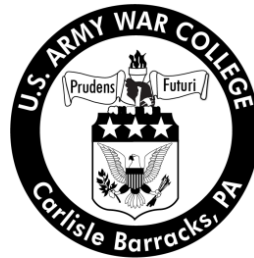


Enabled Masses: Challenge and Trust within Modern Social Networks

by

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United States Army War College
Class of 2013

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Enabled Masses: Challenge and Trust within Modern Social Networks

A revolution can be neither made nor stopped. The only thing that can be done is for one of several of its children to give it a direction by dint of victories.

—Napoleon Bonaparte¹

Introduction

It is often difficult to recognize the moment when a simple action creates exponential consequences, as people require time and perspective to assess change. History marks consequential moments retrospectively, but when a person lives in the midst of revolutionary change, trying to sort out cause and effect in perspective becomes nearly impossible as constants become variable and consequences become outcomes. Experts offer that we live in times of an information revolution where the rapid adoption of powerful new technologies is changing the foundations of society, and where the convergence of people and new electronically enabled tools makes “seeing the elephant” even more daunting.²

Societies faced technological and social convergence many times before as innovations like the movable-type printing press enabled the spread of literacy in 15th Century Europe, and the development of the steam then combustion engines propelled social change in the Industrial Revolution of the 19th and 20th Centuries. Sociologist Manuel Castells of Catalonia University writes that the past three decades of the Information Revolution is changing the structure of society, but that technology itself is not a sufficient condition alone to cause change because technology requires utility to be relevant.³ Castells offers that people are the critical determinants of change be it technological, intellectual, or social, and when technology enables people to overcome barriers and challenge the status-quo, history often makes note of that too.⁴

Recognizing these challenges and changes, the Chairman, Joint Chiefs of Staff published the *Capstone Concept for Joint Operations: Joint Force 2020* to frame past events, provide perspective, and address some security challenges facing the United States in the next decade. The paragraph below describes the remarkable impact of new, Internet enabled, social technologies and the consequences of increased public scrutiny of military operations.

The diffusion of technology that is transforming warfare is also reshaping global politics. Social media can catalyze protests in days that popular movements once took months or years to build. The penetration of mobile technology especially in developing nations will dramatically increase the number of people able to access and share information rapidly. The ubiquity of personal communications devices with camera and full motion video also allows much of the world to observe unfolding events in real time, rendering future operations increasingly sensitive to popular perceptions. As we have learned in Iraq and Afghanistan, military actions will receive intense media scrutiny, a dynamic that potentially invests otherwise inconsequential actions with strategic importance.⁵

As a predictive framework, Joint Force 2020 seeks to identify the conditions of the future environment, but the challenge remains daunting as military leaders seek to define change by the manifestation of its consequences and outcomes. As such, Joint Force 2020 attributes remarkably powerful forces to the diffusion of new technologies, saying that they are “transforming warfare and reshaping global politics.”⁶ While there is no argument that Information Revolution technologies advanced the means of war, this paper will analyze the assertion that social networks act as a catalyst for change and why the diffusion of mobile technologies presents a challenge to future operations in terms of organizational trust more than simply increased scrutiny. Military leaders need to understand and appreciate the sociological processes enabling this new medium, as emerging technologies will expand these networks and when this happened previously, the outcome did not bode well for those in power.

This paper will explore, analyze, and discuss three elements of the rise of technologically enabled social networks. It first explores how people leveraged modern communication technologies to overcome political barriers and challenge authority in China, Iran and the uprisings of the Arab Spring, and why referring to social networking as a catalyst may diminish appreciating the importance of traditional socio-political pressures. The paper then examines the social and neuro-science behind the phenomenon of technologically enabled social networking, why visual imagery and the spread of mobile technologies present challenges, and how organizational trust models provide potential solutions. The paper concludes with identifying the potential opportunities and challenges facing the Joint Force in future military operations and provides broad recommendations for Joint Force Commanders.

Rapid Adoption and Unintended Consequences

In the past, new technologies often took decades to penetrate societies, largely due to economics and the physical realities of infrastructure development. However, the diffusion of communications technologies in the latter decades of the 20th Century appears unique at least in terms of the speed of technological innovation, market penetration and adoption. For example, Bell Labs invented the solid-state transistor in 1947, and it took decades of tangential development and market forces to create the opportunities afforded the incredible microprocessor powered technologies of today.⁷ The Information Revolution is really about the global distribution of affordable technologies and economics, but as Castells previously posited, people determine the utility of a new technology and choose to either adopt or discard it in favor of a better solution.⁸ The commercial processes that continue to drive the Information Revolution show no signs of slowing, as mutually advantageous technologies merge and

production costs decline, people derive utility from how societies apply these new technological innovations. The figure below represents U.S. adoption rates for consumer technologies from 1900 to 2005. In this illustration, there are three different models at work.

