

# Evolution of Commander's Intent in the United State Military

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## Abstract

*History has seen a fluctuation between centralized and distributed architectures in command and control systems due to the available technology. In order to ensure operational success in future battlefields it is necessary that the United States more effectively incorporate Commander's Intent (CI) into visualization and crosstalk systems. As the only invariant component of Operational Orders, CI will allow for distributed command structures that both coordinate actions and adapt autonomously and instantaneously to ground conditions.*

## Keywords

Commander's Intent, requirements engineering, military science, intention awareness, situational awareness, Command and Control Systems.

## 1. Introduction

Battlefields of the future will inevitably be of a nature fundamentally different than those of today or yesterday, which demands that current capabilities and the course of evolution in combat technology be reassessed. By approaching battle scenarios with a more distributed command architecture it is possible to increase the speed with which situation awareness is updated; each new iteration of C3I technology that enables faster horizontal communication is one step closer to a truly distributed command structure. Such structures are unique in their near real-time transmission of intent from the Commander downwards, allowing for more accurate situational awareness of all the involved players. Able to adapt to ever-changing battle conditions and unforeseen circumstances, distributed command forms are facilitated by instantaneous communication networks. Such networks allow for the omnidirectional communication necessary for accurate dissemination of intent, and thus enhanced situational awareness for all individuals; headquarters is able to establish a centralized, collective SA while individual nodes concomitantly establish their individual SA.

Intention Awareness is an integral component of functioning fighter groups that must be properly established in the information environments created by new battlefield technology and techniques incorporated by the military. Fusing the traditional planning-centric command structures with new systems constructed around Commander Intent will enable the creation of a more adaptive military architecture.

## 2. History of Command and Control Systems

Commander's Intent is a brief directive, usually in written format, that outlines the basic purpose of any given operation; it describes the desired end-state and is thus the unifying factor for any large group of soldiers. In a battalion engaged in a single operation there are numerous different subgroups dedicated to individual specialties (communications, demolitions, recon, intelligence, etc.) however they are cooperating to achieve a singular end-state – it is this cooperative goal that is the content of the CI. History has demonstrated inherent flaws to distributed command structures; as soldiers trade assurance of control for assurance of autonomy and self-induced action a tradeoff exists between flexibility and troop synchronization [1].

Command and Control systems were traditionally consolidated in an individual commander who had the ability to see the entire battlefield, his own troops, and those of the enemy. This strategy of centralized command was appropriate and even effective in terms of the conditions that it was implemented in, however, Napoleon demonstrated the utility of a more decentralized alternative [2]. While still incorporating detailed command techniques, Napoleon developed an organizational method—the *corps d'armee* system—to reduce the uncertainty and complexity inherent in battle. Language, the mode of transfer for combat orders, is often a source of confusion due to its subjective nature – by decentralizing the system, Napoleon was able to decrease the number of translations that orders went through. This structure revolutionized command systems, armies were thereafter thought of more as collectives of distributed

missions that contributed to a common goal- otherwise known as mission-oriented armies.

As time progressed and battlefield communication technology evolved it became possible for an individual to survey the entire battle space and quickly analyze the current situation; thus command and control structures were once again consolidated within a central commander. Furthermore, the concept of organized mission orders was introduced in 1906 by Major Eben Swift who attempted to limit uncertainty through standardized Operational Orders (OPORDs). OPORDs contain a specific 5-paragraph format and are the dominant mechanism for the transfer of information in the battlefield. Theoretically, OPORDs explicitly incorporate Commander's Intent and will convey it to subordinates as it is disseminated; ideally, backbriefing and rehearsals provide for assurance of the individuals' understanding of the CI. Unfortunately however, even the most advanced communication systems of the past contained lag-times that sometimes made backbriefing unpractical. The introduction of the OPORD and simultaneous communication systems enabled mission orders to move vertically downwards from a single commander who was fairly well informed due to upward vertical movement of intelligence from ground nodes. This particular architecture is more conducive to a solely planning-centric command and lacks the ability to adapt to the dynamic and frequently chaotic battlefield.

There have been recent accomplishments and subsequent attempts to further address the inadequacy of planning-centric command systems by ensuring transmission of CI [3]. Although plans are integral for the success of missions, they frequently become obsolete due to sometimes drastic changes in battle environments and operational conditions. In such circumstances it is only the individual warfighter's cognizance of his CI that will allow for effective adaptability and mission success. The next iteration of battlefield command and communication technologies will facilitate near-instantaneous vertical communication as well as horizontal communication among deployed troops. With real-time feedback capability it is then possible to conduct the large-scale backbriefs and rehearsals that previously existed only in theory. Future Digital Cross-Talk systems will be designed to ensure that individuals understand their Commander's Intent as it is transmitted in OPORDs.

