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THESIS

**THE POTENTIAL TRANSFORMATIVE IMPACT OF WEB
2.0 TECHNOLOGY ON THE INTELLIGENCE
COMMUNITY**

by

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December 2008

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**THE POTENTIAL TRANSFORMATIVE IMPACT OF WEB 2.0 TECHNOLOGY
ON THE INTELLIGENCE COMMUNITY**

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ABSTRACT

Web 2.0 technologies can transform and improve interagency collaboration in the Intelligence Community in many of the same ways that have marked their use through the internet in the public domain and private industry. The potential for success is illustrated in the early stages of ODNI's implementation of the Analytical Transformation program within the sixteen agencies across the Intelligence Community. Intelligence analysts have already seen an impact in their ability to connect, share information, conduct research and analysis utilizing a suite of web 2.0 technology, including Intellipedia and A-Space. However, adoption of the technology in the Intelligence Community will not be without challenges, including a number that are unique to Intelligence Community. Those challenges include the need for the Intelligence Community to move away from a "need to know" culture towards a "responsibility to provide" culture, a need for increased promotion of these tools and a need for training on web 2.0 technology.

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I. INTRODUCTION

A. PROBLEM STATEMENT

In response to recommendations made by the 9/11 Commission, the Office of the Director of National Intelligence (ODNI) launched an initiative to build an architecture for online Intelligence Community (IC) collaboration using web 2.0 technologies. This three year initiative, called the Analytic Transformation Program (AT), aims to promote interagency collaboration through the use of social networking tools. Through that promotion, the AT will attempt to change not just the functional execution of the analytic mission, but the enterprise supporting the mission as well. The AT should be successful provided it can emulate the success in the private sector and elsewhere in the public sector resulting from the widespread use of web 2.0 technologies.¹

Based on a review of experiences in the private industry and public domain, ODNI envisions the web 2.0 components of the AT to be voluntary, low cost, tolerant of early failures and rapidly adapting. There are, however, specific challenges associated with the application of these concepts to the IC. Those challenges were evident in the IC's 2006 launch of Intellipedia, the IC's version of Wikipedia: the product was welcomed enthusiastically by the IC but lingering skepticism among many of its members thwarts its growth. The ODNI must develop ways to promote Intellipedia's use, convincing members of the IC of the valuable information contained therein, and its utility in analytical tradecraft.

This thesis examines the potential impact of the adoption of new web 2.0 technologies by the IC. This examination includes: (i) a review of the new threat environment; (ii) an analysis of the role of web 2.0 technology within the newly established Information Sharing Environment (iii) a consideration of cultural barriers that could hinder its adoption. The author identifies and analyzes successful models of technology adoption in private sector industries and the public domain, and makes

¹ This thesis will be structured using "appreciative inquiry," with the success of similar programs in the private sector as the guide.

recommendations for building a governance structure that will enable IC members to engage in the development and implementation of web 2.0 technologies to emulate their successes.

B. RESEARCH QUESTIONS

This thesis examines whether and how web 2.0 technologies can transform and improve interagency collaboration in the IC in many of the same ways that have marked their use through the internet in the public domain and private industry. Specifically it addresses:

1. What program(s) is ODNI implementing to improve information sharing within the Intelligence Community (IC) in response to the 9/11 report and the 2004 Terrorism Act?
2. What is the current status of information sharing within the IC? What are the most significant concerns of ODNI with respect to implementing cultural changes inside the IC?
3. How will adoption of web 2.0 technology and innovation improve the current situation?
4. What are the policies in place? What policies need to be developed?
5. What are the anticipated failures/problems?
6. What best practices can be taken from successful adoption models in private industry and applied to the IC?

C. RESEARCH METHODOLOGY

The research was conducted using appreciative inquiry, and will highlight the success of web 2.0 deployment in the private sector and government as the guide for the IC. Appreciative inquiry is a process for documenting and catalyzing positive change; it focuses on positive attributes in systems and seeks ways to replicate them. It involves gathering information using a process based on provocative questions.² Appreciative inquiry is appropriate because the research requires a study of successful deployment of

² Diana Whitney and David Cooperrider. (2003) *The Power of Appreciative: A Practical Guide to Positive Change*. Berrett-Koehler Publishers: San Francisco.

web 2.0 technology within the public and private sector in order to show the potential for successful replication of the technology within the IC. Table 1 below illustrates the methods used for information gathering as they pertain to each research question listed in the above section.