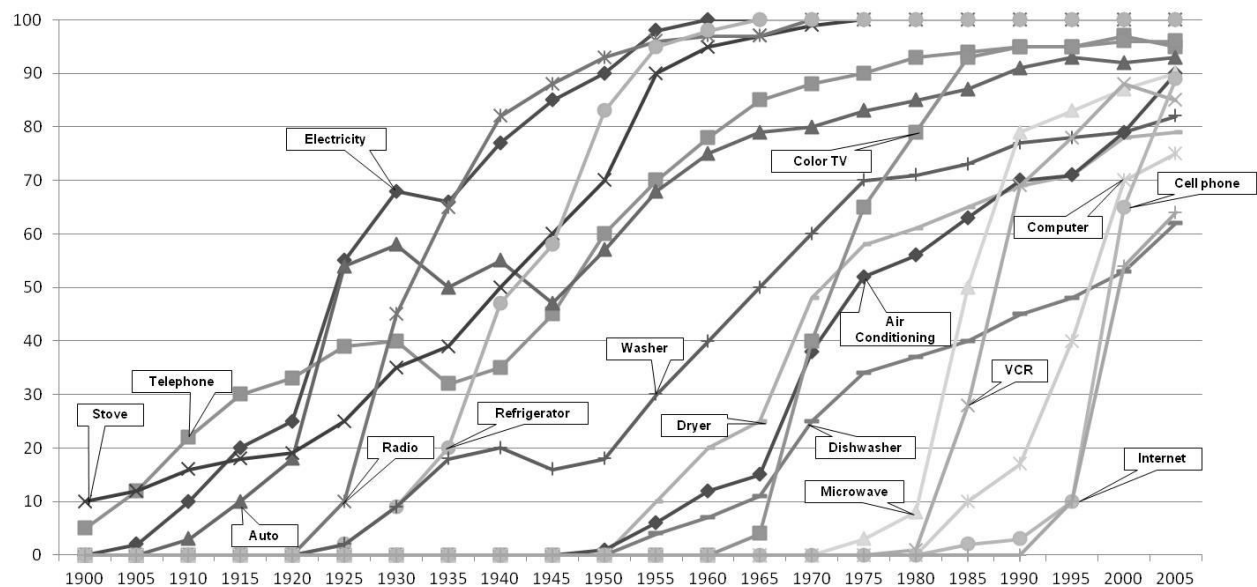


Figure 1. U.S. Adoption Rates for Consumer Goods from 1900-2005⁹

The first is a traditional adoption model shown in the early half of the 20th Century on the far left. This model shows a long and gradual adoption path in products like the automobile and telephone. The second model is present in the middle of the century, as there is a more rapid adoption cycle at work in the distribution of the radio, refrigerator, and color television. What is unique is the change seen at the very end of the century, on the far right, where the adoption rate is nearly vertical, or compressed within a relatively short duration as shown in the cell phone, computer and Internet. This acute verticality is emblematic of revolutionary development, rapid adoption and mutually supporting, self-propagating innovation spreading rapidly across multiple market segments and through traditional barriers such as price and availability. This occurs

because the products provide remarkable utility and consumers view them as indispensable and truly valuable tools.

In developing countries, where new technologies promise appealing utility and opportunities to avoid costly Industrial Age infrastructure development, these nearly vertical technological adoption rates can enable capabilities that may have been overlooked by authorities.¹⁰ For example, a developing country may not have the means to invest in traditional telephone infrastructure that requires years to deploy thousands of miles of cable. Mobile telephone technologies offer the opportunity to avoid fixed costs associated with establishment of infrastructure. Choosing to establish a mobile telephone system offers the added utility of providing connectivity to its citizens at lower costs. While the “leapfrog technology” bargain may be economically appealing, it may also introduce unintended consequences like enhancing access to external information environments beyond the control and influence of restrictive governments or regimes.¹¹ Two recent examples associated with China’s Severe Acute Respiratory Syndrome (SARS) outbreak and Iranian election protests will illustrate these unexpected challenges and consequences.

China’s SARS Epidemic and Iranian Election Protests

China’s SARS epidemic began in November 2002 in rural Guangdong Province with a number of patients exhibiting “unusually acute, atypical pneumonia” with high communicability and mortality.¹² As the unidentified illness spread, Chinese authorities responded, attempting to contain the outbreak. Containment of the illness and the potentially negative information of the outbreak were important to the local government as they sought to control the situation and protect seasonal revenues from workers returning home for the lunar New Year.¹³

On 8 February 2003, as the illness spread rapidly beyond Guangdong, an anonymous mobile telephone user sent a Short Message Service (SMS) text message to a small group of people saying “a fatal flu in Guangdong,” via a widely available, Global System for Mobile Communications (GSM) mobile telephone. SMS text features are part of the basic functionality within GSM phones, and as one in five people in China possessed a GSM phone, 40 million cell phones received the re-transmitted text warning on the first day and over 120 million received the text warning within two days. The unprecedented spike in SMS activity caught the attention of regional journalists. As coverage of the flu warning spread, the World Health Organization began asking the Central Party in Beijing what was going on in Guangdong.¹⁴ In the three months that followed, the virus broke containment and spread globally as air travelers carried the virus to cities around the world. Also during the three months of the outbreak, mobile text messages and Internet forums continued to spread criticism of China’s government globally. Public messages questioning and criticizing official comments of authorities damaged the credibility of a Chinese government struggling to contain 26.5 billion text messages and growing Internet enabled criticism in a new and unconstrained social communications environment.¹⁵

According to a U.S. Congressional Research Service report, the mobile phone forced Chinese leaders to “adjust their [crisis response] strategy by publicly embracing two radical concepts: [that] the public has a right to know about information directly concerning their daily lives and [that] government officials need to be accountable to the public for their performance.”¹⁶ While the SARS epidemic would eventually claim over 8000 victims globally, this is an example of people leveraging a new and unconstrained

technological medium to overcome barriers to challenge a restrictive regime that sought to meter information in order to retain control.¹⁷ Most importantly, the SARS text message represents public action in response to an inherent lack of trust and confidence in a government. When confronted by a need, people leveraged the tools they had at their disposal to compel action.

The Iranian election protests of 2009 provide another strategic example of people leveraging new technologies to counter a lack of governmental transparency. In this case, the convergence of Internet based social networks and enhanced mobile telephone technologies enabled anti-government protesters to broadcast their efforts globally in spite of Iranian government efforts to isolate the unrest. Newly developed Web 2.0, mobile social networking applications like Twitter, Flickr and YouTube became a means through which protestors in Iran communicated unrest and political cause with the rest of the now globally connected Internet.¹⁸

In 2009, a reformist presidential candidate, Mir Hossein Mousavi, ran against Iran's current conservative President, Mahmoud Ahmadinejad.¹⁹ The *mowj-e-sabz* or green-wave movement supported Mousavi's efforts to deliver civil rights changes promised during the 1979 Iranian Islamic Revolution. However, when election results announced Ahmadinejad the victor, the *mowj-e sabz* movement organized protests to annul the election's results.²⁰ Initially, the protests were peaceful as thousands marched in the streets of Tehran and other major cities, but they turned violent after the ruling government banned demonstrations and police turned on the protesters. While political protests that turn violent are often newsworthy, what made this incident unique was its manifestation through a then new Internet application called Twitter.²¹ Also unique to

this event was the ability of protestors to rapidly produce and globally distribute their words, images, and full-motion video through next generation, Internet accessible “smartphones” that enabled broadcast through the Internet without the use of a fixed-line computer connection.²²

