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which has been synthesized with other information or finished intelligence.

Relevance: The degree to which information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain applies to the mission and area of operations and satisfies the needs of the user.

Reliablity: The quality or state of being dependable in the portrayal of information or finished intelligence about enemy forces, enemy capabililities, enemy intentions, weather, or terrain.

Specific: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is peculiarly adapted to an operational purpose or use, such as planning, targetting, or maneuver.

Summary: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is comprehensive and covers the main points succinctly. See "concise" and "detail" for related concepts.

Timeliness: The availability of information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain in terms of whether or not it permits reasonable operational response. See "perishability" for a related concept.

Unusualness: Information or finished intelligence about enemy forces, enemy capabilities, enemy intentions, weather, or terrain which is uncommon, rare, or unanticipated.

Appendix F

Intelligence Product Familiarity: Operations User Group

Intelligence Product	Mean	Standard Deviation	Minimum	Maximum	Median
Intelligence Summary	4.27	.47	4.0	5.0	4.0
Periodic Intelligence Report	2.91	1.04	2.0	5.0	3.0
Supplementary Intelligence Report	2.27	.90	1.0	3.0	3.0
Intelligence Annex	4.36	.81	3.0	5.0	5.0
Intelligence Estimate	4.45	.69	3.0	5.0	5.0
Intelligence Report	3.55	.93	2.0	5.0	3.0
Situation Report	4.27	.79	3.0	5.0	4.0
Imagery Reports	2.18	.75	1.0	4.0	2.0
Spot Report	4.45	.69	3.0	5.0	5.0
Responses to Information Requests	3.09	1.14	1.0	5.0	3.0
Formal Briefing	4.73	.47	4.0	5.0	5.0
Informal Briefing	4.73	.47	4.0	5.0	5.0
Collection Priorities	4.00	1.10	2.0	5.0	4.0
Named Areas of Interest (NAIs)	4.09	.83	3.0	5.0	4.0
Target Areas of Interest (TAIs)	4.09	.83	3.0	5.0	4.0
Target List	4.36	.81	3.0	5.0	5.0
Target Nomination	4.00	1.0	2.0	5.0	4.0
Target Priority List	4.09	1.04	2.0	5.0	4.0

Intelligence Product Familiarity: Non-Operations User Group

Intelligence Product	Mean	Standard Deviation	Minimum	Maximum	Median
Intelligence Summary	4.25	.45	4.0	5.0	4.0
Periodic Intelligence Report	3.83	.83	3.0	5.0	4.0
Supplementary Intelligence Report	2.83	1.47	1.0	5.0	3.0
Intelligence Annex	4.33	.49	4.0	5.0	4.0
Intelligence Estimate	4.17	.72	3.0	5.0	4.0
Intelligence Report	3.83	.94	2.0	5.0	4.0
Situation Report	4.58	.51	4.0	5.0	5.0
Imagery Reports	2.50	1.45	1.0	5.0	2.0
Spot Report	4.58	.51	4.0	5.0	5.0
Responses to Information Requests	2.63	1.62	1.0	5.0	2.5
Formal Briefing	4.17	1.03	2.0	5.0	4.5
Informal Briefing	4.42	.67	3.0	5.0	4.5
Collection Priorities	3.42	1.24	1.0	5.0	3.0
Named Areas of Interest (NAIs)	3.42	1.51	1.0	5.0	3.5
Target Areas of Interest (TAIs)	3.50	1.57	1.0	5.0	3.5
Target List	3.67	1.50	1.0	5.0	4.0
Target Nomination	3.67	1.50	1.0	5.0	4.0
Target Priority List	3.50	1.51	1.0	5.0	4.0

