

Information Maneuver in the United States Marine Corps

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Abstract: In 2017, Secretary of Defense James Mattis formally addressed and introduced the seventh joint warfighting function: information. This resulted in an explosion of literature across the military services in an attempt to define this new function and its many facets. Research reveals information can be viewed as data with meaning, a domain, a warfighting function, and an action when paired with maneuver. Conceptual frameworks have been proposed for the latter, but no consensus has been reached between service branches. Specifically, maneuver within the information environment has yet to be defined. The physical aspect of maneuver can be understood through actions executed in time and space. However, maneuver becomes an abstract concept as soon as the information environment is introduced. This becomes a problem for practitioners, planners and commanders alike when implemented without foundational direction. A framework must be provided for Marines to learn, implement, and refine. This paper aims to: 1) define information maneuver, 2) accentuate the relationship between information maneuver, the information warfighting function, and the six remaining warfighting functions, 3) delineate the need for research that develops the Marine Corps' understanding of information maneuver to enable effective employment of information maneuver specialists.

Keywords: Information, Information environment, Maneuver, Information maneuver, Information warfare

1. Introduction

Military professionals seek advantages through maneuver in the physical world. However, maneuvering in the information environment and the relation to the other warfighting functions is nascent and ambiguous. Sun Tzu said, "just as water retains no constant shape, so in warfare there are no constant conditions" (2014). While information has been an aspect of war since the dawn of conflict, traditional tactics and doctrine fail to keep pace with information related advancements within the information environment.

Klonowski (2021) in his article to the Marine Corps Gazette poses the question, "are we cognizant enough of ongoing actors who are effectively using information operations in open conflict in a manner we currently view as incomprehensible?" A tactical vignette seen in the Russo-Ukrainian war accentuates information operations in execution. Families of Ukrainian soldiers received fake messages from Russian operatives indicating the death of their soldier. When the families attempted to contact their soldiers for verification, the influx of data to cell phones illuminated Ukrainian positions for targeting by Russian artillery (Klonowski, 2021). The Russians expertly maneuvered within the information environment resulting in a kinetic effect. However, are there conceptually defined demarcation lines between information maneuver and function such that our forces must adapt to the changing dynamics of war to maintain a competitive advantage.

The United States Marine Corps has adopted definitions for the information environment (IE) and operations in the information environment (OIE) from the joint level. Despite these definitions, ambiguity exists in how to maneuver within IE. Neither joint publications nor United States Marine Corps doctrine provides a clear definition of information maneuver. This gap has ramifications such as incomplete training of Marines, inhibiting execution of commander's intent and limiting the operational effectiveness.

The focus of this paper is to accentuate relationships between information and maneuver concepts, and to infer the basis of a conceptual framework of information maneuver for the Marine Corps. A conceptual framework is necessary for the Marine Corp as its absence could hinder command and control processes and could lead to deficient decisions and imprudent risks at all levels. Moreover, an improved conceptual framework can ameliorate the relationship between the concept of information maneuver and its interaction with other warfighting functions. In doing so, the Marine Corps can empower subordinates to adapt in the ever-changing information domain. This paper is a systemic literature review that aims to first define information, the information environment, and maneuver to yield the Marine Corps' assumptions for information maneuver (IM). This paper is an attempt to narrow the scope to surmise Marine Corps definitions and concepts. Having a conceptual framework can enable us to draw conclusions about the scope of information maneuver and illustrate the relation to the warfighting functions.

2. Literature Review

Information maneuver has always been a part of warfare, under different names and forms. From the use of espionage and intelligence in ancient battles to the sophisticated psychological operations and cyber warfare of today, the strategic use of information to influence, deceive, and disrupt adversaries has been a cornerstone of military tactics. Regardless of the origin, the principles and dynamics of warfare accentuate the importance of information and deception, setting the foundation for modern concepts of information maneuver.

Although information operations gained prominence as parties engaged in extensive propaganda efforts, disinformation campaigns, and intelligence-gathering missions, using information as an element of maneuver is as old as warfare itself. The advent of the internet and digital communication further revolutionized the field, enabling rapid dissemination of information and the ability to target specific audiences with precision.