As the protests developed, international media organizations, which were either prevented from reporting or denied access, followed events vicariously through the Internet. As media reported more and more events, peer-to-peer social network users followed events directly via Twitter, Flickr and on YouTube. Iconic images and electronic comments flowed from Iran despite early steps taken by the Iranian authorities to limit media coverage by closing Iranian newspapers, jamming television broadcasts, and blocking Internet access.²³ The Internet and its associated platforms proved too complex a medium for the Iranian government to control. As the situation progressed, the U.S. State Department took the remarkable step of contacting the commercial owners of Twitter and requesting that they delay scheduled maintenance on their systems as Twitter was “one of the areas where people are able to get [information] out [of Iran].”²⁴ According to the Heritage Center’s Dr. James J. Carafano, the Iranian government’s efforts to control information were unsuccessful because mobile accessed social networks did not have specific Internet addresses to block, so merely blocking an Internet website did little to stem the outward flow of information.²⁵ The protests in Iran continued for months, but lost their momentum as the ruling government eventually disrupted social communication mediums and arrested protest organizers, but not before suffering significant criticism and loss of credibility in front of a global audience.

In both the Chinese and Iranian examples, affected governments reacted to a groundswell of unconstrained public outcry through mediums that the government had sanctioned in pursuit of the positive “leapfrog” capabilities they offered. When citizens used these technologies as a means to counter the ruling government’s hold on power, the people’s unconstrained comments, postings and protests highlighted long-standing issues of public trust and confidence. In retrospect, these incidents did little more than temporarily disrupt the ability of these governments to control their internal information environments, and both China and Iran subsequently instituted far more restrictive public communications policies in the aftermath through the creation of China’s “Great Firewall” and Iran’s “Second Internet” to prevent this kind of disruptive activity in the future.²⁶ The question then is whether information technologies can create real social or political change, or is it just a means to propagate rancorous public disruption?

In addressing this question, Joint Force 2020 cites social networking as a catalyst that can accelerate and amplify public protest to create political change faster than previously possible. This perspective is likely a reference to the events of the Arab Spring in 2011. While western press and social media providers were quick to ascribe social networking as a principle cause contributing to the overthrow of regimes in Tunisia and Egypt, a deeper analysis appears to point more toward social networking acting as a virtual commons than a mob storming the Bastille.

Tunisia and Egypt in the 2011 Arab Spring

The events of the Arab Spring began on 17 December 2011 when Al-Jazeera broadcasted a YouTube video of a rural Tunisian protest and consequential self-immolation of a vegetable vendor, named Mohamed Bouazizi, across the Middle East and North Africa (MENA.)²⁷ In the resulting groundswell of public outrage, the Ben-Ali

government of Tunisia would fall in less than a month due to unrest and militant actions, and the Egyptian government of Hosni Mubarak would collapse 18 days after Tunis. In the months to follow, public protests would challenge governments across the Middle East, Libya's government would fall to long repressed militant factions with direct military support from North Atlantic Treaty Organization forces, and Syria's protests devolved into a civil war that continues today.²⁸

International media covered much of the unrest across the MENA both in direct reporting and secondarily via social networks, in much the same way they did in coverage of the 2009 Iranian election protests. The media was quick to highlight the growing voice of the Arab street on many social network platforms. In retrospect however, there appears to be more at work here than simply the application of a new information technology. Unquestionably, there were significant increases in the number of social network users across the MENA during the period of the Arab Spring as Facebook reportedly gained six-million new users in the first six-months of Arab Spring protests. More importantly however, the number of new Arab Facebook users doubled from twelve-million to 24 million in the year prior to the outbreak of violence in Tunisia, perhaps indicating a less acute manifestation of public will.

Lisa Anderson, President of the American University in Cairo during the uprising, offers that associating the speed of technologically facilitated unrest distracts from the reality that there were long standing social and political issues that lay unresolved for years prior to the Arab Spring.²⁹ Anderson continues that there was little in common between the "rural protagonists in Tunisia, and the educated youth of Cairo," but the key elements of systemic corruption and a perceived inequity in both countries led to the

motivation for popular change.³⁰ Anthony Cordesman of the Center for Strategic Studies agrees while providing that long neglected social and political issues created the conditions for revolt in both Tunisia and Egypt. Moreover he also offers that a “youth bulge” amplified pattern neglect across the MENA. This pattern created a disenfranchised majority population unwilling to tolerate the endemic “corruption, cronyism and nepotism,” that defined much of the region.³¹

Such a youth bulge could also present a disproportionate manifestation of public protest on social networks as statistical data indicates that younger populations are more likely to adopt new technologies.³² Consequently, youth may use social networks more readily than traditional adult populations. Statistical data from the Dubai School of Government, *2011 Arab Social Media Report* supports these observations stating, “for many protestors [across the MENA] these social network tools were not central to the revolt, but that Facebook was an instrumental tool for a core number of activists who then mobilized wider networks through other platforms and established activist networks.”³³ This is an important distinction as the data provided by the Dubai school shows rapid user growth prior to the events of the Arab Spring, and the largest users increase was within the “youth bulge” referred to by Cordesman.³⁴

The events of the Arab Spring are difficult to generalize as each affected country has its own politics, but the underlying causes of the unrest in Tunisia and Egypt appear similar to factors in China and Iran. Public distrust of the government contributed to disenfranchisement and a lack of perceived transparency separated the public from their government, thus allowing opposition to exploit seams and foment unrest. Importantly, each of the cases provides a crucible for the examination of the role of new

technologically enabled communications mediums. Where governments acted or failed to act in response to a perceived issue or injustice, populations sought means to overcome barriers, thus increasing the utility of a new medium like technologically enabled social networking as a means to facilitate public protest. The statistical data from the 2010-2011 Dubai study showing increased usage of social networking technology may represent a gathering storm caused by declining public confidence in the governments of the MENA. Thus, the formation of social information networks garnering the exchange of resonating ideas was likely a natural reaction to the availability of a new and unconstrained, technologically enabled forum.