Intelligence Product Frequency of Use

Intelligence Product	Response Percentage									
	Don't Use		File		Use Once		Use Repeatedly		Use Right Away	
	Ops	N.O.	Ops	N.O.	Ops	N.O.	Ops	N.O.	Ops	N.O.
Intelligence Summary	0	0	0	13	21	25	57	38	21	25
Periodic Intelligence Report	8	7	0	7	39	50	23	21	31	14
Supplementary Intelligence Report	25	27	0	0	63	45	13	9	0	18
Intelligence Annex	0	7	7	7	20	7	47	71	27	7
Intelligence Estimate	0	7	7	7	20	13	40	47	33	27
Intelligence Report	0	8	0	8	50	39	33	31	17	15
Situation Report	0	0	6	7	19	21	38	21	38	50
Imagery Reports	14	46	29	0	14	36	29	9	14	9
Spot Report	6	0	13	14	31	36	13	7	38	43
Responses to Info Requests	27	36	9	0	27	18	9	18	27	27
Formal Briefing	0	7	0	7	23	29	54	29	23	29
Informal Briefing	0	0	0	7	16	29	62	29	23	36
Collection Priorities	0	15	8	15	31	31	39	31	23	8
Named Areas of Interest (NAIs)	8	18	8	9	15	18	54	27	15	27
Target Areas of Interest (TAIs)	8	9	8	0	15	36	54	27	15	27
Target List	0	8	7	15	14	15	57	38	21	23
Target Nomination	0	18	8	9	23	18	46	36	23	18
Target Priority List	8	15	0	15	25	0	50	46	17	23

Ops = Operations Users

N.O. = Non-Operations Users

Intelligence Product Usefulness: Operations User Group

Intelligence Product	Mean	Standard Deviation	Minimum	Maximum	Median
Intelligence Summary	4.09	.83	2.0	5.0	4.0
Periodic Intelligence Report	3.45	1.04	1.0	5.0	4.0
Supplementary Intelligence Report	2.75	1.28	1.0	5.0	3.0
Intelligence Annex	4.00	1.00	2.0	5.0	4.0
Intelligence Estimate	4.30	.95	2.0	5.0	4.5
Intelligence Report	3.55	.69	2.0	4.0	4.0
Situation Report	3.91	1.04	2.0	5.0	4.0
Imagery Reports	3.10	1.29	1.0	5.0	3.5
Spot Report	3.73	1.35	2.0	5.0	4.0
Responses to Information Requests	3.10	1.10	1.0	4.0	3.5
Formal Briefing	3.27	.65	2.0	4.0	3.0
Informal Briefing	4.00	1.00	2.0	5.0	4.0
Collection Priorities	3.64	1.03	2.0	5.0	3.0
Named Areas of Interest (NAIs)	4.00	.77	3.0	5.0	4.0
Target Areas of Interest (TAIs)	4.18	.75	3.0	5.0	4.0
Target List	3.91	1.04	2.0	5.0	4.0
Target Nomination	3.82	.87	3.0	5.0	4.0
Target Priority List	3.82	.75	3.0	5.0	4.0

Intelligence Product Usefulness: Non-Operations User Group

Intelligence Product	Mean	Standard Deviation	Minimum	Maximum	Median
Intelligence Summary	4.00	.85	2.0	5.0	4.0
Periodic Intelligence Report	3.42	1.00	2.0	5.0	3.0
Supplementary Intelligence Report	3.00	.71	2.0	4.0	3.0
Intelligence Annex	3.50	.67	3.0	5.0	3.0
Intelligence Estimate	4.00	.60	3.0	5.0	4.0
Intelligence Report	3.83	.83	3.0	5.0	4.0
Situation Report	4.42	.67	3.0	5.0	4.5
Imagery Reports	2.78	1.20	1.0	5.0	3.0
Spot Report	4.17	.83	3.0	5.0	4.0
Responses to Information Requests	3.20	1.40	1.0	5.0	3.0
Formal Briefing	3.42	.90	2.0	5.0	3.5
Informal Briefing	3.92	.90	2.0	5.0	4.0
Collection Priorities	2.91	1.58	1.0	5.0	3.0
Named Areas of Interest (NAIs)	3.30	1.49	1.0	5.0	3.5
Target Areas of Interest (TAIs)	3.30	1.34	1.0	5.0	3.5
Target List	3.40	1.26	1.0	5.0	3.5
Target Nomination	3.00	1.56	1.0	5.0	3.0
Target Priority List	3.20	1.55	1.0	5.0	4.0