In contemporary conflicts, the concept of information maneuver has evolved and can encompass a broad range of activities, including cyber operations, electronic warfare, and psychological operations. These efforts in the information environment aim to create operational advantages by shaping the information environment, influencing perceptions, and disrupting the enemy's decision-making processes. The Marine Corps continues to adapt to these changes, seeking to define and implement strategies for maneuvering within the IE.

However, the Marine Corps has not explicitly defined IM. To successfully define IM as the Marine Corps views it, a common perspective must be established. This is accomplished through evaluation of academic literature as well as joint and service doctrine related to the topic.

2.1 Establishing Definitions

2.1.1 Information

The term information is defined in a plethora of ways. Blannin (2021) and defines information as a signal, symbol or message. Pijpers & Ducheine (2023) expand this concept stating that information, “relates to all cognitive, virtual and physical forms, such as ideas, images, binary code, words, sounds and explosions” (p. 1167). Elder & Engr (2021) call these forms realities, and that information is the virtual representations of these realities. These realities are created as humans assign meaning to the world around them. Elder expounds that these representations could be, “created, stored, and exchanged in all environments” (p. 6). Applegate (2012) expounds on Engr’s representation and labels information as the “currency of warfare in cyberspace” (p. 11). Blannin (2021) concurs with the concept of currency and comments that humans and computers either collect or disseminate information. In the mid 20th century, Norbert Wiener proposed that information is the flow of signals between complex systems, whether they are biological, mechanical, or organizational systems. (Wiener, 1961). Wiener’s definition emphasizes that with information, a message flows from one system to another. Additionally, Applegate (2012) claims information to be a tangible object within the virtual realm comparing information to key terrain or resources captured during conflict. With this concept in mind, Pijpers & Ducheine (2023) weaponize the definition of information, stating that, “information is needed as a means to act and shape the information environment to impose one’s will on others” (p. 1176). Joint Publication (JP) 3-04 argues that information is “data in context to which a receiver assigns meaning” (Joint Chiefs of Staff [JCS], 2022, p. VIII). From the Marine Corps’ standpoint, information is foundational to knowledge and is a form of power. Marine Corps Doctrinal Publication (MCDP) 8 states information is, “data that can be processed and put into an understandable form (Headquarters United States Marine Corps [HQMC], p. I-V)”. Similar to Applegate, MCDP-8 weaponizes information by labeling it an instrument of warfare spanning all domains (p. 4-3). Additionally, the Marine Corps’ (HQMC, 2024) definition of information closely aligns with the surrounding literature. MCWP (Marine Corps Warfighting Publication) 8-10 (HQMC, 2024) similarly defines information as a “representation of an idea or thought in tangible form such as a symbol, word, image, number or pattern,” and ultimately labeled information as the “raw material of communication, human understanding, and decision making” (p. 1-3). Throughout the literature, information can be defined as raw data, currency, an instrument, power, and representations of reality, all of which make up elements of the information environment.

2.1.2 The information environment

Among these themes, the Information Environment has a unique position throughout the literature. For example, Elder’s (JCS, 2014, as cited in Elder, 2021) understanding of the IE stems from Joint Publication 3-13 which states, “the information environment is the aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information... consisting of three interrelated dimensions: physical, informational, and cognitive” (p. 5-6). An important argument concerning the IE in the context of information