### 3. Current Military Use of Intent

In military literature and lingo, intentions are expressed in association to an order such as a Warning Order (WARNO), an Operational Order (OPORD), or a Fragmentary Order (FRAGO); they are expressed in the

context of future plans or actions. The military use of the term intention or intent has a specific meaning to the ears and minds of trained soldiers. A trained soldier is unlikely to confuse the meaning of the word *intent* with the words *objective*, *purpose*, *task*, or *aim*. The word intent is explicitly used in oral or written briefings with a very clear connotation. OPORDs even incorporate a subparagraph called Intent as part of the Execution paragraph in the OPORD's 5-paragraph format [4]. Usually operators giving OPORD presentations clearly use the word intent or intention and do not substitute words for these concepts.

To better understand how intentions are originated, communicated, and transmitted in the military, it is best to analyze them in their actual existing and working context. In the military, intentions are expressed in the context of an oral or written order. Orders comprise two general classes: *combat* and *routine*. Combat orders pertain to the strategic or tactical operations and combat service support (CSS) of tactical operations. A combat order may be issued initially as a plan, so as to become an order at some future time. Besides directives and letters of instruction, combat orders include:

- Operational Orders (OPORDs)
- Administrative and Logistic Orders (ALOs)
- Standing or Standard Operating Procedures (SOPs)
- Warning Orders (WARNOs)
- Fragmentary Orders (FRAGOs)

OPORDs provide for coordinated action to carry out a commander's decision toward the conduct of an operation. CSS commanders also use OPORDs, which include tactical movement orders [5], to task their units. ALOs provide coordinated CSS for the command and for the administrative movements. As standing orders, SOPs prescribe routine methods for the implementation of operations. WARNOs, brief oral or written messages, give preliminary notice of ensuing actions or orders. FRAGOs are also brief oral or written messages and are used to update or change previous orders and provide extracts from the more detailed OPORDs from which they originated. A form of FRAGOs, mission orders provide experienced commanders with the essential elements of an order: the commander mission or changes to a previously issued mission. Always brief, mission orders include the purpose of the mission and may be oral, written, or graphical. Routine orders cover normal administrative operations in garrison and include permanent orders, court-martial orders, bulletins, circulars, and memorandums [6].

According to the U.S. army doctrine, OPORDs and ALOs have a specific 5-paragraph format while all other orders (WARNOs, SOPs, and FRAGOs) lack a specified format. However, the prevailing doctrine highly recommends also using the 5-paragraph format for FRAGOs. Combat orders<sup>1</sup> are the dominant mechanism for the transference and dissemination of information in the field.

The most frequent types of orders in the military are those developed in response to orders received from a higher command post. In this case, a commander and his staff work within the context of the received order and analyze the mission and the superior Commander Intent prior to issuing orders to subordinates units [7]. The officiating commander therefore develops his intent as a response to the intent of his superior commander in the context of an order. Hence, a slight difference occurs in the process and activities between orders produced as a response to orders and those produced as a response to situations. In both cases, as intent trickles down from the highest to the lowest level of command, a multitude of interpretations and rewrites affect this initial statement, which can easily cause degradation of the original intended information.

Intentions are expressed in the context of an order. Orders, however, arise in response to an order from a higher command post or to a situation that requires military action. Orders developed in response to a situation mainly occur on high-level command posts such as a theater army level or corps level. However, depending on the command and control structure, a smaller commanding post might develop its own orders. Orders are always developed as a result of specific procedures detailed by doctrine [7]. These procedures involve the following:

- Situation Analysis
- Decision-making
- Planning and Plans
- Issuing Orders

The situation analysis process requires recognizing and defining situation problems, in addition to gathering the facts and making the necessary assumptions to determine the situation's scope. The commander's staff officers establish an information plan based on their needs as dictated by experience. The information collection plan provides appropriate and sufficient information to adequately support the staff officer's estimate of the situation. The plan is recorded in order to scrutinize all

applicable areas, and to maintain all necessary information. Information collection plans are normally revised to reflect changing situations. Staff officers collate and analyze information in their respective areas of responsibility. Before information is presented to the commander, it is analyzed and condensed. Its significance, reliability, and completeness are assessed.

The decision-making process requires making assumptions, establishing estimates, developing possible solutions, analyzing and comparing possible solutions, and selecting the best situational solution. Members of the commander's staff prepare estimates to assist their commander in making a decision. A staff estimate consists of significant facts, events, conclusions based on the current situation, and recommendations on how to best use available resources. The commander uses such recommendations to select feasible courses of action for further analysis. Adequate plans hinge on early and continuing estimates by staff officers. The decision-making process provides, as an end-result, the mission's development and CI formulation. Consequently, a commander's staff prepares and issues plans and orders to carry out his mission and intent, ensuring coordination of all necessary details. The commander may delegate authority to staff officers to issue plans and orders without his personal approval. However, a signal staff officer prepares and publishes a plan or order. U.S. military doctrine details plans and planning procedures [8].

#### 4. Combat Orders

In language, as in warfare, many factors simply cannot be operationalized. For this reason language serves as a clouding layer of uncertainty in propagating intentions. In the military, orders propagate language through time and space. Orders serve as buffers that contextualize and establish the integrity of the intent. Likewise, the intent serves as a buffer for retaining the integrity of the other order attributes. Intentions have specific functional roles in people's lives. The mental state of intention usually requires that one believes the achievement of some act is possible and can bring about that act by engaging in certain activities [9]. Therefore, the effective capture and transmission of the CI within the structure of combat orders is essential in order to guarantee both the integrity of communications and the coherence of actions.