Intelligence Product Reason for Use

Intelligence Product	Response Percentage							
	Only Source		Best Source		Easy to Use		Most Timely	
	Ops	N.O.	Ops	N.O.	Ops	N.O.	Ops	N.O.
Intelligence Summary	0	30	20	60	80	10	0	0
Periodic Intelligence Report	0	11	20	67	40	22	40	0
Supplementary Intelligence Report	33	17	33	50	33	33	0	0
Intelligence Annex	0	18	60	46	40	27	0	9
Intelligence Estimate	0	18	40	46	40	27	20	9
Intelligence Report	0	20	33	30	67	40	0	10
Situation Report	0	0	14	15	43	15	43	69
Imagery Reports	100	38	0	25	0	25	0	12
Spot Report	0	0	17	15	0	23	83	62
Responses to Info Requests	0	14	33	29	0	14	67	43
Formal Briefing	50	29	0	14	50	29	0	29
Informal Briefing	0	0	0	9	83	36	17	55
Collection Priorities	0	50	50	33	50	17	0	0
Named Areas of Interest (NAIs)	0	17	50	33	17	50	33	0
Target Areas of Interest (TAIs)	0	0	50	50	17	50	33	0
Target List	0	33	0	33	100	33	0	0
Target Nomination	0	33	0	50	100	17	0	0
Target Priority List	0	33	33	33	67	33	0	0

Ops = Operations Users

N.O. = Non-Operations Users

Recommendations for Intelligence Product Improvement

Intelligence Product	Recommendation
Intelligence Summary	Improve timeliness or reporting cycle Increase graphics Time cycle should be tied to intensity of conflict Go to graphic INTSUM format
Periodic Intelligence Report	Improve timeliness Increase graphics
Supplementary Intelligence Report	Improve timeliness Increase graphics
Intelligence Annex	Shorten Use matrix format Improve content
Intelligence Estimate	Lengthen Eliminate redundancy Increase graphics Improve content
Intelligence Report	Improve content
Situation Report	Improve content
Imagery Reports	Improve timeliness If it's more than 2 hours old -- it's probably no good
Spot Report	Improve content Salute format should include time of occurence, not time of submission
Responses to Information Requests	Improve content Improve timeliness
Formal Briefings	Shorten Frequently too bogged down in detail (leave the detail for the INTSUM and INTREP)
Informal Briefings	Improve content Too often don't answer who, what, when, where, how, why - always have to come back and ask questions (refers to G2/S2 tactical update)
Collection Priorities	Explain how the priorities are established and how they are satisfied

MI Product Usage Survey:
Comments from Participants

"The utility of any/all intelligence products is based on two factors and two factors only (any other are sub-factors of the two): two factors are timeliness and credibility. Most intelligence reports are unfortunately historical in nature rather than predictive which directly relates to credibilty. Intelligence analysis is an art not a science. All of the templates in the world are useless unless the analyst has an intuitive grasp of how they relate to 'ground truth.' We must capture somehow and quantify what tools make a good analyst. Obviously, an analyst's own confidence and the how of that confidence must be captured. We must teach risk versus gain; we must teach "how to think"; the process if properly taught will result in a more timely and credible product. Intelligence reporting is not rote and the success of intelligence reporting is not measured by pages produced but rather in lives saved or lost. Good analysts and good analysis is not pontification but a useable credible product, i.e., the (enemy) is here in this strength and he is going to do this. I am at a loss to tell you how we get from where we are now to where we need to be, I simply know we must do something. Perhaps we need to design a course in "Fundamentals of Analysis" which is situational and equipment independent; one which teaches how to do analysis. Then and only then will senior intelligence types realize that they are users of intelligence as well as producers with the end result of timely and credible intelligence products." Comments from a division G2.