maneuver is emphasized by Pijpers & Ducheine (2023), who focus on how cyberspace provides access to the IE. The article similarly defines the IE by subdividing it into the physical, cognitive and virtual dimensions. Applegate (2012), while referring primarily to the virtual domain, defines the IE as an “open, borderless, virtualized environment” (p. 2). JP 3-04 takes a comprehensive approach and first defines the operational environment (OE) to provide a conceptual understanding of the IE. The OE is defined as, “the aggregated conditions, circumstances, and influences that affect the employment of forces and bear on the decisions of a commander” (JCS, 2022, p. II-2). There are factors within the OE that impact “how humans and automated systems derive meaning from, act upon, and are impacted by information” (JCS, 2022, p. II-2). The IE is then defined as “the aggregate of social, cultural, linguistic, psychological, technical, and physical factors” (JCS, 2022, p. II-2). MCDP-8 reinforces this definition by defining IE as “the global competitive space” (HQMC, 2022, p. 1-5) that exists within all the warfighting domains. Additionally, the MCWP 8-10 (HQMC, 2024) definition of the IE aligns with the cancelled joint publication 3-13 but adds that the IE is an “always-live and contested physical and cognitive maneuver space where military advantages can be gained or lost” (p 1-4). In the context of Marine Corps, the information and maneuver juxtaposition becomes meaningful in IE. For example, even the definition of IE provided by National Institute of Standards and Technology references JP 3-13. Similarly, the theme that emerges from the literature has the reliance on the joint publications to define IE. The IE frameworks provided by JP 3-04 and Pijpers include physical, mental and informational dimensions. Lastly, the IE is persistent and universal.

2.1.3 Maneuver

To conceptualize maneuvering within the IE, physical maneuvering must be explored first. Maneuver refers to the strategic movement or positioning of forces to gain a tactical advantage over an adversary. It involves actions designed to place the enemy at a disadvantage through the use of favorable positions, surprise, and flexibility (Merriam-Webster Dictionary). Elder (2021) defines maneuver warfare as, “ways to place the enemy at a disadvantage by taking up favorable positions, or else by first confronting part of the enemy’s force within a limited area to obtain an advantage over the force as a whole” (p. 3). Elder (2021) believes that the positioning of forces is the linchpin of maneuver warfare to achieve strategic goals through tactical advantages. Elder (2021) adopts existing maneuver concepts of tempo, schwerkpunkt, surprise, combined arms, flexibility, and decentralized command. Applegate (2012) mirrors Elder’s work but describes maneuver as, “the disposition of forces to conduct operations by securing positional advantages before or during combat operations,” and the “movement of troops to positions of advantage to attempt to fix or destroy enemy forces.” (p. 1). The framework that Applegate uses to define maneuver is Colonel John Boyd’s observe, orientation, decision, and action (OODA) Loop (Boyd, 1986, as cited in Applegate, 2012). While John Boyd (1987) did not address IM specifically, a key component to his OODA Loop is to outpace the adversary’s decision cycle to create advantages. Kuijt (2022), as seen in figure 1, offers Boyd’s OODA loop as a framework for IM stating the loop, “can be used as a step-by-step guide in which to conduct information manoeuvre” (p. 8-10).

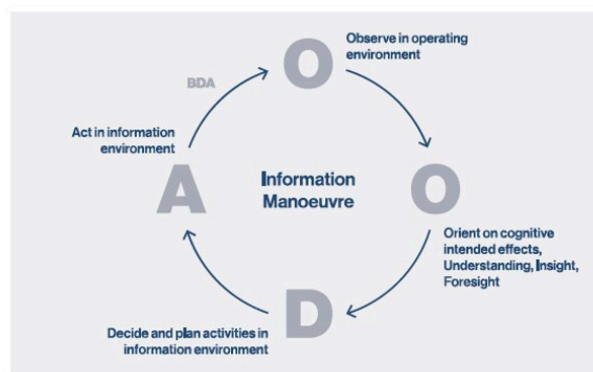


Figure 1: Integration of Information Maneuver in the OODA-Loop by Kuijt

The purpose of maneuver according to Applegate is to, “build mass, bypass strength, exploit vulnerability, gain and maintain the initiative, and exploit success to achieve a state’s tactical, operational and strategic objectives” (Applegate, 2012, p. 12). Since the release of Fleet Marine Force Manual 1 in 1989, the Marine Corps has been the champion of maneuver warfare. More recently defined in MCDP 1: Warfighting, maneuver is “taking action to generate and exploit some kind of advantage over the enemy as a means of accomplishing our objectives as effectively as possible” (HQMC, 1997, p. 1). MCDP 1 further states that maneuver should not just be thought of in spatial terms, which indicates that the concept of maneuver can go beyond physical aspects of the information