Whether through written or oral communication, orders convey information governing action. From a practical standpoint, the military uses the terms "command," "order," "directive," and "letter of instructions" synonymously. The terms "command" or "order" imply less choice in details of execution than other forms of

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<sup>1</sup> Combat Orders are hereafter referred to as "orders," unless indicated otherwise.

orders. The term "directive" most often serves to describe a communication in which policy is established or a specific action is ordered. "Letter of instructions" describes a form of order that provides information regarding broad aims, policies, and strategic plans for operations in large areas over a considerable period of time [10].

While OPORDs and ALOs follow a 5-paragraph format other combat orders do not follow a specific format [2]. However, combat orders must meet certain characteristics regardless of their format. As described by the US Field Manual 101-5, these characteristics include:

**Clarity.** Each command post or agency that uses a combat order must understand it thoroughly. The use of highly technical language can cause misinterpretation. Use of accepted doctrinally established military terminology and phraseology conveys identical meanings to all using agencies.

**Completeness.** The order contains all the information and instructions necessary to coordinate and to execute the operation. The order must convey the purpose or intent of the commander, so subordinate commanders will be able to accomplish their mission without further instructions. The completeness of an order also must include sufficient detail in order that all subordinate commanders know what other units are doing.

**Brevity.** Unnecessary detail is avoided. However, clarity and completeness are not sacrificed in the interest of brevity.

**Recognition of subordinate commanders' prerogatives.** The order should not infringe on the initiative of a subordinate commander by prescribing details of execution. Only under unusual circumstances, such as an operation requiring extremely close cooperation and timing, should a subordinate commander be told precisely how to perform an assigned task.

**Use of the affirmative form.** In the interest of simplicity and clarity, the affirmative form of expression is used through all combat orders. Wording such as "The trains will not accompany the brigade" is improper for two reasons: first, the intent of the orders depends on the word "not"; second, actual disposition of the trains is not indicated. The proper affirmative form is "Trains will remain in the assembly area."

**Avoidance of qualified directives.** Such an expression as "attack vigorously" is not only meaningless, but also weakens the force of subsequent directives, in which the qualifying adverb does not appear. Such expressions as

"try to hold" and "as far as possible" lessen responsibility. Instead, use of a term such as "main attack" is adequate, clear, and does not require further qualification.

**Authoritative expression.** The orders reflect the CI and will. Indecisive, vague, and ambiguous language indicates indecision and leads to uncertainty and lack of confidence by subordinates. The commander tells his subordinates in direct and unmistakable terms exactly what he wants them to do.

**Timeliness.** Timely distribution of orders allows subordinate commanders sufficient time for planning and preparation.

The expression of the CI in orders, regardless of their format, should be present in the order as explicitly indicated by the Completeness and Authoritative expression characteristics of combat orders. The actual military practice is to express CI when transmitting orders and conducting briefings.

Once an order has been issued there are two different mechanisms in place to ensure that the integrity of the order was preserved during transmission; backbriefs and rehearsals are commonly utilized as safeguard mechanisms. The effectiveness of these two methods is greatly enhanced by cross-talk technology that allows for instantaneous horizontal and vertical communication.

Combat orders are sometimes issued with annexes. At times presented in the form of a text, an annex may also take the form of a trace, overlay, overprinted map, sketch, plan, or table. Annexes include:

- Details that amplify the basic order like operation overlay, intelligence instructions.
- Combat support instructions such as fire support and engineer;
- CSS instructions, including service support overlay, traffic circulation, and control instructions;
- Information or instructions on related operations like PSYOPs and rear area protection;
- Any other information or directions required to amplify the order.

The staff officer responsible for activity or service covered by the annex prepares this annex. The annex then provides an integral part of the order that addresses one aspect of an operation, such as fire support. The needs of the particular order determine the number or type of annexes used. Its purpose is to keep the basic text of an

order short. Annexes may be issued simultaneously with the order or distributed separately. Annexes do allow selective distribution of certain information, however unless there is good reason to the contrary each copy of an order is issued complete with all annexes [11]. The use of annexes does not prevent the inclusion of all information essential to the effective employment of all command elements within the body of the order.

Combat orders are sometimes issued with an operation overlay, which traces graphic control measures on a map. The overlay shows boundaries, unit positions, route, objectives, and other control measures. By incorporating detailed visuals intent may be more cleanly transmitted than in just a written combat order, especially an OPORD. When possible, commanders use actual terrain or a terrain model<sup>2</sup> to brief their orders. Commanders may also use concept sketches<sup>3</sup>—large, rough drawings of the objective areas that clearly illustrate the flow of events and actions. To better understand the format and structure of these orders, OPORD are examined in more details below.

