SOCIAL SWARMING

Asymmetric Effects on Public Discourse in Future Conflict

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PHOTO: A man shouts after a missile hits in a house in Aleppo, Syria, 3 January 2013. The fighting is part of the escalating violence in the Syrian civil war that the United Nations estimates has killed more than 60,000 people since the revolt against President Bashar Assad began in March 2011. (AP Photo/Andoni Lubaki)

T WEETING DURING THE Arab Spring? That's so 2010. A future tactic in cyber-based-information warfare is built upon mobile-media wielding e-citizen soldiers employing social swarming tactics to overwhelm a system, a decision maker, or a critical node.[1]

These mobile networks are vital to starting and maintaining cyber-based insurgency, drawing physical and moral strength from super-empowered individuals, while also using super-connected-individual networks to spread information, move undetected, and muster support, constantly one step ahead of authorities. It is possible for this swarm to move from the online world into the real world where violence may ensue.

Understanding Swarming

To understand the nature of communication-based social swarming, one must understand the concept of "battle swarm," introduced by John Arquilla and David Ronfeldt of the Rand Corporation in 2000.[2] Their essay, "Swarming and the Future of Conflict," studied historical conflicts placing context on smaller, less-equipped individual forces defeating larger, more equipped forces by overwhelming the system and decision makers. Using swarming tactics, by building off the past warfare approaches of melee, massing, and maneuver, "social revolutions would, in coming decades, help bring about the downfall of empires," according to the Rand study.[3] Swarming as a military tactic "implies a convergent attack by many units."[4] The Rand report
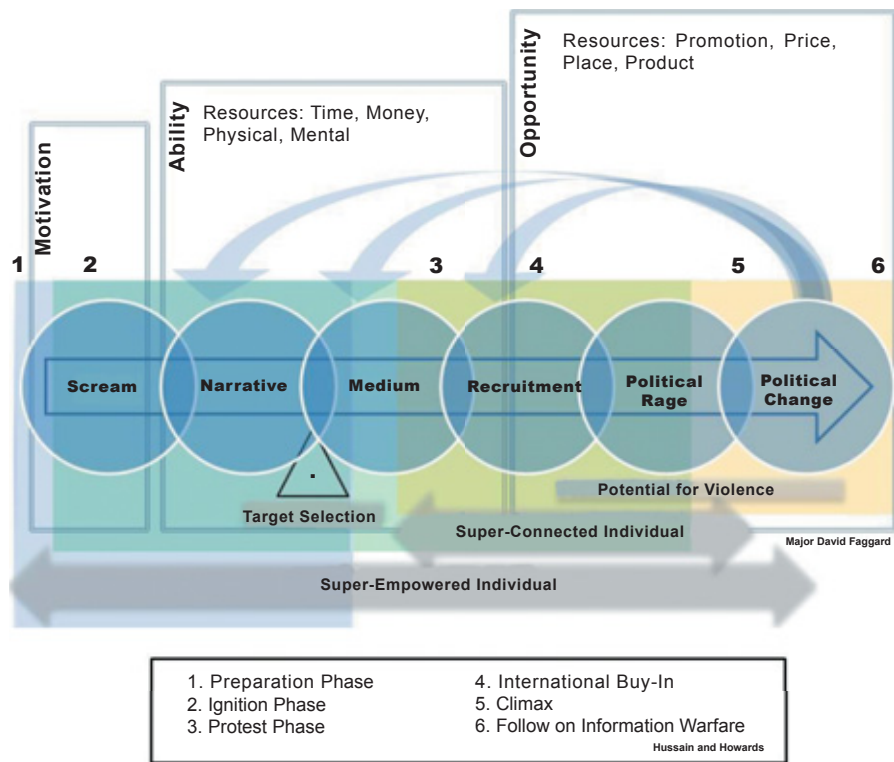
Figure 1. Communication-based social swarm

argued that swarming must be able to be employed from multiple directions, which clearly the hyper connectedness of the Internet and digital devices allow, and that the swarm must also perform sensory operations on the selected target.[5]