"Intelligence reports should go farther in stating or estimating the impact of new information as it relates to the tactical situation and the capabilities/probable courses of action available to the enemy. That is -- should contain preliminary analysis of the impact of new information -- how does it correlate with what we already knew.

Intelligence estimates are generally vague and deal with broad brush statements of likely enemy courses of action. Need to be more specific at the risk of being wrong. Answer specially -- that based upon analysis of all intelligence available, here's what the enemy is likely to do: who, what, when, where, how, why. It's up to the commander to determine the validity of the estimate in order to make his operational decisions. Granted, if you're consistently wrong you'll be seeking employment elsewhere. But don't hedge the bets with broad brush statements.

The few imagery reports I've seen were so old as to be stale by the time I'd seen them. Interested in target locations for artillery fire or close air support. If it's more than 2 hours old - it's probably no good.

Spot reports - the Salute format is very good but as a rule folks submitting Spot Reports don't include sufficient detail for me to be able to use the information. Big problem is with location accuracy and timeliness. Recommend that Salute include time - time of occurence, not time of submission.

Formal briefings frequently get bogged down in detail. Not interested in unit designation, etc. but in the fact that there are X number of regiments of this type at

these approximate locations. Leave the detail to the INTSUM and INTREP. Tell me in general terms whats out there in what strength -- what their strengths and weaknesses are, and most importantly -- what they're likely to do.

Informal briefings -- too often don't answer who what when where how why - always have to come back and ask questions later. In this I refer to a G2/S2 update in tactical situation one-on-one.

To many -- myself included -- the whole procedure by which intelligence is obtained and processed is vague, mysterious, and therefore suspect. Relationships between MI battalions/S2/G2/etc most confusing.

1. My interest is in locating targets with sufficient accuracy to engage with artillery (± 100 meters). G2/S2 needs to be able to advise on reliability and accuracy of source.

2. Timeliness is critical. Old reports on location of mobile forces are worthless if more than just a few minutes old.

3. I've never questioned the credibility of intelligence analysts -- they've always proven to know a lot more about enemy doctrine, organization for combat capabilities, current situation than me. Sometimes I has disagreed with their conclusions - but it's ok to be wrong as long as an earnest effort was made. The biggest problem I'd had is in getting the analyst to commit himself. They always

stop short of saying this is what I believe the enemy is going to do." Comments from a division FSCOORD.

"Brevity is the key to future needs. Short, concise pieces of very useable information that can be transmitted via computers." Comments from a division G3.

" Overall, reduce the bulk, size, and volume of (intelligence) reports." Comments from a division G3.

Regarding assumptions about intelligence -- "I believe everything they tell me -- with a grain of salt."

Experience with intelligence - "trying to get information from intelligence on terrorist activity was like pulling teeth from a duck - the only time we got any information was usually long after the fact - this did not allow us to prepare for contingencies."

Regarding all products: "Intelligence information is often so closely guarded by intelligence personnel as to make it useful to no one. The information tends to flow only in intelligence channels, to the point that the user (ops, log, etc.) must rely only on his intuition not fact."

"Something needs to be done about the dissemination of information out of intelligence channels." Comments from a logistics officer.

Regarding the improvement of intelligence products: "Go to decision support graphics supported by a short written matrix; COA sketches; value of templates as an intelligence product; speed TACFAX type dissemination up and down the echelons and lateral.

'Scope' the products to the consumer echelon below the reporting echelon. i.e., a division sends raw data rapidly down to bde using spot reports but a division send a history report to corps. Probably should not even send it information to bdes, but probably will have to." Comments from an intelligence officer.

"INTSUM. Time cycles on intelligence input must be tied to the intensity of conflict, 12 hours or 24 hour reports in high intensity may be outdated before they are received." Comments from a division chemical officer.

"Generally, the most significant shortcoming relative to intelligence involves the overwhelming volume of information their officers produce. Suggest commander receive critical information only. Good start point is CCIR outlined in FC 101-55." Comments from a division G3Plans.