## 5. The 5-Paragraph OPORD

The OPORD is perhaps the simplest type of order to study for understanding the propagation of CI. In the real world actors do not always adhere to the 5-paragraph format. Despite any difference in the formats used for the OPORDs, the content of these different OPORD formats were very similar.

The 5-paragraph OPORD consists of two parts: Task Organization and the OPORD's main body. The latter consists of five paragraphs discussed in further detail below: Situation, Mission, Execution, Service Support, and Command and Signal [12].

**Task Organization:** Task Organization explains the unit's organization for the operation. If previous task organization has not changed, then "no change" is indicated. An offensive task organization statement might include the following: "Task organization is 1st Squad with two of the platoon's machine guns, 2d Squad, 3d Squad."

The OPORD format has a multitude of components or knowledge layers forming its structure. These knowledge

layers are represented in and distributed across the five paragraphs. Although OPORDs and other combat orders do not necessary follow the 5-paragraph format, they always include similar content and have to meet the standards or the characteristics of good combat orders mentioned earlier.

The knowledge layers differ in content and means served. Different commander's staff members contribute to the OPORD at different components. For example, information in the mission statement differs from information provided in the Command and Signal paragraph. Information in the Situation paragraph differs from information in the Execution paragraph, etc. The central issue, however, concerns the value and purpose of these different layers of knowledge in combat orders, as combat orders are essentially plans. In addition, ensuing actions rarely follow plans exactly. The chaotic environment of the battlefield seems to favor *ad hoc* decisions. In order to understand how to best create orders for unplanned contingencies, one must explicitly identify and leverage any invariant elements within the communication, as these will remain valid for nearly any case scenario.

## 6. Invariants of Combat Orders

Combat orders essentially present plans for action responding to a known situation in a certain way described in the Concept of Operation so as to satisfy the Commander's Intent. CI is either a specific application of a higher CI, or in a few cases, a specific response to an emerging situation, provided command and control regulations allow for initiating self-developed intentions rather than influenced intentions. Plans emerge from a process indoctrinated with extensive training, equipping, and organizing of forces. As previously indicated, the US Army has traditionally tended towards planning-centric command. Despite the chaotic nature of war, planning and plans have proven a vital necessity. In order to be effective in the chaos of battle, combat orders *must contain an invariant factor* unaffected by the changing conditions of the conflict. These invariants make the combat order indispensable under almost all circumstances.

Objectives and intentions are the two logical candidates for such an invariant. The situation, mission, and execution subparagraphs are all subject to alteration, modification, or refinement in light of new information, techniques of maneuvers, situational difficulties, and FRAGOs. More stable than these ever-dynamic layers of knowledge, objectives and intentions are also set apart in military literature. According to most military

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<sup>2</sup> A three-dimensional scale model of the terrain, a terrain model is an effective tool for briefing and discussing actions related to the objective.

<sup>3</sup> Not necessarily drawn to scale, the concept sketch shows the locations and position of objectives, control measures, and key terrain in relation to each other.

dictionaries, an objective physically represents the action taken through a definite tactical feature, such as the seizure of a bridge. Intentions, on the other hand, represent a vision, the strategic thinking driving the mission. Missions have only one intention, while the Concept of Operation section in a combat order may contain any number of objectives. Objectives are the short-term tactical steps essential to accomplish the mission, which is composed of a combination of tactical puzzles and difficulties. Intentions, conversely, tend to consist more of tactical difficulties than puzzles.

While puzzles are tactical problems or challenges that do not require active, explicit decision-making techniques, tactical puzzles do have definite solutions. "Algorithms," techniques, and procedures learned in battle drills can solve these types of problems. Solutions to puzzles are therefore easily quantified, formalized, taught, and practiced. Difficulties, on the other hand, have no fixed solutions. They rely on a decision-making process. Some tactical difficulties are unsolvable and can only be reduced, endured, or avoided namely through tactical puzzles.

Combat orders contain the intentions of superior commanders (two levels up) in addition to the intention of the commander issuing the order. In fact, intention is the only layer of knowledge transmitted without alteration in combat orders. No other layers of knowledge revealed in combat orders, especially OPORDs, are so resistant to change or alteration.

Most combat orders are transmitted in a series of orders from higher to lower levels. Any alteration to a CI at some stage affects the overall outcome of operations and can be extremely dangerous. A CI cannot be altered in an ad-hoc fashion simply because an element occurred differently than planned. The Commander's Intent rather represents an invariant of a combat order. Indeed,

1. The fact that military organizations rely heavily on combat orders for conducting military operations reveals a stable and invariant element in combat orders despite the extremely temporal and chaotic nature of the environments combat orders serve;
2. The very nature of the concept of intention makes it impervious to reactive alteration or ad-hoc modification.

Given that a CI is the invariant factor in combat orders, it therefore primarily defines the *order* amidst the chaos of

battle. The variant, or situation-dependent, layers of knowledge create a reference point from which one can then understand the CI in context. These layers may indeed serve as temporal agents during operations, yet they provide a stable contextual container for the CI. Consequently, the logical and spatial container for CI within a combat order as provided by these layers of knowledge creates intention visualization, commonly referred to as IA. In other words,

- CI has to travel in time and space through a logical and spatial container (carrier) in order to operationalize the CI;
- Without a logical and spatial container, the CI has no context and thus the intent will hold no meaning;
- The logical and spatial container sets the context and provides the proper environment within which to create and establish intention visualization.