Imagine a mob of hyper-connected actors—Howard Rheingold referred to it as a "smart mob"—constantly one step ahead of authorities because it employed real-time, GPS-enabled devices. With these devices it could data-burst updates to its swarm.[6] The only things in the swarm's way attenuating communications among members are the seconds it takes for servers to refresh. These conditions mean the 24-hour news cycle would be obviated. This smart mob, as we saw in the 2009 Iranian presidential elections, created melee, had mass, and through exploitable off-the-shelf and widely available data technology, was able to maneuver where government forces were not.[7]

Social swarming is more than using the Internet or social media; it entails network envelopment of the information aspect of modern command and control. These complex networks are optimal when fully connected and flat with opportunity for direct "horizontal communication" between network peers.[8]

Swarming model. A working definition for this essay would be that social swarming employs the full computing power of mobile technology with real-time network updates to strategically organize e-citizen forces to overwhelm an opposing force online achieving one's own political ends.

The overall objective of this information-based social swarm would not be the kinetic destruction of a system or node, but the disruption of the node's ability to make a decision.[9] The implications of this aspect of cyber- or net-centric warfare on a decision maker's ability to keep order are critical in humanitarian or homeland operations. However, dark-actors, either homegrown or transnational, could potentially employ social swarming for purely kinetic reasons, as was the case with the 2011 Mumbai attacks.[10] In addition, social swarms might be used by insurgents of a "connected" state in "phase four" operations.

Overlaying on recent communication-based events, Mia Stockmans' refined MAO-Model of Audience Development, as well as this author's personal observations on advocacy-based communication, provides a working model for communication-based social swarming (Figure 1).

Additionally, incorporating Muzammil M. Hussain and Philip N. Howard's working "6-Stage Framework for Political Change" offers an in-depth study on the recent Arab Spring (March 2012), which validates the working model of communication-based social swarming.[11] After explaining the models of Stockmans and Hussain and Howard, this author provides a working graphical representation of the communication-based social swarm model.

Here, I interpret Stockmans' model while overlaying it with personal experience from years of advocacy-based public-communication campaigns. Stockmans' refined motivation, ability, opportunity (MAO) model of audience development provides a basic starting point for a dynamic model of communication-based social swarming.[12]

Motivation. Where Stockmans' model ends and the communication-based social-swarm model begins is motivation. Stockmans' model explains that motivation for participation in an event is largely cultural, based on desire and past experience, not life-threatening necessity.[13] Being compelled to overthrow an oppressive regime is a significant investment, a natural reaction to oppression, brutality, or another self-perceived injustice.[14] In other words, this catalyst event, which she calls the "scream," is a force within oneself that literally "motivates" one to commit some form of action you would otherwise not do under normal circumstances.

Ability. The ability Stockmans describes focuses on the resources of time, money, and physical and mental capacity.[15] Time is relative online; quicker is paramount, while monetary resources are minimal. In the ability step of the communication-based social swarm model, it is appropriate to list additional factors required to start mobilizing a swarm online: narrative and medium, as well as target selection, all of which fit within Stockmans' descriptions of resources.

Narrative. Narrative drives action. Narrative allows an audience to relate to the subject rationally.[16] Narrative is as much about the receiver as it is about the message. Narratives explain societal fabric, "beliefs, attitudes, values, and actions," and allow the receiver to connect with the sender through stories.[17] Moreover, culture, socioeconomic status, and personal beliefs create audience reference points for narrative. Narrative can create third-

party advocacy or kill it.[18] Defense Department communicators build reputation-based narrative in the world every day, according to Gallup confidence surveys, which indicate the U.S. military has the highest confidence amongst Americans.[19] Defense Department Public Affairs' efforts shape these narratives for Americans. Moreover, the narratives shape network-based power.[20] However, depending on the receiver's lens and narrative interpretation, tremendous effects may result.