Table 1. Thesis Sources

Source	Question #1	Question #2	Question #3	Question #4	Question #5	Question #6
Interviews	X	X	X	X	X	X
Media Reports	X	X	X	X	X	X
Journal Report			X			X
Government Policy Document	X	X		X		
Podcasts		X	X			
Blogs	X	X	X	X	X	X
Books	X	X	X		X	X
Vodcasts	X		X		X	X

The biggest obstacle to conducting the research was the request of all interviewees that their input be attributed anonymously. All individuals interviewed were members of the IC and wished to provide input without attribution. Although this posed difficulty in providing attribution to a significant source of information, the combination of the interviewee input with the publicly available interviews with IC members published in media reports and journals provided sufficient substantive information to answer the research questions.

D. BACKGROUND ON WEB 2.0 TECHNOLOGIES

To put such questions in the proper context, the transformative changes in internet use resulting from web 2.0 technology must be understood. The emergence of web 2.0 technology ushered in a new era for both developers and end-users. That technology prompted the web to evolve from a platform for static text into one that facilitates dynamic, interactive web applications; that evolution has transformed its functionality, adaptability, and usability. The internet has become a tool that can be used by

individuals not just to gain knowledge, but also to create value and share resources. As a result, individuals now have as much impact on changes to web sites as the authors. For example, end users have created and maintained what is now the world's largest encyclopedia: Wikipedia. Individuals, particularly those in the younger generations, network and interact with each other in a radically different way using social networking sites, such as Myspace, Facebook, and LinkedIn. The end users' ability to control content by posting and sharing information in order to build applications is the key component to this revolution. This ability to mass collaborate has led to the emergence of attributes, structures and capabilities that did not exist before the emergence of web 2.0 applications.³

As a result, the internet is no longer about passive browsing of internet pages ; rather it has become a powerful force in modern day society as individuals use it increasingly to shop, socialize, date, network, collaborate and create loosely connected communities. Web 2.0 applications will cause similar transformative changes within the IC, which has struggled in the post 9/11 era to enhance its collaboration and information sharing capabilities. Indeed, when put to the proper use, web 2.0 applications will help the IC enact one of the recommendations of the 9/11 Commission, namely that, "Information procedures should provide incentives for sharing, to restore a better balance between security and share knowledge."⁴

³ Don Tapscott and Anthony Williams. (2006). *Wikinomics: How Mass Collaboration Changes Everything*. Portfolio.

⁴ National Commission on Terrorist Attacks Upon the United States (2004). *The 9/11 Commission Report*. Washington, D.C.: Government Printing Office.

II. LITERATURE REVIEW

The body of published materials relevant to this thesis includes numerous studies, reports and literature produced in the form of government reports, news articles, journal articles, and scholarly books. In general, the available literature addresses three primary subjects: (i) models of technology adoption, diffusion and innovation, (ii) web 2.0 technologies and their impact on private industry and public internet usage and (iii) reform efforts and strategies to improve information sharing, collaboration and access within the IC. A common theme in the literature is that adoption of technology and innovation is critical for an organization to move forward. Another motif is the powerful impact that web 2.0 technologies can have in causing individuals to self organize, access and share information; this is most obvious in the case of social networking. The literature strongly supports the criticality of adopting web 2.0 technologies as early as possible in order to effect change within an organization or community; that early change spawns the critical mass of early adopters necessary to realize the benefits of the new technologies.⁵

A. GOVERNMENT REPORTS

Government reports, including reports addressing intelligence reform legislation, comprise a significant portion of the existing literature because those reports are designed to address the status of reform efforts to improve information sharing within the IC. They also include guidance on mandates for reform within the IC. For example, the 9/11 Commission's final report stressed the importance of implementing mechanisms for improved terrorist-related information sharing within the government. The 9/11 Commission recommended establishing a procedure that would provide incentives for information sharing to restore a better balance between security and shared knowledge. The Commission also called upon the president to lead a government wide effort to overcome legal, policy and technical issues to create a "trusted information network" to