Once awareness of the Commander's Intent has been established, the initial logical and spatial container is no longer essential. The logical and spatial container can be reconstructed in an ad-hoc fashion so as to satisfy the Commander's Intent in the dynamic reality on the battlefield.

## 7. Plan-Systems

Intentions are always realized through a plan-for-action that directly guides behavior. As described earlier, the intention's logical and spatial container includes this plan of action. Once troops are engaged in battle various knowledge layers of a plan-for-action may require change, alteration, or omission, while the intention will remain an invariant. In a Plan-System intention invariants manifest themselves in two distinctly different forms:

- **Strategic Intentions** – Invariant in nature; Specifies the ultimate desired end-state condition of the mission overall and provides guidance and reference from which individuals construct their own tactical intentions. Provides a long-term invariant construct.
- **Tactical Intentions** – Variant in nature; Specifies a single step in the process towards realization of the Strategic Intention; more ephemeral in content, Tactical Intentions occur on a localized scale and are edited or omitted as necessary during mission execution.

Strategic Intentions are directly deduced from the Commander's Intent and provide conceptualization of the end-state of the mission in general for all the actors involved in the mission. It is through the execution of smaller, more short-term and localized Tactical Intentions that the overall Strategic Intention is realized [13]. Differentiating between these two types of intention is necessary in light of a potentially different plan-for-action, which will realize the same Strategic Intention.

Strategic and Tactical Intentions relate to one another in an atomic formation. In the context of military organizations, CI travels through time and space within a combat order. As the primary invariant factor of a combat order, the CI therefore indicates a Strategic Intention. A variant knowledge layer of a combat order, the plan-for-action comprises the Concept of Operation, maneuvers, movements, objectives, fires, tasks, etc. The plan-for-action system thus indicates an atomic structure consisting of 1) a Strategic Intention and 2) transformations or relations of Tactical Intentions.

The information of any plan, not just in a military setting, can be grouped into two classes. The first class consists of *intentions*, mainly Tactical Intentions or short-term intentions. However, this class may contain some Strategic Intentions invariant regardless of what actually happens during plan execution. The second class consists of *space-time-action components*. Because it consists of components with different attributes, this class is difficult to recognize or define. Some, but not all, of these components may have physical attributes. Certain, but not all, components describe ways of realizing objectives with physical attributes. This second class is also termed transformations or relations because these components transform one Tactical Intention to another. Furthermore, these components tend to define dynamic relations among these Tactical Intentions.

In order to highlight Tactical Intentions and the transformation components, consider the following statement extracted from an OPORD in the Execution paragraph's Concept of Operation subparagraph.

*Concept of Operations:* My intent is to occupy BP2 with two squads. We will destroy forces in EA FOX and prevent envelopment of main effort. One squad will destroy lead element forces, in vicinity of minefield forcing them to move into EA FOX. We will destroy him as he enters this area. We cannot envelop 2<sup>nd</sup> Platoon.

*Maneuver:* 1<sup>st</sup> Squad destroys lead element to cause the enemy to deploy. 2<sup>nd</sup> Squad, main effort, destroys the enemy in EA FOX to prevent the envelopment of 2<sup>nd</sup> Platoon. 3<sup>rd</sup> Squad blocks enemy forces attempting to envelop 2<sup>nd</sup> Squad. Once the enemy crosses Comanche Road, all elements should be firing.

*Fires:* Priority of fires is to 3<sup>rd</sup> Squad initially, priority shifts to 2<sup>nd</sup> Squad during the enemy's assault.

The phrase "occupy BP2" in "My intent is to occupy BP2" indicates the CI as well as a Strategic Intention. Tactical Intentions include "destroy forces in EA FOX" and "prevent envelopment of main effort." "EA FOX" and "BP2" are physical objectives and are therefore elements of a transformation class. The phrase "forcing them to move into EA FOX" also indicates a Tactical Intention. However, the Maneuver and Fires sections do describe how these Tactical Intentions will be realized in concise but sufficient terms. The Intentions allow for flexibility and initiatives so that soldiers can operate as they see feasible on the battlefield ground.