Medium. The medium for the communication-based social swarm can be the regional, national, or tribal online network based off the globally connected information grid and its ability to employ mobile media. Target selection can occur before or after narrative development. However, if the target is selected before narrative development, the narrative may need to be reworked throughout the process or the final online endstate may not be achieved. The narrative is then translated by way of a super-connected individual across the online medium to the mass base.

Recruit, rage, change. The mass base is recruited into this movement, typically through the already-established online followership of the super-connected individual driving towards some form of political rage, otherwise known as the advocacy issue. At this point, there is a potential for violence, melee, or maneuver. Finally, after the rage, there is a possibility for political change. If the political change does not occur, a super-empowered individual can refine the narrative, or a super-connected individual can increase the mass base, change the medium, or continue "pulse-attacking" the government communication apparatus while striving to create confusion.[21]

Opportunity. Opportunity described by Stockmans follows "promotion, product, place, and price" (the "4Ps" of marketing, which is a 1960s' marketing formula that still applies to online communication today).[22] A recent marketing brochure for this online technique says: "Where the voice of one can quickly become the voice of one hundred or one million."[23] "Promotion" for a social swarm is synonymous with recruitment based on narrative. "Product" is the "purchasing" of a continuation of the current corrupt governmental practices or an attempt to mass together with like-minded actors for the installment of a new government. "Place,"

referred to as "everyplace" in social swarms, will first take root globally online. It is the final P, "price," which likely weighs on the social swarms' potential recruits most. The "price" for this endeavor may be a changed life, death, or imprisonment.

Stockmans adds that in opportunity, actors might not be willing to act if there are significant environmental barriers.[24] With a social swarm, this is a decision point where actors may decide it is too dangerous to rebel, and maintain the status quo, or it is too dangerous not to rebel, and suffer more potential disruptive events. This is also the point at which there is a potential for kinetic violence to begin.

Super Empowerment and Super Connectedness

Thomas Friedman described super-empowered individuals in his essay on globalization effects, "Longitudes and Latitudes," as those who could "act much more directly and much more powerfully on the world stage."[25] Friedman explained how Osama bin-Laden and the effects he could muster, through the results of globalization, would bring about problems nations would have to deal with in the future.[26] The motivating catalyst event is a traumatic event suffered by a victim, which may lead to a super-empowered person providing spiritual, military, or ideological guidance to the masses. This development helps shape narrative.[27] In public relations, this super-empowered individual might be seen as the "influencer," or the person who might develop narrative in a third-party advocate situation.

However, online mega-influencers can be referred to as super-connected individuals. These are the actors who by their position, celebrity status, or wealth are connected to tens of thousands of others and can build and recruit the network to propagate narrative. Often their followers may take information and retransmit it to their networks, compounding the effects of virally spreading information. The super-connected individual's reach is potentially unlimited online, especially when the data relayed is of value (potentially carrying life or death importance) to the swarm.[28]

A super-connected individual's potential threats to U.S. interests in remote hot spots are evident in situations like that of Pakistani citizen journalist Sohaib Athar, who unknowingly tweeted by way of
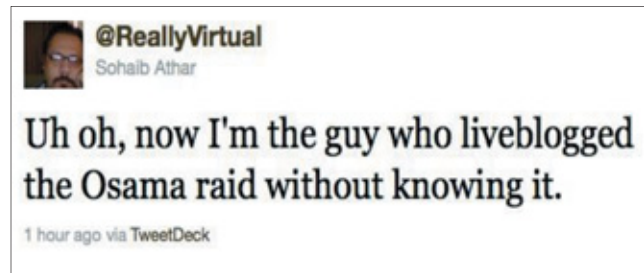

Figure 2

@ReallyVirtual (Figure 2). He conveyed real-time details about America's covert and secret mission designed to get Osama bin-Laden.[29] Athar's near-instant accounts are not uncommon in today's operational environment. Anyone, anywhere can inform a global community regarding any matter in seconds, no matter how classified and compartmentalized. Although no physical social swarm occurred in Athar's case, one can only imagine the international crisis that may have occurred if a smart mob of a dozen followers of his subscribers (750 at the time) showed up at Bin-Laden's Abbottabad compound and confronted the Americans. After live tweeting the Bin-Laden mission, Athar, a Pakistani information technology Twitter user, created one of the largest Twitter followings in Pakistan with more than 70,000 followers.[30] Even though Athar was within the closest proximity for his network to directly affect the operation, the real super-connected individual in

Figure 3

the Osama bin-Laden example was Keith Urbahn (Figure 3).