⁵ D. Calvin Andrus. (2005). The Wiki and the Blog: Toward a Complex Adaptive Intelligence Community. *Studies in Intelligence* 49, no.3.

share vital intelligence among agencies charged with domestic security. As a result, ODNI launched the Information Sharing Environment (ISE) program, of which the AT is a major component.⁶ Government reports are important to understanding whether and how government recommendations for reform can be discharged through web 2.0 technologies.⁷

B. NEWS ARTICLES

News articles also provide a wealth of relevant information because many are informative, timely pieces that often contain interviews with major figures. An example of an informative news article is Tim O'Reilly's "What is Web 2.0: Designing Patterns and Business Models for the Next Generation." O'Reilly published the article in 2005, and helped establish a timely and evolving definition of Web 2.0 technology by analyzing its genesis and early growth. He describes Web 2.0 as "a set of principles and practices that tie together a veritable solar system of sites that demonstrate some or all of those principles, at a varying distance from that core."⁸ Web sites using web 2.0 applications gain value as more people use it. The value is added through what is known as an "architecture of participation," a built-in ethic of cooperation, in which the service acts primarily as an intelligent broker, harnessing the power of the users themselves.⁹ This increase in value leads to network externalities whereby the more individuals that use web sites featuring web 2.0 applications, the more value is attributed to the web site. For example, wikipedia is only as good as its contributors and consumers.¹⁰

As O'Reilly explained, Web 2.0 has expanded the capabilities of end-users by facilitating creativity, collaboration and sharing. It is not considered to be an update to

⁶ The ISE coordinates information sharing across multiple Communities of Interest (COI), multiple users and various governmental and non-governmental agencies with differing missions.

⁷ National Commission on Terrorist Attacks Upon the United States (2004). *The 9/11 Commission Report*. Washington, D.C.: Government Printing Office.

⁸ Tim O'Reilly. (2005, September 30). *What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. Retrieved December 1, 2007
<http://www.oreilly.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>.

⁹ Ibid.

¹⁰ Peter Newman. (1998). *The New Palgrave's Dictionary of Economics and the Law*. Palgrave MacMillan: New York.

technical specifications, rather it represents a dramatic change in the ways software developers and end-users use and view the internet. In essence, Web 2.0 applications have morphed the internet into a multi-dimensional tool with expanded capabilities that enhance the end user's experience.

C. JOURNAL ARTICLES

There is a plethora of journal articles addressing a number of subjects related to this thesis in a fairly detailed fashion. For example, in the scholarly journal, *Studies in Intelligence*, Calvin Andrus published a pioneering article that identified changes the author believed the IC should make to transform it into a community that “dynamically reinvents itself by continuously learning and adapting as the national Security environment changes”. Andrus believes wikis and blogs are two examples of self-organizing entities that are complex adaptive systems capable of self-organization, emergence, relationships, feedback, adaptability, and non-linearity. He theorized that several conditions must exist in order for the IC to dynamically reinvent itself and provides a recommendation on how the IC must evolve to become a complex adaptive system. Andrus's ideas are some of the first to apply web 2.0 technology to the IC; he provides a detailed picture of the merits of Wikipedia and suggests that implementing its IC counterpart, Intellipedia, will result in a significant paradigm shift across the IC.¹¹ Andrus's prediction that the IC will fall quickly behind if it does not adopt innovation, is still as true now as it was when he wrote the article in 2005. Yet there are a number of areas warranting consideration that Andrus left unexplored, and a number of developments that occurred since the publication of Andrus's article that must be analyzed in depth. For example, a whole body of evidence has emerged in the last two years on the dire need for the IC to adopt web 2.0 technology; evidence that will be explored in depth below. Also considered below are examples of successful technology adoption in the public domain and private industry; those examples are examined in an appreciative inquiry fashion, in order to build a complete picture.

¹¹ D. Calvin Andrus. (2005). The Wiki and the Blog: Toward a Complex Adaptive Intelligence Community. *Studies in Intelligence*, 49,(3).