This process of forming social networks is what makes this medium so potentially powerful, as these forums provide interconnectedness regardless of proximity and organize non-hierarchically through information shared. Technologically enabled social networking is human social behavior, with the difference being that information transactions take place via an Internet platform vice a crowded marketplace. Research from decades before the Information Revolution identified this interaction of large groups of loosely affiliated people as vital to the functioning of society. However, social networking does more than merely facilitate interactions; social networks enable masses, as the following research will show.

Weak-ties and Dunbar's 150

Professor Mark Granovetter of Johns Hopkins University wrote his seminal piece on "weak-ties" in 1973, almost 30 years before the launch of Facebook.³⁵ His research demonstrated that small-scale social interactions (micro) can form large-scale patterns of social behavior (macro), and that interpersonal relationships provide an effective bridge from this micro to macro social transaction phenomenon.³⁶ He further offered that two

rudimentary relationships define societies, those bound by strong-ties (families and hierarchies) and those by weak-ties (friends and acquaintances). Strong-tie relationships differentiate from weak-ties though frequency (time), emotional intensity, mutual trust, and reciprocity.³⁷ These two fundamental types of interactions form the foundations of a society. While strong-ties are by far the more resilient of the two, social information transits along dispersed weak-tie networks more efficiently, thus providing the means by which rumors, news and information intermingle within societies.³⁸

Granovetter offered that diffusion studies show that “people rarely act upon mass-media information unless it is also transmitted through personal ties...otherwise people have no particular reason to think an advertised product or organization should be taken seriously.”³⁹ What he implied in this statement is that information is innocuous unless someone within a social network perceives its value and acts upon it, and further that information originating from strong-tie networks carries enhanced credibility due to the nature of the source. He concluded his paper that micro linkages within societies are indispensable as they form the fabric of social interaction that integrates strong-tie groups to the wider society and are therefore vital to the function of collective benefit derived from wider social groups.⁴⁰

Granovetter’s study explains the foundations for technologically enabled social networks and further provides that this new medium anchors upon fundamental human social behavior much the same way that news media, commercial markets and economic models anchor upon social interaction. Internet based social networks are weak-tie networks where information transits from micro to macro, thus weak-tie networks have advantage over mass-media information distribution in that weak-tie

relationships enhance information by the relationship of the sender. In other words, information on social networks has greater utility, as it is been evaluated and is seen as having value to the shared community or network.

Anthropologist Robin I. M. Dunbar of Oxford University provided in related research that the social function of group behaviors lies far deeper within our brains.⁴¹ His research of primate and human behavior lead him to the creation of the “Social Brain Hypothesis” that shows a correlation between volume of the neo-cortical region of the brain and the size of effective social groups.⁴² His research also expressed the relationship between direct interaction and the same value-added relationship of information derived from enhanced weak-tie communications. Dunbar predicted a fundamental core group size of 150 members of a weak-tie enhanced network given the volume of the human neo-cortex, while stating that the size of the group varies depending upon the personality of the individual, 150 members is the mean size of manageable external social relations.⁴³ He also stated that we intuitively place individuals beyond the core group into manageable categories based upon distance, frequency of contact, emotional closeness and potential reciprocity within the relationship.⁴⁴ Reciprocity potential also relates to altruistic behaviors in as much that we behave most selflessly within familial relations or Granovetter’s strong-tie clusters. Dunbar cites Granovetter’s work in explaining how information flows in and beyond the core group, citing how the frequency of interaction between groups affects the efficiency of information exchange.

Dunbar leveraged both his own research and the work of others to explain the general group size of military units, key corporate hierarchies, and even tribal systems

of extended familial relationships. The 150 group represents the average size of an extended weak-tie cluster where information efficiently flows and generates manageable organizational trust and confidence through direct and indirect exchange relationships.⁴⁵

Dunbar's research validated much of Granovetter's work. Importantly however, Dunbar adds an additional layer of complex interaction among weak-tie core networks, which potentially explains the appeal of technologically enabled social networks. If it is easy to access the core group without the requirement for being physically co-located (vis-à-vis face-to-face interaction), the group is free to exchange information at the time of their choosing, thus reducing the cost in terms of effort and increases perceived benefit from time invested. From a sociological and anthropological approach, social networking, be it technologically enabled or done the old-fashioned way, is part of our evolutionary programming or our so-called "wetware."⁴⁶

If technologically enabled social networks function via sociological predispositions to facilitate enhanced weak-tie information exchange, then this may explain why the SARS text warning, Iranian election protests and events of the Arab Spring expanded so rapidly. These events resonated along weak-tie networks, and that resonance enhanced the form and functionality of the social network. Unfortunately, for the governments involved in these events, the groundswell of resonant social conversation was negative and largely derived from a lack of trust and confidence in authorities to act upon the best interests of their populations. As both Granovetter's and Dunbar's research cited the importance of trust and reciprocal confidence as the fabric of both weak and strong-tie relationships, trust (be it political, organizational, or

institutional) becomes a key factor in the creation of public confidence and thereby support.

Organizational Trust, Visual Imagery and the Rise of Mobile Broadband

Organizational trust models build upon reciprocal interactions and transactions between trustors and trustees over time. This process generates perceived confidence that the trust relationship will continue to function as it has in the past. As a trust relationship is transactional and occurs over time, patterns of behavior serve to either reinforce perceptions of trustworthiness or diminish trust and confidence through outcomes. If the factors of trustworthiness (ability, benevolence, integrity) are the foundation for rational trust relationships, then these factors become vital to the creation and maintenance of public confidence and support. Organizations that require public support or confidence to function, like the U.S. Military, governments, and even commercial enterprises, the creation and maintenance of trust relationships with stakeholders and constituents are vital to effectiveness and future viability. However, as perceptions of actions and the consequent generation of trust are principally subjective and based upon how the trustee perceives the outcome of actions; the trust process incorporates both rational data and information along with emotional perceptions in cognitive evaluation of performance.⁴⁷ Therefore, organizations communicate with a degree of transparency to their stakeholders and constituents through both formal and informal methods in order to maintain relationships and engender continued support (Figure 2).