Urbahn is a former assistant of former Secretary of Defense Donald Rumsfeld.[31] He spread word online that America may have killed Bin-Laden.[32] When Athar tweeted, some of the world took notice; when Urbahn tweeted, many in mainstream media,

Figure 4
Each node represents a twitter user that mentioned @KeithUrbahn within 1 hour and 15 minutes of his infamous tweet. Readers can find this representation at <http://blog.socialflow.com/post/5454638896/breaking-bin-laden-a-closer-look>

as well as prominent social media users in government and society, took notice and perpetuated that message. Based on Figure 4, it is easy to see what nodes in the network offer the biggest reach with the smallest bit of information.[33]

David Singh Grewal provides an appropriate definition for a network using a communication-based social swarm model: "an interconnected group of actors linked to one another in a way that makes them capable of beneficial cooperation." Network power, Grewal argues, results from societal coordination and new global standards brought forth through a revolution in technological advancements via the elimination of distance and reach from the concept of globalization.[34]

Hyper-connected swarming. Social swarms operate in an "all-channel" network; that is, the swarm is capable of being hyper connected to every other member of the swarm, and there is neither a superior nor a follower, but all operate independently and collectively to support the swarm.[35] Social swarming is both nodal and nodeless.[36]

My communication-based social swarming model also builds off Hussain and Howard's "6-Stage Framework for Political Change." However, there are some differences based off marketing and public relations experience and the communication aspects of the social swarm model.[37] My communication-based social swarm model includes Hussain and Howard's stated phases with numbers one through six to represent their input. Step one is the "preparation phase," which they state includes recruitment and narrative development, as well as medium identification. This is the phase where the mass base may start searching for narrative. The "ignition phase" follows a catalyst event. A "protest phase" follows, which organizes networks offline to build larger numbers online and in person. An "international buy-in phase" follows, which, through online media, allows for the global community to be aware. The "climax phase" follows, where real-world actors on both sides of the issue can clash. Finally, a "follow-on information warfare" phase happens where actors clash in the social, cultural, political spheres online and in person, vying to define the new makeup of the movement, government, or the nation.

The communication-based social swarm model in figure 1 is best understood with recent events in 2009 Iran, 2010 Haiti, and 2010 Tunisia, followed by a future cast of Pakistan.

Iran. The June 2009 Iranian presidential elections appeared to be corrupt when President Mahmoud Ahmadinejad defeated Mir-Hossein Mousavi, causing nationwide protests that initially went largely unnoticed in American mainstream media.[38] According to Alex Burns and Ben Eltham, "citizen activists" took to the streets in Iran largely due to access that Twitter provided the Iranian people.[39] Eventually the Internet's global reach and influence channelized mainstream media and prominent bloggers to report on the protests. Regional users even altered their personal online settings like time-zone stamps to reflect Tehran time. Many online personas also changed their profile photos to reflect a green tint to go along with the narrative of a "green-color" revolution.[40]

As a medium, the advocacy-based social-media effort, "Help Iran Election," gathered 160,000 citizen activists to support the Iranian revolution online from other countries.[41] This peacefully led social swarm was further emboldened and assisted

by hackers who attacked Iranian government cyber networks.[42]

One must ask why did the social swarm not topple the repressive Iranian regime. According to Burns and Eltham, it is likely because the Iranian people were not willing to counter the brutal acts of violence committed by the Basij military forces on the streets targeting the cyber activists.[43] These forces were likely the "environmental factors" Stockmans identifies as roadblocks to "opportunity."