The scholarly article “Web of Influence” authored by Drezner and Farrell (2004) addresses the incredible tour de force blogging has become in public and private domains.¹² It also provides evidence of the powerful impact individuals have in cyberspace when they use blogs as a way to disseminate views, opinions, information and data. Blogging, once thought of as a hobby, has evolved into a new medium that is changing the journalistic and policy landscape. This article provides data and details on increased blog usage, the rise of blogs in influence over the media and their long-ranging impact on readership. Just as blogging makes powerful waves in the virtual world that translate to the real world, blogging holds major potential for individuals in a variety of capacities within the IC (stationed abroad, at headquarters or in the field) to disseminate information, opinions, and views.

Andrew McAfee (2006) of Harvard business school wrote an instructive article on the collective power of wikis, blogs, and group messaging software in transforming a corporate intranet into a constantly changing structure built and distributed by autonomous peers.¹³ He deems them noteworthy because they knit together an enterprise and facilitate knowledge work¹⁴ in ways that were not possible previously. To make his point, he reviews the shortcomings of technologies currently used by knowledge workers, and examines how the newly available technologies address these drawbacks. A similar analysis of the IC will be done below. McAfee also makes a valuable point regarding the dangers of Wikipedia, noting that people with very different backgrounds and perspectives will collaborate and could generate content of questionable productivity. The danger associated with competing information and perspectives, however, is tempered by a kind of collaborative compromise that McAfee posits is unprecedented. It is this kind of productive convergence that we strive for in the IC, but one challenge to accomplishing this unique to the community is skepticism over lack of vetting of information; that challenge will be explored below.

¹² Daniel W. Drezner and Henry Farrell (2004). Web of Influence. *Foreign Policy*, 148.

¹³ Andrew P. McAfee. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. *Sloan Management Review*, 47(3).

¹⁴ Knowledge work refers to the compilation of tacit knowledge and information.

McAfee also writes of two distinct kinds of engineering that are occurring: technical and social. With regard to the former, a key innovation is the ability for anyone not just to contribute, but also to edit or remove the contributions of others. The latter creates a cooperative and helpful culture in which most decisions are made by consensus among senior members of the community.¹⁵ McAfee's observations on the potential for success and failure as to knowledge workers are transferable in many ways to ODNI's efforts to implement the AT.

The Economist Intelligence Unit conducted an on-line survey of senior executives around the world on the impact of Web 2.0 technology on their businesses, and the results provide an interesting perspective on the potential of such technology. The survey was supplemented with in-depth interviews of senior executives across a range of industries. The survey's findings provide evidence that Web 2.0 technology has utilized community development to transform organizations. Almost 4 out of every 5 executives surveyed recognized that the sharing and collaboration aspects of Web 2.0 presented an opportunity to increase the revenues of their companies. Moreover, 60 percent of the large companies in the survey responded that they invite customers to contribute to content that explains, supports, promotes or enhances their product, or that they plan to do so in the future.¹⁶ The survey results support my hypothesis that greater involvement leads to enhanced collaboration and information sharing; in the business world, that results from customer involvement and in the IC, which will come through community member involvement. For example, the ability for customers to provide feedback and commentary to businesses on a product is valuable and contributes to the overall value of the product. Similarly, IC members (such as government agencies, intelligence analysts, etc.) will add value to intelligence products and may act as a catalyst to positive change if they are able to comment on finished products through online discussions and blogs.

In the National Geospatial Agency's (NGA) journal, *Pathfinder*, NGA published an article on the success of early adoption of Intellipedia. The article "Intellipedia Shows

¹⁵ Andrew P. McAfee. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. *Sloan Management Review*, 47(3).

¹⁶ Economist Intelligence Unit. (2007). Serious Business. Web 2.0 Goes Corporate.

Revolutionary Promise” addresses the resistance ODNI has experienced regarding the launch of Intellipedia from the IC and provides statistical data with regard to who the early adopters are within the IC. NGA is the agency with the second most intellipedia users in the IC after the ODNI.¹⁷ The article describes Intellipedia’s value as a tool for NGA analysts and how it helps NGA reduce both the amount of redundant finished intelligence products and reliance on isolated point-to-point communication (such as e-mail).