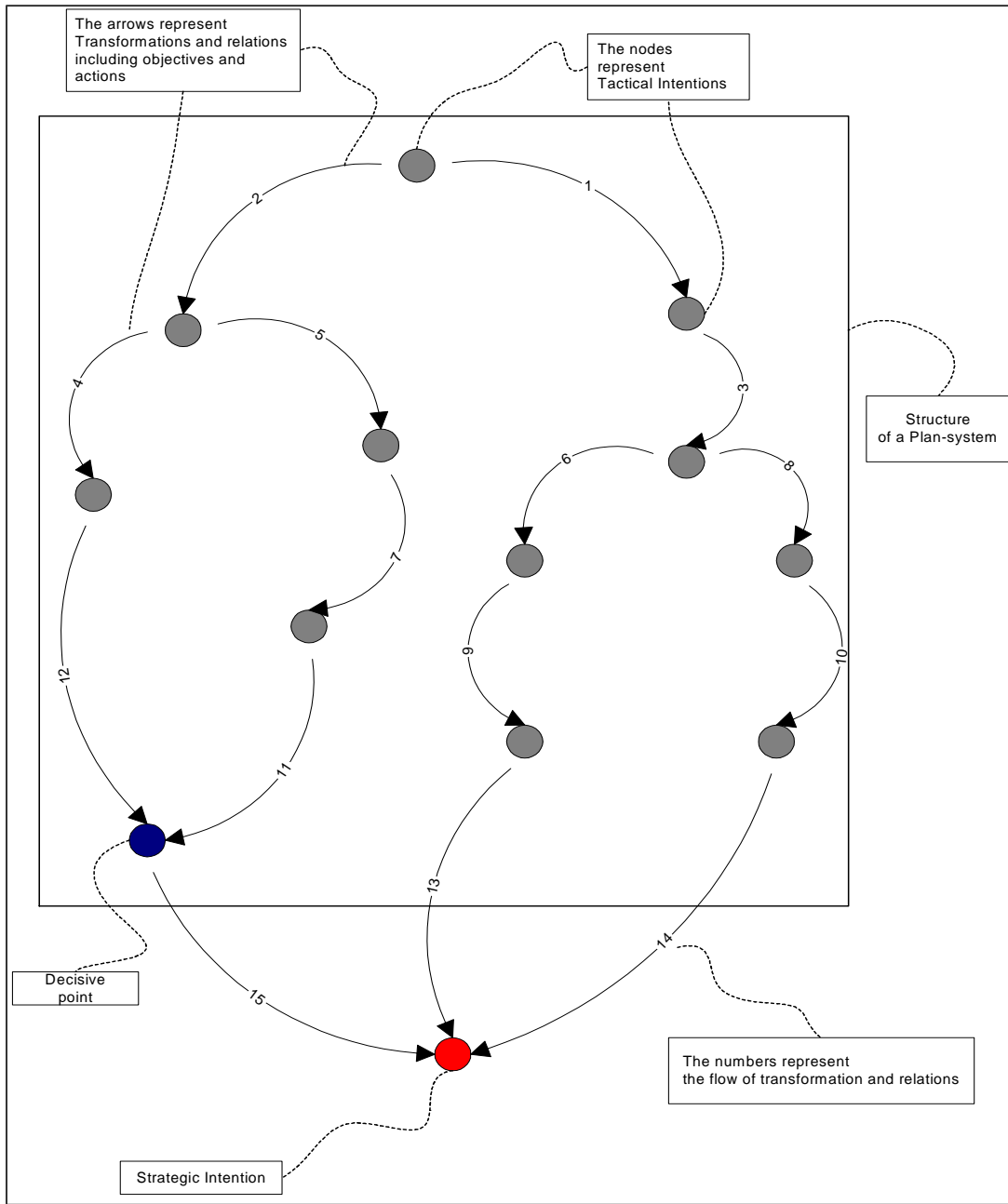


Figure 1. Graph diagram of Plan Systems

Plan-Systems can be modeled using a graph represented by nodes and edges (See Figure 1). The nodes correspond to both tactical and strategic intentions, and the edges correspond to transformation and relations. The edges of this graph indicate the flow and order of future planned actions. At this point, a graph-oriented modeling, presents the main advantage of illustrating the differences between Strategic Intentions and Tactical Intentions. Such a graph does not serve to offer an alternative technique for establishing the visualization or communication of Plan-Systems. Furthermore, a graph-oriented modeling highlights both the structure of Plan-Systems and the

distinction between the content of these as compared to plans.

Every Plan-System has both a single Strategic Intention and one or more Tactical Intentions. A sequence of actions relating one Tactical Intention to the next materializes the Strategic Intention. This process creates a fundamental structure, in which the order of the action flow is called a “plan” in the vernacular. While Strategic Intentions do not vary, Tactical Intentions, may change in an ad-hoc fashion depending on the surrounding environment. In practice, actions and events do not go as

anticipated and planned. One often changes Tactical Intentions, while still remaining focused on the same Strategic Intention. The actual structure of a Plan-System with one invariant Strategic Intention may therefore vary depending on change in Tactical Intentions. Situational reports and Fragmentary Orders (FRAGOs), amongst others, show how military organizations respond to and act upon changing situations during military operations. Variations in materialized Tactical Intentions bring about these changing situations. Therefore, IA of a Strategic Intention allows for the subsequent construction of Tactical Intentions that satisfy the SI which results in the creation of a Plan-System (PS). Thus establishing Tactical IA is as important as establishing Strategic Intentions. As the following figure illustrates, once tactical IA has been established, Strategic Intention Awareness leads to Situation Awareness of the individual.