Haiti. In 2010, the U.S. Air Force social-media team found itself dealing directly with a communication-based social swarm while Airmen supported Haiti relief efforts following that nation's devastating earthquake. Haiti's infrastructure, to include its major ports and airport, were ravaged by the earthquake.[44] On the ground in Haiti, a small team of Air Force special operations airmen filled in as air-traffic controllers. Because the earthquake severely damaged airport capabilities, these airmen determined aircraft- landing priority for the severely overcrowded runway based on aircraft cargo and priority.[45]

A Doctors Without Borders airplane circled overhead because there was literally no more room on the flight line, so they took to the online world and Twitter. When super-connected individual Ann Curry became aware of the issue, she spread the message via Twitter that the Air Force must let the aircraft land. That tweet would go down as 2010's "most powerful tweet."[46]

Within minutes the Internet exploded, and the swarm "pulse attacked" with direct messages, questions, and accusations flooding Air Force Websites, chat rooms, forums and blogs, eventually leading to massive amounts of mainstream press coverage. The Air Force social media team replied to the fervor nearly instantaneously, but the social swarm

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was mobilized and calling upon DOD decision makers for action. A short time later, the Doctors Without Borders aircraft was allowed to land.[47] Although the successful landing of the aircraft was not directly related to the online attention, the attention the issue caused online made Pentagon senior leadership aware, many who personally respond and interact with followers on Twitter.[48]

Arab Spring. The Arab Spring example was of Mohammed Bouazizi, a Tunisian who turned himself into a super-empowered individual through self-immolation in December 2010 to protest increased prices of local goods and local police brutality and corruption.[49] Bouazizi's self-immolation, recorded on video and used in many online and mainstream media sources, instantly turned Bouazizi into a super-empowered individual by providing the region a narrative for the Arab Spring.[50] Obviously digital and social media did not cause the Tunisian people to overthrow the Tunisian government, but Bouazizi's suicide and his funeral were captured on mobile-phone video and later broadcasted by mainstream media and online, creating a narrative for the movement that many in the region could sympathize and empathize with.[51] With Bouazizi's video so viral, it is impossible to track down who created and distributed it initially, but the narrative was created and exploited through horizontal communication, which made advocacy easier for a social swarm to form.

Pakistan. Potential threats to U.S. governmental interests using social swarming could be affected in the Federally Administered Tribal Areas (FATA) of Pakistan where a lack of U.S. narrative clouds a nation struggling to assert sovereignty and regional power in light of the recent American-led Bin-Laden mission, alleged drone strikes, and transnational terrorism. Placing the expanded MAO model against the backdrop of current tensions in Pakistan and Al-Qaeda front man Ayman Al-Zawahiri's recent comments calling for national revolution, one must ask, "What is next for the nation of Pakistan?"[52]

In the FATA region, U.S. narrative is nearly dead. This is an area where American strategic interests lay.[53] However, only 12 percent of Pakistanis view the U.S. positively.[54] Furthermore, other nations in the region believe America is a military threat to them, according to Pew research.[55] Host-nation and nonstate propaganda efforts likely frame this

Mahmoud Salem, right, speaks to people before he suspends his campaign for parliament during the unrest in Heliopolis, a suburb of Cairo, Egypt, 16 November 2011. Salem, one of Egypt's most prominent activist bloggers, suspended his campaign to join the protesters in Tahrir. Salem was part of a core group of online activists who used social media to spread the word about police abuse and corruption under Mubarakt.

narrative. Framing allows users to "understand an experience."[56] Pakistanis develop anti-U.S. narratives at home, at places of worship, and even in the government.[57]

Furthermore, Americans fulfilled Pakistani narratives when the United States invaded Afghanistan in 2001.[58] Years of negative U.S. framing likely created a damaging U.S. image in the region.[59] The vacuum of a U.S. narrative along the Afghan-Pakistan border contributed to regional, tribal, and familial anti-U.S. narratives, making dynamics favorable for terrorism recruitment.[60] From the Pakistani lens of a nation under attack, allegedly by drone aircraft, almost 70 percent of Pakistanis now want U.S. forces out of Afghanistan.[61] Pakistani perceptions of America will continue to decline as long as these alleged drone strikes along the border continue without explanation or transparency from the governments involved. Is what happens next in Pakistan based off the social swarm model?