When organizations fail, either by their actions or by preventing transparency, public confidence and trust diminishes as stakeholders, constituents may begin to doubt the integrity of the organization. Consequentially, negative perceptions result. This basic

trust model provides insight as to how technologically enabled social networks transact resonant information so rapidly in restrictive political environments where public confidence and support is lacking. It is this rapid transaction of resonant information that Joint Force 2020 derives catalytic action from social networks. However, as each of the cases in China, Iran and the revolts of the Arab Spring implies an accelerating relationship to the manifestation of public unrest, something more than weak-tie networks may be involved in this rapid transaction of information.

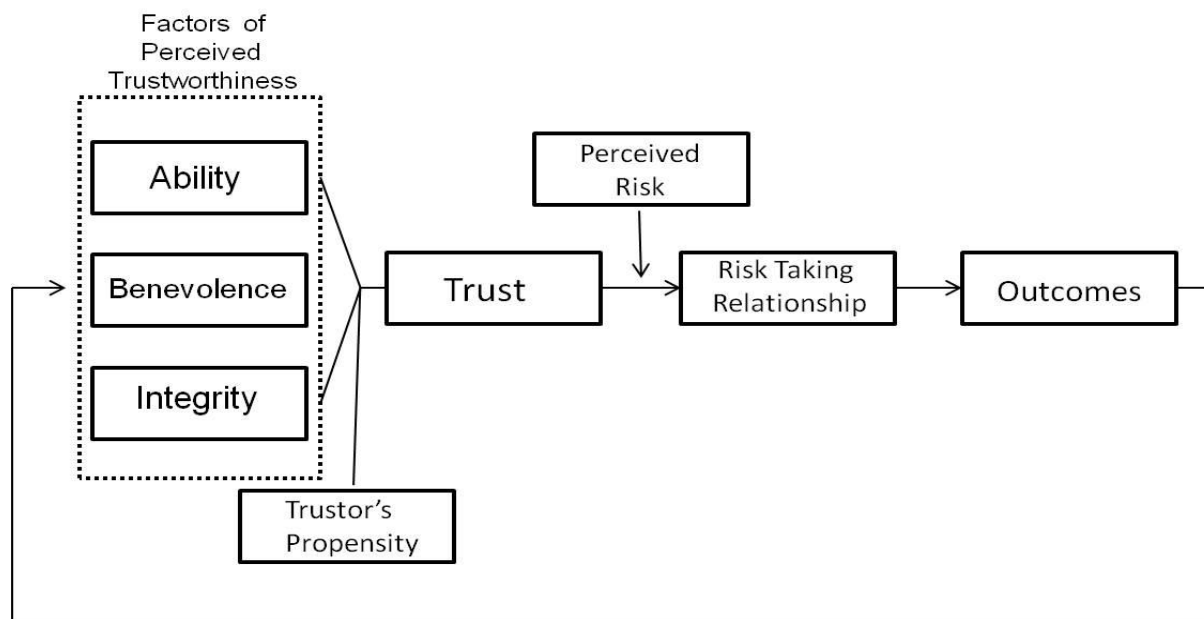


Figure 2. Proposed Trust Model from the Academy of Management⁴⁸

New research into the neurology of how audiences perceive visual imagery may provide an explanation as to why social networking appears to act as an accelerant and why Joint Force 2020 sees ubiquitous communications devices as a potential risk. A recent research study from Harvard University validated long held theories that people perceive visual information differently than forms of information and that images have a fast track to a part of the brain that makes emotional judgments.

According to Professor Joshua Greene, people process visual images emotionally in the ventromedial cortex of the brain, but the brain processes other forms of information like text and data in the more rational, prefrontal cortex.⁴⁹ The prefrontal cortex is the part of the brain that helps work out the difference between right and wrong in moral or ethical dilemmas, but the ventromedial cortex processes images emotionally with less logical evaluation.⁵⁰ Visual imagery supports good-of-the-one choices, while verbal and textual processing supports rational, utilitarian good-of-the-many decisions.⁵¹ In other words, visual information emotionally resonates with audiences more easily than other forms of information, as the brain perceives visual information within the emotional context of the viewer. This research likely explains why it is so difficult to mitigate consequences negative images that damage the credibility of an individual or organization. This also may explain why images of Iran's public protests and the self-immolation of Mohammad Bouazizi resonated so widely on social networks. As the source adds or detracts from the credibility of information, the weak-tie affiliations that define social networks may combine with the visceral nature of visual imagery to impart eyewitness credibility to the content distributed.

Joint Force 2020's additional concern that the spread of Internet enabled communications technologies may complicate or disrupt military missions relates directly to emotional vs. rational dynamic, especially if these new technologies support the wide transmission of visual imagery to global audiences. According to research from Cisco Inc., global Internet usage will increase 30 percent from 2011 to 2016, and mobile broadband usage will increase 83 percent by 2016, with the largest increases in mobile broadband usage occurring in the Asia Pacific, MENA and Latin America.⁵² Cisco's

global report also predicts 34, 35 and 52 percent increases in viewing video content, social networking and online gaming, respectively.⁵³ Comparing Cisco's usage data in context of a recent GSM Association report highlights the same exponential increase of global, mobile broadband connections (Figure 3).

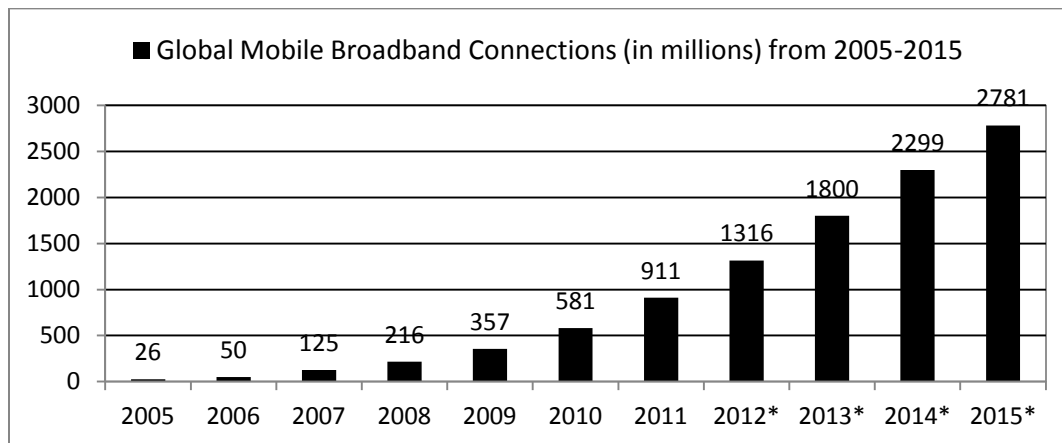


Figure 3. Global Mobile Broadband Connections from 2005-2015⁵⁴

The potential outcome of these trends is the creation of a globally accessible, social information environment that could factor in future military operations. As both the Cisco and GSM reports indicate increasing trends and growing appeal of rich-content visual information, the accelerating or catalytic action witnessed within technologically enabled social network activity in the MENA during the Arab Spring may portend a significant challenge for the Joint Force in future operations as public information may flow more rapidly than the force can react.