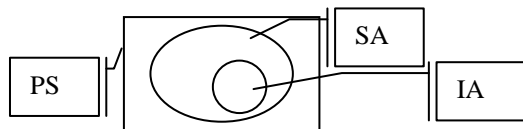


Figure 2. Intention Awareness as a subset of SA in C3I Plan-Systems

Based upon the instructions and regulations of U.S. doctrine, in addition to the actual practice of military professionals, commanders always express and transmit their intents in a combat order context. Regardless of whether the order is oral or written, whether it exists in an OPORD or a FRAGO, or whether it is in a standard format or not, it must always express the Commander's Intent. The author distinctly remembers the last words of a commander directing his subordinate commanders at the end of an OPORD briefing, stressing the importance of understanding his intent and the importance of developing their intent (subordinate commanders' intent) where it applies to the CI and their role in operations.

U.S. military doctrine prescribes a particular methodology by which commanders analyze combat orders received from a higher commander post. The commanders complete this process before they actually start producing their own combat orders to their subordinates. The process may vary considerably depending on the size of the combat units involved. If a brigade commander receives the order, then the commander's staff will be heavily involved in the mission analysis applying their specialized expertise. However, if a squad leader receives the order, then he bears sole responsibility to analyze the mission and issue orders. Despite the differences in these two cases, the process bears striking similarities. A more detailed discussion of this process is provided below.

Suppose a leader of a unit receives an order from a higher commander post. The leader may receive a WARNO, an OPORD, or a FRAGO. Regardless of the type of order, the leader immediately begins to analyze the order received using the factors of METT-TC—mission, enemy, terrain, troops, time, and civilian—by asking the following questions [14]:

- What is the mission?
- What is known about the enemy?
- How will terrain and weather affect the operation?
- What troops are available?
- How much time is available?

Based upon this analysis, the leader enters into the WOSF cycle. This dynamic cycle consists of four entities: WARNO, OPORD, Situational Report, and FRAGO. The METT-TC factors serve to establish the Intention Awareness of both tactical and strategic intentions [6]. This mission analysis generates a WARNO and then an OPORD. However, this mission analysis process creates a clear understanding of the higher CI related to the mission received. Additional analysis establishes more internal understanding of intention that ultimately yields intention visualization. Once the commander establishes IA of his superior CI, he can generate his own intent and transmit it to his subordinates. Understanding both tactical and strategic IA has a direct impact on the effectiveness of SA however it is essential that systems be in place to monitor this understanding as it is communicated amongst individuals.

## 8. Tracking Intent

Different types of checks are performed in order to determine whether or not a subordinate commander has understood the order and the Commander's Intent. These checks are inherently limited in effectiveness as the size of the troops in the exercise increases due to the limited communications technology. The checks consist primarily of the *back brief* and *rehearsal*. The back brief most commonly immediately follows an order brief. During the back brief, the subordinate commander briefs his superior commander. He informs the superior commanders of which tasks must be accomplished based on the OPORD he has just received. The superior commander will sometimes ask pointed and very specific questions to ensure that the subordinate commander has properly understood the mission's intent.

For example, a brigade commander may ask a battalion commander when the battalion should be deployed along a certain phase line. The battalion may need to be

positioned at PL Tacoma by H+6 in order to ensure that it can assist the rearward passage of a cavalry squadron's lines through the brigade's sector. The superior commander conducts this back brief with all of the subordinate commanders. He may ask the field artillery commander about when and to whom the priority of fires shifts during a certain portion of the operation. He may also enquire the priority of engineer support from the engineer commander. A brigade commander may ask the Forward Support Battalion commander to back brief him on the priority of maintenance support. In short, the superior commander can query subordinate commanders about whichever areas he believes require clarification during a back brief.

The rehearsal conducts the second check necessary to ensure a clear understanding of the CI. Also called "rock drills," these rehearsals include several different types. The rehearsal occurs following receipt an OPORD. Depending on the level of unit discussed, the rehearsal can either immediately follow a platoon OPORD, occur four hours after the battalion OPORD, or take place a day after the brigade order. The type of rehearsal depends on the amount of time available. If possible, a unit could conduct a full-scale rehearsal with all troops and vehicles on the terrain.

The rehearsals conducted by the 1<sup>st</sup> Infantry Division during Operation Desert Storm provide a good example of this practice. The division was required to breach the berm, or raised dirt bank, built as part of the Iraqi defenses. The U.S. division constructed a berm as similar as possible, and made attempts to breach that obstacle so that every commander and soldier knew exactly their future actions during the actual breach. A rehearsal can work from a map, a terrain board, or on the ground. The most common form of rehearsal is the rock drill, conducted with the subordinate commanders. The superior commander's staff prepares a piece of terrain and makes a replica of the location where the unit will operate. String represents boundaries, while limits, phase lines, and index cards represent objectives and targets. The staff may also use any other items deemed necessary to make the battlefield come to life. Commanders represent their units, and as they move on the ground, explain their actions at that time. The S-2/G-2 depict and brief enemy actions during the rock drill, usually the last procedure a superior commander may use to ensure that subordinate commanders have understood their mission and its governing intent.