environment (HQMC, 1997). MCDP-8 stresses that information must be viewed through the lens of maneuver warfare (HQMC, 2022). The opening quotation in MCDP-8 states, “the essence of maneuver is taking action to generate and exploit some kind of advantage over the enemy as a means of accomplishing our objectives as effectively as possible” (HQMC, 2022, p. 1). MCWP 8-10 defines the maneuver warfighting function as the “employment of forces in an operational area, through movement in combination with fires and information, to achieve a positional advantage with respect to an adversary or enemy” (HQMC, 2024, p. 1-5). Similarly to Applegate, the purpose of maneuver from MCWP 8-10 is to, “create or exploit a positional advantage to enable mission accomplishment or other forms of advantage—such as superior tempo or psychological effects” (HQMC, 2024, p. 1-5). Hitherto conceptualization of maneuver has been physical; an action that is used to generate and exploit operational advantages in the physical dimension. However, since the action phase of the OODA loop is focused on the effects in physical dimension, the effects on the other three phases are not delineated in the conceptual understanding of maneuver.

2.1.4 Defining information maneuver

While most of the literature fails to delineate IM, the prior themes of maneuver and information provide the needed lens to define IM. Understanding IM can begin with understanding information warfare (IW) which is, “any action to deny, exploit, corrupt, or destroy the enemy’s information and its functions; protecting ourselves against those actions and exploiting our own military information functions” (Widnall & Fogelman, 1997). Blannin (2021) synthesizes the definition of IW to mean, “the full gamut of techniques whereby information is employed to gain a competitive advantage in a conflict or dispute” (p. 91). From previously established definitions, Blannin defines IM but labels it IW. The framework that Blannin (2021) proposes to condense IW includes four strategies: degradation, corruption, denial, and subversion. These four actionable strategies correlate closely to Widnall & Fogelman’s definition of IW which further illustrates how IW is synonymous with IM. Elder (2021) gravitates towards Kujit’s maneuver framework and defines IM as the employment of, “information capabilities in multiple domains to create virtual representations that a sender uses to influence the receiver’s perception of reality and therefore the receiver’s behavior” (p. 6). This illustrates a heavy focus on the cognitive dimension when conducting information maneuver, which aligns with the cognitive nature of the first three tenets of the OODA loop.

Pijpers & Ducheine (2023) state “the essence of maneuvering in the information environment is to gain a competitive advantage over audiences by using information as a source to assess and understand actors and their environment, to decide and to engage their information environment, and to use information as an instrument to influence the cognition of those audiences, to affect the deliberate understanding and autonomous decision-making process of targeted audiences” (p. 1169). As illustrated by Figure 2, Pijpers & Ducheine (2023) framework to achieve these desired effects within the IE is based off of Boyd’s OODA Loop. Within the cognitive, virtual and physical dimensions, maneuvering effectively within the IE revolves around observing, understanding, deciding and acting faster than the enemy (Pijpers & Ducheine, 2023).

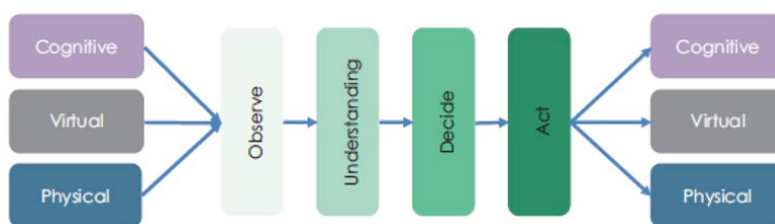


Figure 2: Information Maneuver by Pijpers & Ducheine

Acting on information is IM, as he claims, “using information in any cognitive, virtual, or physical form to shape the operational environment of other actors advantageously, but moreover to use information as a weapon of influence—concepts that border deception, propaganda, or covert action” (Pijpers & Ducheine, 2023, p. 1166). They point out that while information or intelligence feed this cycle, IM is distinct in that its application creates military power or advantage (Pijpers, 2023). Similarly, Applegate (2012) defines cyber maneuver as the “methods and processes employed to attack and defend information resources...as they are undertaken to give one actor a competitive advantage over another” (p. 2). These advantages are achieved through Applegate’s (2012) six tenants of cyber maneuver: capture, disrupt, deny, degrade, destroy or manipulate.