Military Considerations

Joint Force 2020 expresses concern about the convergence of technologically enabled social networks and the spread of Internet accessible, rich-content, smartphones, as these technologies have both positive and negative potential to affect the operating environment. At the strategic level, one potential opportunity that globally

accessible social networks provide is insight into the fora of weak-tie social interaction. As these networks are virtual public spaces, it is possible to measure public sentiment, support or even agitation holistically. A recently released RAND study investigated social network activity in Iran during the 2009 election unrest, and detailed the ebb and flow of Iranian public sentiment throughout the crisis.⁵⁵ Leveraging the availability of subject defined, Internet based, social networking content, the RAND study successfully measured Iranian public sentiment by tracking evocative or provocative word choice on public social networks.⁵⁶ This research along with other potential projects from research organizations like DARPA highlights potential opportunities to use social networks to gauge public sentiment by frequency of word choice within politically restrictive societies.⁵⁷ This research could be of potential value in dealing with rapidly developing security challenges, or measuring potential political volatility within populations. Consequently, the Joint Force needs to incorporate strategic-level, social network monitoring within its intelligence and human terrain analysis enterprise to assess public sentiment within external populations, identify potential volatility, and potentially provide advance warning of unrest and social instability.

At the operational level, risks associated with technologically enabled social networks and the accessibility of rich-content, mobile smartphones converge to create potential for a rudimentary, wide-array sensor environment capable of instantaneous distribution of information. Such a flexible public network could be of intelligence or propaganda value for an adversary. In much the same way that the Joint Force uses remotely piloted vehicles and other imagery platforms on the battlefield, an adversary could leverage mobile communications devices to provide both visual information and

data across a social network to provide a more complete intelligence picture of friendly force activity. The Joint Force would face a challenge in such a circumstance as efforts to disrupt adversarial use of mobile phone or Internet networks would also likely result in disruptions to other positive activities, like relief agencies, reliant upon mobile networks to coordinate aid efforts. In response to such dual-use challenges, Joint Forces at the operational-level need to improve, real-time, social network and mobile phone monitoring and information integration to provide early mitigation of potentially disruptive or hostile information so as to limit the utility of adversarial exploitation of public mobile networks.

Perhaps most critically, social networking has potential to affect one of the Joint Forces' most strategic centers of gravity, namely U.S. public support for military operations. A 2012 Nielson report on social media provides that Facebook hosts over 150-million U.S. users while Twitter has more than 37-million U.S. subscribers.⁵⁸ As the service members and leaders of the Joint Force are part of these populations, the Department of Defense's three-million service members and employees provide a valuable, weak-tie connection to its most important stakeholder; namely the U.S. population. While this linkage provides an opportunity to build public confidence and trust in the Joint Force, it also presents significant risk especially when misconduct undermines the credibility and legitimacy of the force.

If three factors of organizational trustworthiness are ability, benevolence, and integrity, then it is the responsibility of organizations to ensure that individual conduct and performance supports the manifestation of these factors. In the age of enabled social masses, demonstrating military capacity (ability), acting legitimately and

protecting people at risk (benevolence), and performing professionally (integrity) become Lines of Effort or a way of building organizational trust and confidence. In order for the Joint Force to enable both the positive aspects of organizational trust and public confidence as well as counter the negative effects of individual misconduct, every leader, service member and employee must assume responsibility for the stewardship of the larger institution. Hence, each Joint Force provider (Military Services) must improve their social network policies and train their members to be accountable as both individuals and representatives of the larger institution when both deployed abroad and while in garrison.

Consequently, actions - positive or negative - have the ability to affect the overall success of the mission and potentially the support of the U.S. public very rapidly. As such, the Joint Force should expect a significant increase in the number of misconduct reports resulting from the spread of these technologically enabled social networks. As these incidents reflect directly upon the professionalism and trustworthiness of the Joint Force, it becomes vitally important for leaders to investigate and resolve misconduct, rapidly, transparently, to the fullest extent possible. Long-standing legal information procedures and policies are robust and thoroughly tested, but in this new information environment, the social network court-of-public-opinion will conclude its findings based upon information available rather than the result of legal proceedings. Therefore, it is the responsibility of the Joint Force Commander, with advice from both the Military Judge Advocate and Public Affairs advisor to provide as much information as possible to the public, consistent with both privacy regulations and operational security requirements.

Joint Force 2020 recognizes that this new social network information environment has the potential to effect future military operations, but the Joint Force can do more to address the potential of technologically enabled masses. The Joint Force needs to improve monitoring, assessment and fusion of public information on these networks. Joint Force providers need to address individual social network training to improve service member engagement though weak-ties on behalf of the larger institution to improve transparency and build trust and confidence. Finally, the Joint Force needs to prepare for increased public scrutiny of actions both on and off the battlefield. With this new scrutiny comes a responsibility for the Joint Force to recognize positive actions and address misconduct rapidly, consistently and transparently, or face the consequences of a public asking for answers or worse demanding accountability.

Endnotes

¹ J. Christopher Herold, ed. *The Mind of Napoleon: A Selection from His Written and Spoken Words* (New York, NY: Columbia University Press, 1961): 64.

² John Godfrey Saxe, "The Blind Men and the Elephant," *The Poems of John Godfrey Saxe: Complete in One Volume* (Boston, MA: Ticknor and Fields, 1869): 259.

