

# Modern Day Kobayashi Maru

The only way to win social media is to cheat

## Introduction

Use of social media continues to rise in the United States and the world. It is difficult to argue against the popularity and influence of social media (Pew Research & Inquiries, 2021b), but there is a general lack of clarity regarding the overall impact of social media (Pew Research & Inquiries, 2020a). Social media strategies for deterrence must be assessed to ensure the desired end state is achieved. The United States military strategy for use of social media begins with the joint publication (Joint Publication, JP 3-61), unifying all elements of the force under a single conceptual framework. Small changes in the joint publication can lead to large changes over time. US operations within the digital realm are guided by the Cyberspace Operations Joint Publication (JP 3-12) and the Information Operations Joint Publication (JP 3-13). Social media exists within the cyberspace domain and is designated a function of a service or COCOM's Public Affairs (PA) office. Cyberspace is the substrate for social media and operates on a collection of social networking sites (SNS) (ex: Facebook, Twitter). Each SNS operates within a global shared infrastructure mediated by the associated private company. These unique attributes of social media create an environment that could be described as a "psychological" domain (Ajir & Vailliant, 2018) and requires an innovative concept for effective operations. The JP 3-61 lists four assumptions for the Department of Defense (DoD) to engage social media: 1) it is efficient 2) it is unmediated 3) it provides actionable feedback and 4) it promotes trust. Our research critically assesses the validity of these four assumptions as applied to the limited environment of social media within the larger cyberspace domain constrained by the unique considerations of shared infrastructure, global reach, and private ownership. Our analysis provides unique implications for USSTRATCOM strategic messaging by analyzing/assessing

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the validity of the publication. Understanding the potential risks and alternate solutions can provide USSTRATCOM with realistic expectations within the social media environment.

## Literature Review

This research seeks to apply critical analysis to doctrinal assumptions pertaining to social media engagement of the DoD. Joint publication develops the concept of cyberspace within the Cyberspace Operations publication (JP 3-12). Information operations are expanded and refined in the Information Operations publication (JP 3-13). Social media is defined in appendix F of the Public Affairs publication (JP 3-61).

The efficiency of social media is approached via the two premises provided by joint publication, the reach and simultaneity of social media communication. Global reach is addressed by considering countries that withhold proper internet access from the citizenry. Digital authoritarian regimes (Sherman, 2021) are quantified to a degree by projects like the Freedom House “Freedom of the Net” score where countries like China and Russia got very low scores and were designated as “not free” (*China*, 2020; *Russia*, 2020). Research has been performed on the possibility of “universal” social media (Christensen et al., 2015), but few discuss the restricted impact of social media in a modern world. The question is often “how”, but rarely “should”, when considering social media.

Technical limitations of SNS’s are not often published in academic journals. Research has provided support for the inherent complexity of social network sites (Silberstein et al., 2010) which is corroborated by technical infrastructure details made available by social media networks (*The Infrastructure Behind Twitter*, 2017).

Research seems to acknowledge social media is not unmediated. Censorship is a common manifestation of mediation and is viewed more as a tool to be leveraged than an end

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to be avoided. Censorship, in its various forms, has been shown to effectively repress populations (Asal & Brown, 2020) and control user emotions (Hallinan et al., 2019). The prospect of restricting and censoring content on social media has been characterized as a balancing act of “fake news” and freedom of speech (*Social Media Weaponization*, 2020). Some research goes so far as to posit that mediation is the solution to the problem of disinformation (Pherson et al., 2021).

Russia’s skill with creating and delivering disinformation is well documented (Ajir & Vailliant, 2018; Fitzgerald & Brantly, 2017; *Social Media Weaponization*, 2020) and the use of trolls and bots is posed as an existential threat to democracy (Ajir & Vailliant, 2018; Prier, 2017). The goals and tactics of propaganda and disinformation are believed to be mostly unchanged (Fitzgerald & Brantly, 2017) and several authors assert the need for truth on social media (Pherson et al., 2021; Prier, 2017; *Social Media Weaponization*, 2020). The elusiveness of truth and trust is supported by research on the effects of social media on people. People seem to be more lazy than opinionated (Pennycook & Rand, 2019) and overall not very likely to be affected by updated messaging on social media (Chan et al., 2017; Ecker et al., 2014, 2017; Thorson, 2016). Furthermore, the manipulative powers of social media are supported by multiple studies (Eslami et al., 2015; Hallinan et al., 2019; Hayes & Reineke, 2007).