D. SCHOLARLY BOOKS

In *Unleashing the Killer App*, authors Larry Downes and Chunka Mui look at the dynamics of technological change and its potential to create ‘killer apps.’¹⁸ The authors describe a “killer app” as a product or service that “wind[s] up displacing unrelated older offerings, destroying and re-creating industries far from their immediate use, and throwing into disarray the complex relationships.”¹⁹ Downes and Mui argue that the dominant trend behind the proliferation of killer apps is a combination of Moore's Law, which states that the processing power of the CPU doubles every 18 months, and Metcalfe's Law, which observes that the value of a network increases dramatically with each node that is added to it. These two laws are fundamentally changing how businesses interact with each other and with their customers. To exploit these changes, the authors outline 12 points for designing a digital strategy to help identify and create killer apps in an organization. These 12 points are helpful in designing a strategy to implement Web 2.0 technology adoption within the IC.

In his landmark book, *Diffusions of Innovation*, Everett Rogers provides comprehensive coverage on the elements of diffusion, the history of diffusion research,

¹⁷ Dawen Eilenber. (2006, March/April). Intellipedia Shows Revolutionary Promise. *Pathfinder*, 5.

¹⁸ A “Killer App” is defined in this context as a new good or service that single-handedly rewrites the rules of an entire industry or set of industries. In this context, web 2.0 technology may be considered a killer app because it enables an organization to interact, collaborate and share information in ways not previously possible.

¹⁹ Larry Downes and Chunka Mui. (1998). *Unleashing the Killer App: Digital Strategies for Market Dominance*. Cambridge, MA: Harvard Business School Press.

generators of innovation, change agents and the consequences of innovation.²⁰ He provides valuable strategies for social marketing, forecasting the rate of adoption, technology transfer, and more. This book is instructive regarding best practices for implementation of new technologies within the IC.

In *The Tipping Point*, Malcolm Gladwell defines the precise moment when something becomes a trend, and offers examples by probing beyond the surface of everyday occurrences. In doing so, Gladwell reveals a number of surprising dynamics behind explosive social changes. He examines the power of “word-of-mouth” exchanges, and explores how very small changes can directly affect popularity. Gladwell likens the spread of ideas and behaviors to that of the spread of a virus, and offers strategies to invoke such a spread for positive effect.²¹ A number of Gladwell’s observations provide useful direction in analyzing how to reach the necessary “tipping point” of acceptance of Web 2.0 technologies in the IC.

²⁰ Everett M. Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. New York, NY: Free Press.

²¹ Malcolm Gladwell. (2002). *The Tipping Point: How Little Things Make a Big Difference*. New York: Little Brown Company.

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III. A NEW THREAT ENVIRONMENT

Today's principal threats are far more decentralized than any in our nation's history. They do not come from contained nation-states like the Soviet Union or Nazi Germany. That is not to say that nation states, such as Iran or North Korea, are not important forces in today's threats but rather terrorist threats today tend to transcend national boundaries. One lesson that the United States government (USG) has learned from the Iraq war is that direct military conflicts between organized armies are only a microcosm of the threats to national security we face today. The decentralized nature of the asymmetrical threat of terrorism has profound implications on how the USG must strategize to counter the actions of our enemies.²²

In the post-9/11 era, enemies are no longer fixed institutions where flows of materials, factories, military installations and other targets of investigation are easily studied by small, centralized groups of intelligence analysts focusing on one steady stream of information. In today's threat environment, intelligence is received as bits and pieces of disparate information, such as border crossings, purchase of weapons, newspaper reports, and transfers of money.²³ This data must be viewed together to collectively paint a picture of a greater threat. These are the so-called "dots" that must be connected in order for intelligence to work to reduce threats in today's environment.

Monitoring the flow of inherently disparate pieces of information is very different from watching the Soviets load tanks on trains or analyzing the shapes of screws on a Soviet submarine. Instead, valuable intelligence in today's threat environment must be gleaned by linking both finished intelligence and seemingly innocuous reports from IC members, Federal, state and local law enforcement and the private sector. For example, a State Department report containing information on student visa requests from two foreign nationals could be linked to a report filed by local law enforcement of suspicious activity

²² National Commission on Terrorist Attacks Upon the United States (2004). *The 9/11 Commission Report*. Washington, D.C.: Government Printing Office.