³ Manuel Castells, "The Network Society: From Knowledge to Policy," *The Network Society: From Knowledge to Policy*, Manuel Castells and Gustavo Cardoso ed., (Washington D.C.: Johns Hopkins Center for International Relations, 2005): 1.

⁴ Ibid.

⁵ Martin E. Dempsey, *Capstone Concept for Joint Operations: Joint Force 2020*, Joint Publication (Washington, DC: U.S. Joint Chiefs of Staff, September 10, 2012), 2-3.

⁶ Ibid.

⁷ Gary Anthes, "Quick Study: Making Microchips", *Computer World Online* (July 8, 2002), http://www.computerworld.com/s/article/72461/Making_Microchips (accessed December 5, 2012).

⁸ Adam D. Thierer, "How Free Computers Are Filling the Digital Divide," *The Heritage Foundation Online* (April 20, 2000), <http://www.heritage.org/research/reports/2000/04/how-free-computers-are-filling-the-digital-divide> (accessed December 5, 2012).

⁹ Derek Thompson, "The 100 Year March of Technology in 1 Graph," *The Atlantic Online* (April 7, 2012), <http://www.theatlantic.com/technology/archive/2012/04/the-100-year-march-of-technology-in-1-graph/255573/> (accessed December 7, 2012).

¹⁰ "The limits of leapfrogging," *The Economist Online* (February 7, 2012), <http://www.economist.com/node/10650775> (accessed December 3, 2012).

¹¹ Ibid.

¹² Ibid.

¹³ David Kelly, "Costs of Maintaining Stability in China," *East Asia Forum Online* (May 23, 2010), <http://www.eastasiaforum.org/2010/05/23/costs-of-maintaining-stability-in-china/> (accessed November 25, 2012).

¹⁴ Xeni Jardin, "Text Messaging Feeds SARS Rumors," *Wired Magazine Online* (April 21, 2003), <http://www.wired.com/medtech/health/news/2003/04/58506?currentPage=all> (accessed November 22, 2012).

¹⁵ John Pomfret, "Outbreak Gave China's Hu an Opening; President Responded to Pressure Inside and Outside Country on SARS," *The Washington Post*, May 13, 2003: A.01.

¹⁶ Kerry Dunbar, Wayne Morrison, "SARS, Avian Flu, and Other Challenges for China's Political, Social, and Economic Transformation," *Congressional Research Service Report for Congress Online* (February 12, 2004), <http://www.congressionalresearch.com/RL32227/document.php?study=SARS+Avian+Flu+and+Other+C> (accessed December 4, 2012).

¹⁷ "Revised U.S. Surveillance Case Definition for Severe Acute Respiratory Syndrome (SARS) and Update on SARS Cases ---United States and World Wide, December 2003," *Centers for Disease Control Online* (December 12, 2003), <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5249a2.htm> (accessed January,13, 2013).

¹⁸ Web 2.0: Is and commercial term referring to interactive peer to peer communication utilizing Internet based Social Network Services (SNS) software applications. The differentiation between "Web 2.0" and "Web 1.0" (static websites and pages) is the use of software to create interactive, conversational environments seen as adding value via input and context through a communications transaction. Web 2.0 platforms converged with the development of next generation, content-rich; mobile phone technology as is seen as contributing to the wide popularity of Internet enabled Smart Phones. For more information on Web 2.0, see Richard McManus, "What is Web 2.0", *ZD Net Online* (September 7, 2005), <http://www.zdnet.com/blog/web2explorer/what-is-web-2-0/5> (accessed December 6, 2012). Facebook: Launched in 2004, Facebook is an Internet based social networking application where users establish an individualized page where they can select and post content or information (text, pictures, videos and third party content, updates) and communicate directly with other selected users or "friends" free of charge. According to Facebook's current press information, over 1 billion people and businesses use the platform. For more information on Facebook, see their newsroom page at <http://newsroom.fb.com/Key-Facts> (accessed December 6, 2012).

Twitter: Launched in 2006, Twitter is an Internet based social networking application where users can electronically comment upon personal activities or comment upon topical issues using “hashtag or #” identification in real-time conversation and free of charge. Twitter users comments are limited to 140 textual characters in their posts, but they can also use twitter to post and distribute digital photographs or Internet links to video content hosted outside the Twitter platform. According to Twitter, they currently have over 140 million users who “tweet” 340 million times daily in 20 languages. For more information on Twitter, see <https://business.twitter.com/en/basics/what-is-twitter/> (accessed December 6, 2012).

Flickr: Launched in 2004, Flickr is an Internet based social networking application where users can post, manage and share digital images and some limited video content. Users may post up to 300 megabytes of digital photo content free of charge, but larger accounts are available for a fee. According to Flickr, they currently have 90 million users per month. For more information on Flickr, see <http://www.flickr.com/about/> (accessed December 6, 2012).

YouTube: Launched in 2005, YouTube is an Internet based social networking application where users can post unlimited digital video content for either general Internet viewing or through user hosted Internet “channels” of personal and third party content. Users can comment or “like” content they see thus allowing easier recognition of popular content. According to YouTube, over 4 billion viewers watch YouTube content daily and 72 hours of video content upload every minute. For more information on YouTube, see <http://www.youtube.com/t/press> (accessed December 6, 2012).

¹⁹ Hooman Majd, “Think Again: Iran’s Green Movement,” *Foreign Policy Online* (January 6, 2012), http://www.foreignpolicy.com/articles/2010/01/06/think_again_irans_green_movement (accessed November 25, 2012).

²⁰ Ibid.

²¹ Twitter is application software designed to allow users to share publicly posted messages and images in real-time much as one would in a conversation with one or more people. For more information see “Twitter Guide Book -How To, Tips and Instructions by Mashable” *Mashable Online*, <http://mashable.com/guidebook/twitter/> (accessed December 15, 2012).

²² Ira Sager, “Before the iPhone and Android Came the Simon, the First Smart Phone,” *Bloomberg Business Week Online* (June 29, 2012), <http://www.businessweek.com/articles/2012-06-29/before-iphone-and-android-came-simon-the-first-smartphone> (accessed December 6, 2012).

²³ “Iran Blocks TV, Radio, and Phones-But The Web Proves More Difficult,” *The Guardian Online* (June 15, 2009), <http://www.guardian.co.uk/technology/2009/jun/15/iran-jamming-technology-tv-radio-internet> (accessed December 6, 2012).