Deterrence on social media has been discussed with a focus on Schelling’s work, *Arms and Influence*, (Chersicla, 2019; Schelling, 1966). Some have discussed the flexible nature of threat narratives (Ciovacco, 2020) and others have provided frameworks for assessing the viability of social media for coercion (Borghard & Lonergan, 2017; Papakyriakopoulos, 2021). Overall, there is little, if any, research addressing the implications for deterrence arising from the state of modern social media as conveyed by events in the last few years.

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## Concepts

Social media exists on the digital substrate provided by the internet otherwise known as cyberspace. The DoD defines cyberspace as a global domain within the information environment consisting of the interdependent network of information technology infrastructures and resident data, including the internet, telecommunications networks, computer systems, and embedded processors and controllers. Operations within cyberspace are described using a layered model with three interrelated layers: physical networks, logical networks, and cyber-personas.

Social media is defined as “a variety of sites through which people, enabled by digital communication technologies, connect with one another to create content, share information, and engage in conversations” (JP 3-61 Appendix F). Social media can be considered the phenomenon emerging because of the interactions within and between SNS's. A social media site is a web-based application supporting the existence of a social network. We define social networks as objects consisting of a finite set or sets of actors and the relations or relations defined on them where relational information is a critical and defining feature (S. Wasserman & Faust, 1994).

We draw a clear distinction between the concepts, “social network” and “social network site”. Social network sites are conceived as digital sites enabling the creation of relational information in support of the abstract concept of social network. Social network sites are necessary for the existence of social networks in the context of social media, but are not sufficient to be treated as equal to social media in a holistic sense. Social network sites are typically characterized by private ownership, global reach, and impartiality (Communications Decency Act of 1996 Section 230 exemption).

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To discuss efficiency, we address the fact there are countries where citizens are prohibited from accessing the internet in the same way as the rest of the world. We frame the analysis using the concept of digital authoritarianism which is defined as the use of digital technologies to enhance or enable authoritarian governance using practices such as pervasive internet surveillance and the exercise of tight control over online information flows within a country's borders. Digital authoritarianism has implications for US national security characterized by three primary avenues of exploit (Sherman, 2021):

1. Digital authoritarianism allows authoritarian regimes to consolidate power
2. Digital authoritarianism may encourage... the global diffusion of tools and knowledge for digital surveillance”
3. Digital authoritarianism could potentially insulate certain countries from foreign cyber attacks

China and Russia are prime examples of digital authoritarian regimes.

We employ Michael Keene's extended definition of deterrence: the prevention or inhibition of action brought about by fear of the consequences and a state of mind brought about by the credible threat of unacceptable counteraction. It assumes and requires rational decision makers (Chersicla, 2019). Furthermore, we consider deterrence to be predicated on effective deterrent threats that are capable, calculated, communicated, and credible. Deterrence is successful when nothing happens and can be viewed as a reciprocal to coercion (Borghard & Lonergan, 2017). We acknowledge that “uncertainty over causation” (Freedman, 2009) combined with the inherent nature of what has not happened makes deterrence difficult to measure.

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## Research Design

The goal is to develop a shared understanding of the doctrinal assumptions and provide a context for social media engagement using logical argument constructions informed by real-world events and academic research. Our research is qualitative in nature with an interpretive design with an analytical organization (McNabb, 2010) - each doctrinal assumption is addressed completely. Data was collected from academic research papers, court documents, government reports, official blogs, and interviews with subject matter experts from USSTRATCOM. We formalized the doctrinal assumptions using logic in order to make them amenable to analysis and then assessed the consistency and soundness when combined with the real-world data described above. Generally, an assumption is shown to be invalid when it does not follow logically from the existent circumstances. After establishing the context in which social media should be viewed, we then describe and analyze social media engagement at USSTRATCOM informed by personnel interviews. The analysis is applied to the specific circumstance of USSTRATCOM and implications provided.

## Analysis

Our analysis has two primary goals: 1) assess the validity of the four assumptions within joint doctrine for social media engagement (see Joint Publication 3-61, Appendix F, 19 August 16), 2) apply our analysis to USSTRATCOM. To accomplish the first goal, we will leverage concepts from various disciplines such as logic, information theory, statistics, and computer science to establish a rigorous framework on which definitive conclusions can be built using real-world events and facts. The validity analysis will then be applied to USSTRATCOM. We expect to answer the question, "Is joint doctrine still valid in the context of social media as it exists today?" In applying our results to USSTRATCOM, our intention is to improve

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understanding of the social media operating environment. It should be noted our intent is not to take issue with doctrine in a superficial sense with pedantic rigor. Rather, we will interpret the purpose of doctrine by analyzing the assumptions with the provided justification. For example, we have no intention to argue the meaning of “efficient”, but will analyze in detail the premises from which the attribute, “efficient”, is deduced.