One must ask why the Pakistani people have not responded to the issues affecting them, in a way similar to the Arab Spring. Some theories exist.[62]

However, the answer to the question is largely unknown. Still, a super-empowered individual, now-Al-Qaeda chief Ayman Al-Zawahiri, recently called on the people of Pakistan to revolt against the Pakistan government and follow a similar path as in the Arab Spring.[63] Using my communication-based social swarm model, if Pakistanis in the FATA region view their nation's governmental policies regarding Western operations as life threatening, this may be a catalyst event for some of them. Rounding out the items needed for a social swarm to begin, consider this list:

● They have a super-empowered individual, Zawahiri, who has developed narratives of corruption, anti-governmental feelings, and economic decline, and he has engendered swaths of potential recruits.[64]

● Whether those affected by a catalyst event have a super-connected individual is not clear.[65]

● They need a ready and willing person to provide a medium and network.[66]

● They also need someone willing to socially swarm online or in person.[67]

The social swarm's Pakistan medium is present with 68.2 percent of Pakistanis having access to a mobile phone.[68] Pakistan's understanding of the widespread usage of mobile devices as a "terrorism tool" is only beginning to take form, as evinced by that nation's recent legislation to ban the sale of mobile SIM cards without biometric data.[69] Additionally, only 37 percent of Pakistanis support that nation's efforts against extremism in the FATA.[70] One solid aspect to the opinion polling of Pakistan though is that approval rates of terror groups like Al-Qaeda and the Taliban are in decline.[71]

Alleged drone strikes, reportedly surgical in nature and only killing intended targets, may not be enough of a catalyst for the mass base to rally against the Pakistani government and the alleged U.S. mission there. However, perception can obscure reality, and if the FATA people believe in their narrative, anything can happen.[72]

According to civilian researchers, the accuracy of the alleged drone strikes is not in question. The aircraft and systemic processes are on target, and, assuming these strikes could be a catalyst, their accuracy could explain why they have not triggered social swarming in Pakistan.[73] The lack of a social swarm may not be because of insufficient narrative, lack of medium, or low recruitment. It may be because the catalyst effect is not as large and as widespread in the FATA region as it is reported to be by news media. However, the global narrative of perceived civilian casualties stemming from drone strikes is significant.[74]

Cost and widespread usage. Finally, the concept of a communication-based social swarm has strengths, weaknesses, opportunities, and threats in the offense, as well as the defense. The largest strength to the concept of a communication-based social swarm is its cost and widespread usage. Free mobile-media-enabled platforms like Twitter, Facebook, and Google offer a wide range of latitude to organizations operating within a constrained budgetary environment. For the United States, these efforts can be relatively quick, in a society that spent the past decade at war. The biggest strength to this free tool is its size; nearly a billion people are on Facebook alone; that is tremendous reach within the network pool.[75] Additionally, large pools of employees are not necessarily needed to use these tools because of the distributed network of users already in the system. History provides a window into the development of communication; from pretelevised town-square community gatherings, to the printing press, to megaphone-like mainstream media, and now to global town halls not constricted by borders or time zones, the Internet is a game changer.

A weakness in my statements about communication-based social swarming may be the fact that they are rooted in years of personal experience. Additionally, many online strategists believe that the "4Ps" of marketing may be out of sync with the communicators and networks, which operate primarily online.[76] It would be inappropriate not to mention the collection of effort written against this topic as well; some believe the capability is a utopian view.