²⁴ Lachlan Carmichael, “US Asks Twitter to Maintain Service After Iran Vote: Official,” *Agence France Presse (AFP) Online* (June 16, 2009), <http://www.google.com/hostednews/afp/article/ALEqM5jxRTCxOmFcVVpTkAoeQsIDQK5z7g> (accessed December 6, 2012).

²⁵ James Jay Carafano, “All a Twitter: How Social Networking Shaped Iran’s Election Protests,” *The Heritage Foundation Online* (July 20, 2009),

http://www.heritage.org/research/reports/2009/07/all-a-twitter-how-social-networking-shaped-irans-election-protests#_ftn20 (accessed, December 6, 2012).

²⁶ Neal Ungerlied, "Iran's Second Internet Rivals Censorship of China's Great Firewall," *Fast Company Online* (February 23, 2012), <http://www.fastcompany.com/1819375/irans-second-internet-rivals-censorship-chinas-great-firewall>, (accessed November 23, 2012).

²⁷ Kareem Fahim, "Slap to a Man's Pride Set Off Tumult in Tunisia," *New York Times Online* (January 21, 2011), <http://www.nytimes.com/2011/01/22/world/africa/22sidi.html?pagewanted=1&r=2&src=twrhp>, (accessed December 2, 2012).

²⁸ "Arab spring: an interactive timeline of Middle East protests," *The Guardian Online* (January 5, 2012), <http://www.guardian.co.uk/world/interactive/2011/mar/22/middle-east-protest-interactive-timeline> (accessed December 2, 2012).

²⁹ Lisa Anderson, "Demystifying the Arab Spring," *Foreign Affairs Online* (May/June 2011), <http://www.foreignaffairs.com/articles/67693/lisa-anderson/demystifying-the-arab-spring>, (accessed December 2, 2012).

³⁰ Ibid.

³¹ Anthony Cordesman, "Rethinking the Arab Spring," *Center for Strategic and International Studies Online* (November 8, 2011), http://csis.org/files/publication/111102_MENA_Stability_Security.pdf (accessed December 8, 2012).

³² Racha Mourtada, Fadi Salem, "Civil Movements: The Impact of Facebook and Twitter," Dubai School of Government, *Arab Social Media Report #1 Online*, (May 2011): 4, [http://www.dsg.ae/\(X\(1\)A\(MJU7hk87zgEkAAAAZDQyMTg5ZDktYWMwNC00YWwNkLWJjMTEtMDI2MzZlNTFkYWUz2APprKKBylu1bHvpo15YdKbl_p01\)\)/en/publication/Description.aspx?PublD=236&PrimenuID=11&mnu=Pri](http://www.dsg.ae/(X(1)A(MJU7hk87zgEkAAAAZDQyMTg5ZDktYWMwNC00YWwNkLWJjMTEtMDI2MzZlNTFkYWUz2APprKKBylu1bHvpo15YdKbl_p01))/en/publication/Description.aspx?PublD=236&PrimenuID=11&mnu=Pri) (accessed February 6, 2012).

³³ Ibid., 5.

³⁴ Ibid., 13.

³⁵ Mark S. Granovetter, "The Strength of Weak Ties," *American Journal of Sociology*, Vol 78, No. 6, (May 1973): 1360.

³⁶ Ibid.

³⁷ Ibid., 1361.

³⁸ Ibid.

³⁹ Ibid., 1374.

⁴⁰ Ibid., 1378.

⁴¹ Robin I. M. Dunbar, "Constraints on the Evolution of Social Institutions and Their Implications for Information Flow," *Journal of Institutional Economics, suppl. Evolutions of Institutions*, Vol. 7, Issue 3, September 2001, (UK: Cambridge University Press): 1.

⁴² Ibid.

⁴³ Ibid.

⁴⁴ Ibid., 2.

⁴⁵ Ibid.

⁴⁶ Ibid.

⁴⁷ Ibid., 712.

⁴⁸ Roger C. Mayer, James H. Davis, F. David Schoorman, "An Integrative Model of Organizational Trust," *Academy of Management Review*, Vol. 20, No. 3 (July 1995): 715.

⁴⁹ Steve Inskeep "Why Mental Pictures Can Sway Your Moral Judgment," *National Public Radio Transcript Online* (September 20, 2012), <http://www.npr.org/2012/09/20/161440292/why-pictures-can-sway-your-moral-judgment> (accessed October 13, 2012).

⁵⁰ Ibid.

⁵¹ Ibid.

⁵² Cisco Inc., "Cisco Visual Networking Index: Forecast and Methodology, 2011-2016," *Online* (May 30, 2012): 8, http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360_ns827_Networking_Solutions_White_Paper.html (accessed December 13, 2012).

⁵³ Ibid., 9.

⁵⁴ "Latin America Mobile Observatory 2011: Driving Economic and Social Development Through Mobile Broadband," *GSM Association Online* (February 2, 2012): 22, <http://www.gsma.com/latinamerica/latin-america-mobile-observatory> (accessed December 13, 2012).

⁵⁵ Sara Beth Elson, Douglas Yeung, Parisa Roshan, S.R. Bohandy, Alireza Nader, "Using Social Media to Gauge Iranian Public Opinion and Mood After the 2009 Election," *RAND National Security and Research Technical Report Online* (2012), http://www.rand.org/pubs/technical_reports/TR1161.html (accessed February 6, 2012).

⁵⁶ Ibid.

⁵⁷ Rand Waltzman, "Social Media in Strategic Communications," DARPA Information Innovation Office, Statement of Requirement and Solicitation Online (July 14, 2011)

[http://www.darpa.mil/Our_Work/I2O/Programs/Social_Media_in_Strategic_Communication_\(SMISC\).aspx](http://www.darpa.mil/Our_Work/I2O/Programs/Social_Media_in_Strategic_Communication_(SMISC).aspx) (accessed February 6, 2012).

⁵⁸ “State of the Media: The Social Media Report-2012,” *Nielson Online* (2102), <http://blog.nielsen.com/nielsenwire/social/2012/> (accessed February 10, 2012).