## Efficiency

“**It is efficient.** Anything you communicate in social media is sent in an instant and is then available anywhere in the world for access.” (JP 3-61)

Joint doctrine asserts “anything you communicate in social media is sent in an instant and is then available anywhere in the world for access” supporting the assertion social media is efficient. The efficiency claim can be restated as a syllogism, “if social media is instantaneous and available to everyone across the globe, social media is efficient”. Working within the explanation of the joint publication, to refute the conclusion social media is efficient, one need only refute one or both of the premises social media communication is not instantaneous and/or is not available to every person in the world.

## Near Real-time

An understanding of 4-dimensional space-time should preclude the notion of any two events being truly instantaneous. For the purposes of this analysis, we acknowledge the limitations of physical reality and interpret the concept of “instant communication” (or “real-time communication” as it is more commonly referred to) within social media in more a qualitative term. Even if we accept the limits imposed by physics, should we accept that communications in

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social media are instant in the same sense that talking on a phone is instant? Communication within social media is provided by private social network sites. We cannot address every social network site in existence, but we do not need to. Addressing the social network sites used by USSTRATCOM, will suffice. It is difficult to argue “social media communication is instant” when in fact an appreciable percent of social media users are provided with less-than-real-time communication. Twitter, according to reports (*Digital Trends 2021*, 2021) has an audience of more than 350 million people. To reach hundreds of millions of people is no easy task and we argue such a feat is a modern engineering marvel. It should not be difficult to understand Twitter is built on dozens of technologies, employs hundreds of engineers and runs on a complicated infrastructure. Engineering is not magic and for every benefit there is always a cost. Even Twitter acknowledges that “everything has pros and cons and needs to be adopted with a sense of realism” (*The Infrastructure Behind Twitter*, 2017).

The scale of Twitter’s user base (similar to other social network sites) is only part of the picture. As a private social network site, Twitter provides users with the ability to follow the activity of other users. This capability makes Twitter (and almost all other private social network sites) a “follows application” (Silberstein et al., 2010). A user’s Twitter feed is a listing of the latest posts from all the users followed by that user. Presenting a user’s feed becomes exponentially difficult when popular users follow or comment on other popular users. The point is to assume real-time communications for all communications across all users is nearly impossible - this is why it is more common to refer to the capabilities of follow applications as “near real-time” (Silberstein et al., 2010). Talking on a telephone is real-time, texting on a cellphone is real-time, but Twitter is not real-time. Therefore, communications where social media is conceptualized as a collection of social network sites and which social media is created on, are not real-time or instant.



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## Global Audience with Notable Exceptions

Data shows about half of the global population use the internet (*Digital Trends 2021, 2021*). The population of social media users is a subpopulation within the population of people using the internet which further attenuates the reach of social media. There is some uncertainty about what the actual percentages are, but no data supports the claim that 100% of the global population are on the internet actively using social media.

Even if one assumes the existence of “universal social media” (Christensen et al., 2015) is available to all countries around the globe, social media is not available in digital authoritarian regimes like China, Russia, and North Korea which exercise “...tight control over online information flows” (Sherman, 2021) within their borders. Employing Twitter as an example, China and Russia are not included in the top 20 countries ranked by audience size (*Digital Trends 2021, 2021*) - which should be impossible considering each country’s relevant attributes. Russia and China were given internet freedom scores tantamount to being “not free” by Freedom House (*China, 2020; Russia, 2020*) and North Korea did not even get analyzed. The point is the reach of social media, although impressive and greater than anything before it, is most certainly not “available anywhere in the world for access” (JP 3-61).

## Mediation

“**It is unmediated.** There is no gatekeeper, meaning the message will appear to any audience who may access it. Social media users must keep in mind messages might be misinterpreted.” (JP 3-61)

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JP 3-61 posits social media has no gatekeeper and any message on social media will “appear to any audience who may access it” (JP 3-61). Applying the concepts developed in this paper, we can re-frame this assumption as a simple statement of propositional logic, “all social network sites are unmediated implies any message on any social network site will appear to any audience who may access it”. This formalization excludes unintentional misinterpretation and for the sake of argument makes the conservative assumption messages on social media are received and interpreted in accordance with the associated sender’s intent by those accessing them. Furthermore, we acknowledge the concept of social media, distinct from the substrate of social network sites it operates on, is bound by the reality it is easily conflated with the imminent social network sites - namely, Facebook, Twitter, and YouTube (Instagram excluded since it is owned by Facebook).