In the past FM radios have been used in conducting large-scale rehearsals. During field research, the author witnessed a fire support rehearsal at brigade level via FM radio. Key players included the brigade, battalion and

company fire support officers, the field artillery battalion commander, the field artillery TOC, the battery commanders, and the radar section. A radio rehearsal was conducted as these forces were spread out too far across the battlefield to meet face-to-face. Conducted in the same manner, the rehearsal featured the S-2 playing the role of the enemy, while subordinate commanders and other key players took action at the appropriate time during battle. This rehearsal played a key role in ensuring the understanding of each target's intent in the brigade plan. These rehearsals helped the various commanders visualize the pending operation and assured synchronization of the fire support plan and the field artillery support plan with the brigade plan and the brigade CI. Incorporated into C31 systems, advanced digital battlefield visualization and simulation technologies would allow to conduct rehearsals and rock drills far more easily, more realistically, and more often. Once completed, these digital rock drills could be later used to provide additional mission guidance (IA) and referenced for learning purposes.

Horizontal coordination occurs during all of the phases mentioned above. If a coordination problem arises during the OPORD, the affected unit commanders or the superior commander may highlight this problem and ask his staff to make the necessary changes. Coordination problems may also arise during the subordinate units' planning process. These units may discover a coordination problem with an adjacent unit and ask the superior unit for help. At times, a coordination problem may not appear until the rock drill. Based on the earlier example of rearward passage of lines, the battalion commander responsible for assisting the cavalry RPOL may find, during the rock drill, that a slow logistics convoy slows down his travel on the main supply route, and that he cannot reach the appropriate phase line by the designated time. The solution to this problem may simply require the maneuver battalion commander and the forward support battalion commander to discuss and resolve the issue. The brigade commander may also ask his staff to study the issue and change the applicable portion of the plan.

## **9. Conclusion**

Misunderstanding the CI can lead to problems at all levels. At the staff level, if the staff as a whole or a particular staff section misunderstand the intent, they can waste an inordinate amount of time in developing courses of action that do not conform with how the commander visualizes the battle and how he sees his unit positioned to conduct future operations. At the subordinate commander level, misunderstanding of intent may lead to a

subordinate unit plan that fails to achieve the superior commander's goals for that operation.

Clearly there is a philosophical foundation built into US military doctrine centered around the importance of Commander Intent; indeed, armies have utilized CI for a number of years. As the US Military prepares for battlefields of the future it is imperative that C3I systems be developed in order to incorporate battlefield visualization and cross-talk systems that allow for more effective troop simulation and battle coordination. Only by creating C3I systems that enhance individual as well as collective Situation Awareness will it be possible to move towards a US military that possesses the ability to synchronize their adaptation to constantly dynamic mission environments.

## 12. References

[1] L. G. Shattuck, "Communicating Intent and Imparting Presence," *Military Review*, Mar, 2000, pp. 66-72.

[2] M.V. Crevel, *Command in War*, Cambridge: Harvard University Press, 1985.

[3] US Department of Defense, *Military Transformation: A Strategic Approach*. Washington, DC: Department of Defense, 2003.

[4] US Department of the Army, *STANAG 2014: Operations Orders, Annexes to Operations Orders, Administrative and Logistic Orders*. Washington, DC: Headquarters, Department of the Army, Aug, 1991.

[5] US Department of the Army, *STANAG 2041: Operation Orders, tables and Graphs for Road Movement*. Washington, DC: Headquarters, Department of the Army, Aug, 1980.

[6] US Department of the Army, *FM [Field Manual] 101-5: Staff Organization and Operations*. Washington, DC: Headquarters, Department of the Army, May, 1984, pp. 4.1.

[7] Commander, Joint Warfighting Center, *Concept for Future Joint Operations Expanding Joint Vision 2010*. Washington, DC: Joint Chiefs of Staff, May, 1997.

[8] US Department of the Army, *FM [Field Manual] 101-5: Staff Organization and Operations*. Washington, DC: Headquarters, Department of the Army, May, 1984, pp. 6.9.

[9] R. W. Gibbs, *Intentions in the Experience of Meaning*. Cambridge: Cambridge University Press, 1999.

[10] US Department of the Army, *FM [Field Manual] 101-5: Staff Organization and Operations*. Washington, DC: Headquarters, Department of the Army, May, 1984, pp. 7.1.

[11] US Department of the Army, *FM [Field Manual] 101-5: Staff Organization and Operations*. Washington, DC: Headquarters, Department of the Army, May, 1984, pp. 7.5.

[12] US Department of the Army, *FM [Field Manual] 7-8: Infantry Rifle Platoon and Squad*. Washington, DC: Headquarters, Department of the Army, 1992, pp. 11-21.

[13] D. S. Alberts and R. E. Hayes, *Power to the Edge: Command & Control in the Information Age*. Washington, DC: Center for Advanced Concepts and Technology, June, 2003.

[14] US Department of the Army, *FM [Field Manual] 7-8: Infantry Rifle Platoon and Squad*. Washington, DC: Headquarters, Department of the Army, 1992, pp. 2-4.