Evgeny Morozov, in his book *The Net Delusion*, offers his counterpoints to the concept that online media can spur revolution. His arguments provide debate on the growing power of Google, foreign spy agencies collecting data on everyone, and the consequences of an open and free Internet. However, the book is all doom and gloom with little optimism.

In addition, while access is a strength to communication-based social swarming, it is also a weakness; places like North Korea and many others around the world labeled as "Internet black holes" will likely have no ability to create meaningful social swarms.[77] If a super-connected individual built a network of swarmers within one of these countries, he would likely bear the brunt of national censorship and repressive governmental practices.

The bread crumb trail. A big weakness when employing social swarms is the digital bread crumb trail the Internet user leaves behind. This trail provides an avenue for quick vengeance from proregime forces to locate and neutralize online activists, as was the case in Iran.[78] Additional weaknesses include mobile-media's ability to "Geo-Tag" photos and video. These geo-tagged products inherently contain the natural data needed by swarmers to communicate and plan with each other; however, the ironic weakness is that the governmental decision-making node would in theory be able to track the GPS-enabled device either in real time, or through the GPS-enabled photo or video. Furthermore, any data broadcast over air waves would be vulnerable to interception and jamming through a variety of methods.

Opportunities for communication-based social swarming include traditional functions of command and control on the part of the swarming force, as well as the governing decision-making node. In addition, the concept goes further into the areas of foreign intelligence gathering. Avenues like the American Open-Source Center or U.S. Cyber Command may be potential mechanisms to monitor communication-based social swarms. However, transmitting and interpreting that intelligence for real-time battlefield commanders or police officers is another problem all together. An additional opportunity may rest with the U.S. government's role in cloak-and-dagger missions of organizations that specialize in insurgencies. Communication-based social swarming provides another aspect in fighting, monitoring, and recognizing, as well as defeating insurgency.

Threats to communication-based social swarming include the vertical communication structure found throughout bureaucracies. Any response agency would ultimately need a network-organized structure capable of handling vast amounts of data and directing it downward directly to company-level or police-precinct leaders. Waiting weeks, days, or even minutes is far too long for national response agencies to maneuver within the decision space of an online social swarm. Threats additionally might come from dark-network elements attempting to employ communication-based social swarming in fragile or failing states, thus working with rebels to ignite turmoil online instead of taking a target by force—a cyber-social insurgency.

Future Threats

One potential future threat is with warfare itself. A communication-based social swarm may have both assisted and softened Georgian defenses during the 2008 five-day war with Russia. During Russia's "cyber-softening," "cyber patriots" allegedly attacked the Georgia infrastructure before kinetic operations ever began.[79] It is widely rumored that Russian-hired "hacktivists" enlisted e-cyber soldiers (everyday citizens) from popular social networks to conduct cyber attacks against the Georgian government's online infrastructure.[80] Imagine if, weeks before the cyber offensive, efforts of social swarm recruitment may potentially have affected the outcome of that conflict.

Communication-based social swarming is in no way a panacea. It does offer methods for starting, stopping, and coordinating online insurgencies, while also creating governmental confusion in a moderately connected society. Its methods are furthered when repression and corruption are rampant, when a narrative is easy to come by, and when diplomatic access by other world powers is not easily attainable, as was the case in 2009 Iran. In situations like the Arab Spring in Libya, social swarms employing online social media action can assist with the revolution. In this case, it was possibly because NATO military force limited "barriers" from government forces.[81] Without this military checkmate, pro-Qadaffi forces might have fared much better.

With a nodeless organization, a fully integrated and funded interagency effort within a joint task force for global communication (operating under a loosely defined role with, but not subordinate to, U.S. Cyber Command) would provide the best possible way for America to identify, counter, or adapt to an online social swarm. The process of forming online groups capable of creating tension to overwhelm decision makers or government forces through a communication-based social swarm is possible. Government decision makers should take these swarms and their access to democratized digital technologies into account in future planning scenarios. **MR**

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