The unmediated nature of social media as described by the joint publication refers implicitly to content provided on social network sites. The question becomes, “Do social network sites filter, censor, or otherwise restrict content?”. We need not consider every social network site and can further refine our question to “Do *any* social network sites filter, censor, or otherwise restrict content?”. By framing the question in concrete terms, we enable analysis and provide a means for assessing the consistency of our logical formalization. We will focus our attention on social network sites used by USSTRATCOM, Facebook and Twitter.

If there exists a counterexample (Velleman, 2006) to the statement, “all social network sites are unmediated”, we would be able to leverage a modus tollens style argument, “If A implies B and not B, then not A”, where A and B are propositional statements. There are essentially two methods any social network site can employ to prevent messages from appearing to any “audience that may access” them: 1) prevent access to the content of any user by completely removing the associated user from the site (ban) and 2) limit access to content

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that shares some number of characteristics (censor). Facebook, Twitter, and YouTube can provide examples and perform both methods.

The most visible example of social network sites mediating content via banning (arguably in all of history) is when Twitter permanently banned the sitting President of the United States, Donald Trump, in January 2021. Facebook also banned the former president, and his content is no longer available on Twitter or Facebook. The authority to ban any user at any time punctuates the true nature of social media. Supreme Court Justice Thomas said “it seems rather odd to say that something is a government forum when a private company has unrestricted authority to do away with it.” (*Joseph R. Biden, Jr., President of the United States, et al. V. Knight First Amendment Institute at Columbia University, et al.*, 2021). Banning the sitting American President is not the only example of times when social network sites banned public figures (Business, 2021), but it is hard to think of an example more clearly underscores the “unrestricted authority” of the private sector entities who run social network sites.

Between banning users and censoring user content, censorship is arguably the more versatile of the two. Censorship can be applied to parts of individual messages, entire populations of users and everything in between. Facebook has a history of filtering user content with the explicit goal of influencing user behavior (Eslami et al., 2015; Hallinan et al., 2019). Social network sites need not interfere with user content directly in order to enact effective censorship. The algorithms used by social network sites are the explicit property of the private sector entities who own the sites. These algorithms can capably amplify or mute any message or messages on any site and for any user. Motives aside, it is a widely held belief social network sites employ their algorithms to shape and censor the messaging made available on their sites (*Algorithms and Amplification*, 2021; Eslami et al., 2015) resulting in numerous legal cases

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*(Anna Paulina Luna for Congress v. FEC alleges failure to act on complaint, n.d.; Judicial Watch, Inc. V. Iowa Secretary of State, 2020).*

It is impossible to reconcile the idea that social media is unmediated (JP 3-61) with the reality that the companies who own the sites on which social media is built have unmitigated authority to mediate anything at will. The authority of social network sites to mediate content is well documented and has even been offered as an effective (Asal & Brown, 2020) solution to the increasing weaponization of social media (*Social Media Weaponization, 2020*).

## Feedback

**“It provides feedback.** Social media provides actionable feedback.” (JP 3-61)

It is a fact social media provides feedback. It is also a fact the feedback provided by social media can be used to rationalize action and is therefore actionable. When one uses the statement, “social media provides actionable feedback” (JP 3-61), to support engaging with social media, the implication is actionable feedback is a consequence of engaging with social media. The existence of “actionable feedback” should not be used to justify anything without connecting cause and effect. Even events that appear to connect social media feedback with real-world causes like the social media dynamics observed during Israel’s 2012 Operation Pillar of Defense operation (Chersicla, 2019), should not be taken as absolute proof of correlation. After all, “association does not necessarily imply causation” (L. Wasserman, 2004).

Attributing cause and effect on social media is inherently difficult. Suppose an organization engages with social media via Twitter, like USSTRATCOM does. Over multiple years of operation, the organization presumably improved at engaging on social media and gained followers every year. The organization might ask, “are more followers good?” or “does

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our number of followers correlate with success?” Generally, having more followers means increased audience size and greater message efficacy. Even if one assumes the number of followers can be used as a measure of success, the difficult step is determining how to achieve success with purpose. Regardless of metric (ex: followers, retweets) purposefully reproducing success requires connecting actions to feedback and feedback to success.