2.2 Joint and Service Perspectives

JP 3-04 states, “operations in the information environment, the art of maneuvering in the information environment, is conducted to enhance the effects of the inherent informational aspects of the movement and maneuver of forces” (JCS, 2022, p. VII-6). The joint publication refers to OIE as either the supporting effort or main effort that, “provides commanders with a decisive advantage over adversaries by helping to maintain the credibility and legitimacy of joint force actions, preserving the joint force will to fight, maintaining situational understanding, and keeping the joint force free of prohibitive interference due to cyberspace or EMS activity” (JCS, 2022, p. VII-1). Additionally, three objectives of the information warfighting function are presented: understand the OE, use information to support human or automated decision making, and leverage information (JCS, 2022). Bottom line, OIE are closely integrated “military actions” within the information warfighting function that “leverage information for the purpose of affecting the will, awareness, and understanding of adversaries” (JCS, 2022, p. VII-1).

The MCWP 8-10 states, “the purpose of the information warfighting function is to create and exploit information advantages” (HQMC, 2024, p. 1-6). Additionally, “the information warfighting function includes the material and actions taken to generate, preserve, deny and project informational power to increase and protect competitive advantage... within all domains” (HQMC, 2024, p. 1-6). These four information function activities, or actions, are considered at the foundation of every Marine Corps unit as the goal of these functions is “to create and exploit information advantages that support accomplishing mission objectives and imposing our will over an opponent” (HQMC, 2024, p. 1-7). MCDP 8 reinforces the concept of viewing information with a maneuver mindset. An “information advantage is an exploitable condition resulting from one actor’s ability to generate, preserve, deny and project information more effectively than another” (HQMC, 2022, p. 1-2). MCDP-8 (USMC,2022) identifies that the information warfighting function can be applied “to create and exploit information advantages” (1-6). Lieutenant General Glavy (2022) in his article to the Marine Corps Gazette, aligns with MCDP-8’s application of the four function activities within the warfighting function (p. 9). Glavy’s information advantage pyramid, seen in figure 3, provides a framework for how to generate advantages within the IE. Maneuver concepts within Glavy’s framework include his tenants of placement and access (Glavy, 2022, p. 10).

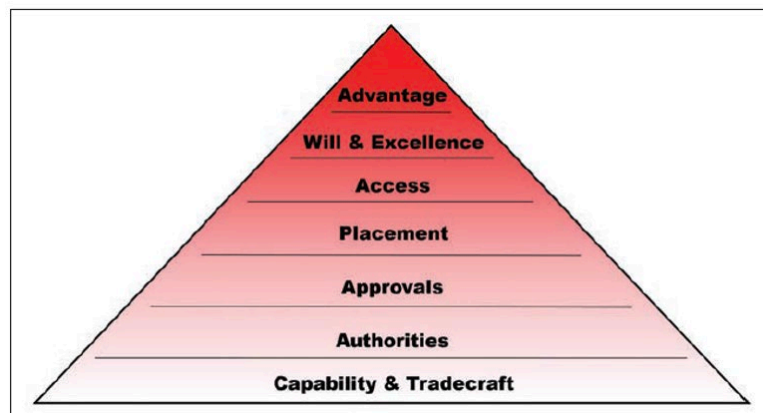


Figure 3: The Information Advantage Pyramid

2.3 Establishing Relationships

The dynamics in the IE pose challenging questions. For example, is IM a facet of warfare that only trained professionals are expected to execute, or does the concept permeate warfighting in a broader way? Furthermore, is it possible to formalize a framework that can help to categorize intentional and inadvertent activities in IE as maneuver or not.

Information Maneuver means to create an advantage over an adversary, which can be supported by using the Ross’ definition of an information advantage (IA), adopted from the US Army’s working definition. IA is “a condition when a force holds the initiative in terms of relevant actor behavior, situational understanding, and decision-making using all military capabilities through the conduct of Information Advantage Activities” (Ross, 2021, p. 63). An information advantage activity is “the employment of capabilities to enable decision-making, protect friendly information, inform and educate domestic audiences, inform and influence international audiences, and conduct information warfare” (Ross, 2021, p. 63). Recently, JP 3-04 removed the term ‘information related capability’ from the DOD Dictionary because all actions create effects within the IE.