Suppose one assumed all the necessary implications in order to connect a given metric with mission success. In a world with myriad documented cases on disinformation, bots, and trolls (Ajir & Vailliant, 2018; Fitzgerald & Brantly, 2017; Piazza, 2021; Prier, 2017; Varol et al., 2017), verifying a metric actually represents the actual target audience is a non-trivial endeavor (L. Wasserman, 2004). Preventing the spread of disinformation, identifying fake (i.e. bot) social network accounts (*What's Being Done to Fight Disinformation Online*, 2019), and refining truth amidst the deluge of data created by social media are all incredibly difficult tasks and should not be underestimated.

## Trust

**“It promotes trust.** Responsively exchanging information builds a relationship, and in return trust with our audience. By listening, sharing and engaging with others in social media, DoD has the unique opportunity to assume a leading role in discussions about and relevant issues regarding the joint force.” (JP 3-61)

It should be relatively easy to accept the concept that not every information exchange builds trust. Large-scale campaigns can fail to understand the target audience (Prier, 2017), posts can be ill-received, (Pawlyk, 2020), and entire accounts closed due to operational security concerns (Myers, 2018). The prevalence of disinformation on social media erodes public trust in

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social media and research refutes the belief truth is enough to shape public opinion (Pennycook et al., 2018) and reveals a truthful message may fail not because of the sender, but because of the receiver (Pennycook & Rand, 2019). Truth is not the only variable in play when considering trust. Bias (Behrouzian, 2018; Ecker et al., 2014), culture (Ng et al., 2019), and circumstance (Coviello et al., 2014), are some of the many aspects playing an important and sometimes hidden role in how trust is developed. Although admirable, it is not enough “to just push out with the truth” (*U.S. Strategic Command Deterrence Symposium Media Roundtable, 2018*).

In addition to the inherent difficulty of developing and quantifying trust, research shows social media has several attributes that make it unamendable to developing trust. People are not easily swayed by retractions or corrections (Chan et al., 2017; Ecker et al., 2017), and are strongly influenced by pervasive disinformation (Thorson, 2016). Perhaps this explains why most Americans believe social media has a negative impact on their life (Pew Research & Inquiries, 2020a).

## Case Study - USSTRATCOM

USSTRATCOM “deters strategic attack and employs forces, as directed, to guarantee the security of our nation and our allies” (*U.S. Strategic Command, 2021*). Joint publication (JP 3-16) designates social media a function of Public Affairs (PA) (*Public Affairs, 2015*) and augments the publication with its communications strategy (*USSTRATCOM Communications Strategy 2020 - 2021, 2020*). The strategy documents the “public information playbook”, vision tactics, technique, and procedures for how the command utilizes social media to accomplish its mission (*USSTRATCOM Communications Strategy 2020 - 2021, 2020*).

Interviews conducted with the command PA personnel identified their two most significant risks to be disinformation undercutting their messaging and the lack of control of how

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their messages are delivered. To mitigate these risks, the PA office routinely receives/responds to news media queries on social media posts and sends messages via other media outlets.

Good relations with news outlets is of paramount importance to the PA office. When responding to media queries and addressing message reception, the PA office strives to avoid jargon and instead employs simple language easily understood by most people. They noted they hardly ever please everyone (ex: PA personnel stated academia sometimes accuse USSTRATCOM of not understanding the issues because the command PA office used simple language that failed to display an understanding of the complex topics under discussion). If their mitigations were to fail or if social media (Twitter) was to become unavailable to the command (i.e USSTRATCOM was censored), the PA office stated they would leverage other government departments, federal agencies, and NATO allies to get messaging out, contact news outlets directly, and use the their homepage as a blog - all with the belief the reach of deterrence messages and narratives would be severely attenuated.

Day to day social media operations proceed IAW the communications strategy and are handled by two personnel. Twitter is the primary focus and an engagement cycle encompasses the following steps: (1) Communication objectives are received from all of the directorates. (2) PA makes an internal decision to act or not act. (3) PA presents their decision at a working group attended by all directorates. The working group performs a red team analysis of the PA decision and provides recommendations to formulate an output. (4) PA takes the recommendations and crafts a tweet or tweets. (5) PA approves the message in accordance with the approved plan and sends the tweet(s) via the official USSTRATCOM Twitter account. (6) Usually by the end of the same day, PA analyzes the effect of the message by monitoring select Twitter accounts. Only verified accounts identified by blue checks (Twitter informs the public if an account of interest is authentic) are considered. The communications strategy lists

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several tactics for audience building including using hashtags, leveraging trends, and news jacking - sometimes attempting to be fun and humorous - all in support of USSTRATCOM's vision, intent, mission, and Global Campaign Plan.