Similarly, the use of the term/concept information maneuver is nascent, and the scope of its use is not widely understood or accepted. The IA perspective highlights the broad scope of activities that can be used for intentional IM. This viewpoint is supported by JP 3-04. Also highlighted by Ross, and as shown in Figure 4, an IA can be conducted across all warfighting functions. It follows that the use of IM, regardless of domain or warfighting function, can create a position of advantage or disadvantage.

Despite an inherent understanding among Marines that the goal of maneuver within any environment is to create an advantage over an adversary, due to the complicated nature of IE, Marines at all levels should conceptually understand the relationship between IM, the seven warfighting functions, and the IE, as maneuver can manifest itself in many forms within the IE. IM in the Marine Corps context, seeks to outsmart adversaries by controlling and leveraging information, attaining mission success by influencing enemy decision making. To professionalize this effort, the 17XX IM Occupational Field (OCC Field) was created, focusing on cyberspace operations, electromagnetic spectrum operations, civil affairs, and psychological operations (U.S. Marine Corps, 2020). These four pillars indicate the IM relationship between all domains and warfighting functions. The 17XX OCC field supports and relates the vital Information Warfighting Function, highlighting the importance of information in modern military operations. While having Marines specifically trained in IM opens the door to use specific avenues to create effects, the work of Ross in combination with updates presented in JP 3-04 highlights that all action taken across the battlefield will create effects in the IE, potentially leading to the generation or loss of an advantage. Therefore, to avoid annihilating IM effects in IE, information warfighting functions and IM dynamics must be conceptually well understood.

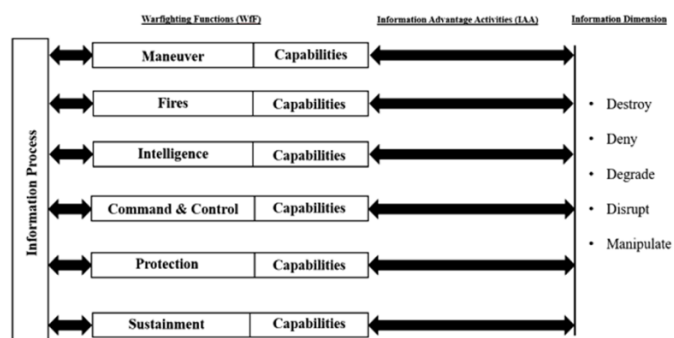


Figure 4: Ross' illustration of IAA impact throughout Warfighting Functions

3. Results and Discussion

Information maneuver is largely undefined throughout the literature. However, one strong conclusion of the systemic literature review is that IM could be any actionable decision cycle taken within the IE used to generate advantages within any domain. Moreover, the Marine Corps' implicit framework of IM consists of actions to generate, preserve, deny, and project information, indicates overlap with the warfighting functions such as movement and maneuver, intelligence, fires, sustainment, command and control, and protection. These six warfighting functions reveal that each aim to create a strategic and tactical advantage, albeit through different means. For instance, movement and maneuver achieve positional advantage, while fires focus on the physical destruction of enemy capabilities. Intelligence gathers and processes information to inform decisions, akin to how the information warfighting function exploits data to influence cognitive perceptions. Sustainment ensures operational endurance, command and control provide leadership and direction, and protection safeguards forces and assets. IM should be synergized with these traditional warfighting functions. For example, information operations can support movement and maneuver by disrupting enemy command and control systems, thereby creating windows of opportunity for physical maneuvers. Similarly, fires can be guided by intelligence derived from information warfare activities, ensuring precision targeting and minimizing collateral damage. The command-and-control structure can leverage real-time information to make informed decisions, enhancing situational awareness and responsiveness. By embedding IM within the broader warfighting strategy, the Marine Corps can enhance operational effectiveness. This integration allows for a multi-dimensional approach where physical actions are complemented by cognitive and informational tactics, creating a comprehensive strategy that maximizes the impact on the adversary across all domains.

The definition of OIE does not associate OIE with a specific unit or skillset but implicitly acknowledges that OIE can be conducted regardless of a unit's primary mission. While JP 3-04 does not define IM, it does define IW as "the range of offensive and defensive efforts that use information across the competition continuum to exploit

the information environment against adversaries, to inform public opinion, and to compel decision makers to take certain actions” (JCS, 2022, p. III-25). Aside from this passage, IW as a concept is absent from joint doctrine because joint doctrine only recognizes two types of warfare: traditional and irregular. It is worth noting that despite this, Navy and Marine Corps personnel are trained in IW, leading to confusion in doctrinal terminology. JP 3-04 states that the “US military contributes to information warfare ... by conducting operations in the information environment” (JCS, 2022, p. III-25). The correlation between IM and the prevalent use of the term IW outside of the DOD is important to make as further research into IM should consider the global academic work into the analogous topic of IW. At its heart, just like the other two types of warfare, information warfare seeks to create an advantageous position over an adversary and relates directly back to the concept of maneuver.

Though lacking a clear definition, IM is a skillset Marines are expected to execute. Given this, a clear definition should exist because it will demystify the conceptualization of the information warfighting function. The Marine Corps, through doctrine and trained specialists, has developed its own conceptual understanding to support the operationalization of maneuver in the IE. While the Marine Corps has trained IM specialist to create information advantages, relative advantages or disadvantages may be attained in the execution of each warfighting function, whether through intentional or inadvertent action. In the execution of each of these functions exists the opportunity to generate, preserve, project or deny information, as seen in MCWP 8-10. The idea that a capability can be employed not just by specialists but across warfighting functions during mission execution is a key theme found throughout the literature. Maneuver in the IE is pervasive and nearly inherent in any action taken across the range of military operations.

Despite similarities, there are differences between physical maneuver and IM. The tempo and standoff with which effects can be created in the IE are salient examples. These dynamics of the IE are why actors can shape perception globally through targeted messaging campaigns without leaving home. Maneuver in this space also presents an opportunity for actors to create tangible effects with far less risk of escalating conflict to open war (Applegate, 2012). Effects can also be far harder to predict in the IE. With traditional maneuver measures of effectiveness are comparatively straight forward. When maneuvering in the IE, specifically in the cognitive domain, effects can be further reaching, more difficult to predict and ultimately assess. For example, it took nearly four years after the maneuver of a US information campaign in the Philippines for Reuters World News to report a story that created significant domestic effects (Bing & Schectman, 2024). Despite the identification of the actors in this case, it is typically far harder to attribute an information operation to the responsible party.

4. Conclusions

After examining IM through the lens of information, the IE, and maneuver, the Marine Corps’ framework for IM includes four tenants: generate, preserve, deny, and project information. How these actions are currently implemented in the fleet requires further study through personal interviews, observation, and surveys. Additionally, understanding how our allied partners and sister services understand IM is also paramount. IM must be defined for Marines so they can integrate with sister services and allies in the future fight. Furthermore, academic research should be leveraged by the Marine Corps to codify definitions and responsibilities to effectively implement IM in an evolving environment.

Despite a clear correlation between physical maneuver and IM, there are notable differences such as the range and speed with which effects can be created. The most meticulously planned IM may have far reaching effects (spatial and temporal) which are difficult to predict or quantify. The IE is continuously evolving, and one the Marine Corps is learning to operate in while simultaneously developing doctrine and reorganizing the force to meet this challenge. This is an ongoing process, and the maneuver warfare mindset is as relevant today as ever but requires adaptation for use in the IE.

MCDP-8 (HQMC, 2022) states that all Marines must leverage information to impose our will on the adversary at the decisive point (p. 1-2). If this is the case, Marines must be armed with foundational knowledge and deserve clarity. As Sun Tzu (Tzu, 2014) said, “maneuvering with an army is advantageous; with an undisciplined multitude, most dangerous” (p. 25).

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