PA performs an annual digital communications analysis that includes social media and the USSTRATCOM homepage on the public internet. According to the PA personnel, the annual analysis takes about one month to compile. The annual assessments focus on growth, reach and engagement and provide descriptive statistics in support of each of these topics. The analysis is performed by one person with a background in communications and public affairs. The USSTRATCOM PA office is on the "low end of social media support" but is not the lowest in the DoD. The PA office has no assigned technical analysts and would benefit greatly by adding operations research analyst, 1515 series personnel to support this analysis.

USSTRATCOM PA personnel are seasoned users of social media. They know not to interfere when messaging goes "off the rails", and view Twitter as a volatile medium encapsulated by the characterization of "highest dissemination, highest risk". They choose tools based on detailed analysis of their efficacy and developed an understanding for how different social network sites should be utilized. USSTRATCOM PA knows Facebook limits the effectiveness of tools not developed by Facebook, and believes going viral on Instagram does not help the mission. USSTRATCOM PA told us they have thought for years the joint publication should be changed and more applicable to the way social media operates today. They consider our research a starting point for change to be recognized and facilitate updates to the publication.

It is easy to see the influence of joint doctrine in USSTRATCOM PA operations. Providing annual descriptive statistics, encouraging one-on-one engagements, being fun and humorous, and making comments that generate attention are all examples of tactics inline with



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the assumptions of joint doctrine. In light of the prevailing perception that social media is “one of the most important places to exchange information” (*Packingham v. North Carolina* (06/19/2017), 2017), it is hard to justify the PA personnel are properly staffed to succeed in a reactive sense and even harder for them to excel proactively.

## Conclusion

Our analysis shows social media is not as efficient as it appears to be. Social media’s reach is amazing, but not omnipresent or real time. Social media is a mediated space with its own set of rules that may not align with USSTRATCOM or DoD strategic interests. Our adversaries are extremely effective at promoting chaos on social media - increasing the social entropy of social media. In a world with trolls, fake news, disinformation, and corporate control it is more difficult than ever to communicate truth and measure effectiveness. This is not to say all is lost. There are actions that can be taken, but only after a realistic understanding of social media is developed. The tactics of the USSTRATCOM/DoD are not those of our adversaries. If we are to compete, we must accept our limitations, pick battles we have a chance at winning and must take aim at the war of tomorrow, not just skirmishes of today. When future Starfleet (“Starfleet Academy,” 2021) officers were trained to accept “no win” (“No-Win Situation,” 2021) scenarios using the Kobayashi Maru simulation (“*Kobayashi Maru*,” 2021), we too must accept the reality of the social media environment. We must not cheat with bots and propaganda and not eschew free speech for censorship. We must rethink our social media engagement strategy and ponder how we can shape a future landscape to preclude a “no win” scenario.

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## Recommendations

- **Update doctrine and policy.** Reconsider the assumptions of JP 3-16 appendix F. Reframe strategy in context of modern day social media. Long-term goal should be to update joint doctrine. Implement localized instructions until joint doctrine is changed. Update the USSTRATCOM strategic communications plan to better align with social media as conveyed in this paper. Change PA tactics, techniques, and procedures to account for JP 3-61 appendix F shortfalls until the publication is updated.
- **Upgrade and federate social media analysis.** Augment PA analysis with technical expertise (Operations Research Analysts, code 1515) who can support the development of metrics to improve understanding of the social media environment. Furthermore, these technical experts could assist in performance of efficient, effective review of current PA data and provide analysis with additional tools to ensure accurate results with rigor. PA personnel can provide data from it's social media engagements to the analytical community at large as a means of obtaining analysis and supporting the DoD effort overall. Data analysis competitions could also be used to foster camaraderie and bring in new technical talent.
- **Invest in long-term alternative solutions.** Advocate and research alternate communications strategies that might attenuate the aspects of modern social media unfavorable to rendering end states amenable to US strategic goals. Possible alternative solutions are decentralized internet infrastructures and applications (dapps), peer-to-peer computer networks, and blockchain distributed trust chains. Preferring on-premise federally owned assets for a cloud implementation could be an immediate

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consequence of changing the long-term vision for USSTRATCOM computing and deployment of strategic narratives and messages in the future.

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