²³ Ibid.

conducted by foreign students in the basement of a home if those pieces of information were shared in a space accessible across the IC, as well as its federal, state and local partners.

In order to respond properly to the new threat environment by connecting disparate pieces of information, the IC needs to establish a sustainable, far-reaching solution that will involve a significant shift in culture, process flow, and upgrade in technology and knowledge management. A significant component of that solution will be use of web 2.0 technology to reduce the barriers to sharing information; the technology also will provide a medium for members of the IC to use to reengineer work flow, and re-define channels of information.

A. THE UTILITY OF WEB 2.0 IN THE NEW THREAT ENVIRONMENT

Web 2.0 technology offers a new, dynamic way to share and disseminate information that the IC should be able to use to easily link seemingly disparate pieces of intelligence such as those described in the hypothetical above. The term “web 2.0,” was introduced during a web conference hosted by O’Reilly Media and refers to a second generation of web-based communities and hosted services, such as social networking sites, wikis, mashups and folksonomies.²⁴ As the web is considered a platform, web 2.0 lacks concrete boundaries; instead, it possesses a gravitational core. Tom O’Reilly described it as “a set of principles and practices that tie together a veritable solar system of sites that demonstrate some or all of those principles, at a varying distance from that core.”²⁵ Web sites using web 2.0 applications gain value as more people use it. The value is added through an “architecture of participation”, a built-in ethic of cooperation, in which the technology acts primarily as an intelligent broker, harnessing the knowledge of the users themselves.²⁶ Web 2.0 has expanded the capabilities of end-users by facilitating creativity, collaboration and sharing. It is not considered to be an update to

²⁴ Please see Appendix for a definition of these terms.

²⁵ Tim O’Reilly. (2005, September 30). *What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. Retrieved December 1, 2007
<http://www.oreilly.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>.

²⁶ Ibid.

technical specifications; instead it represents a dramatic change in the ways software developers and end-users use and view the internet. In essence, web 2.0 applications have morphed the internet into a multi-dimensional tool with expanded capabilities that enhance the end user's experience.²⁷

New web applications (such as weblogs (blogs), social bookmarking, wikis, podcasts, RSS feeds) and online web services (such as eBay and Gmail) have signaled a new era of enhancement over read-only websites. The new era is marked by the end-user's significant control over web content. This new ability provides for real-time interactivity, as individuals are able to upload and download information to web sites. This new capability enables websites to evolve from isolated information silos to interlinked computing platforms that act like software to the user.²⁸

The real-time interactivity has introduced a valuable social element to internet usage, in which users generate and distribute content, often with freedom to share and re-use.²⁹ Individuals are able to communicate in real time by sending instant messages, trading files, watching streaming video, and "tweeting."³⁰ It has created a culture in which user participation builds upon itself by leading to the development of better web sites, motivating even more users to participate. As a result, users view web sites using web 2.0 applications as valuable resources from which they can both extract and add information.³¹

As the IC moves forward in the face of the new threat environment, and in its efforts to improve information sharing and collaboration through the deployment of Web 2.0 technology, it will vastly improve its ability to form connections and make linkages

²⁷ Tim O'Reilly. (2005, September 30). *What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. Retrieved December 1, 2007
<http://www.oreilly.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>.

²⁸ Ibid.

²⁹ Ibid.

³⁰ Tweeting is a term used by individuals who use the Web 2.0 technology "Twitter". See Appendix A for a definition.

³¹ Tim O'Reilly. (2005, September 30). *What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. Retrieved December 1, 2007
<http://www.oreilly.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>.

that were previously unlikely. These new channels of information flow will lead to an improvement in “connecting the dots,” and ultimately could avert another intelligence failure similar to the one that occurred in the months leading up to September 11, 2001. In the following pages, the author will discuss the reform efforts made by the IC in light of the new threat environment, to improve the way intelligence is shared, information is disseminated and the manner in which IC agencies interact.

B. INFORMATION SHARING ENVIRONMENT

The Information Sharing Environment (ISE) was established as a result of recommendations made by the National Commission on Terrorists Attacks upon the U.S. (the 9/11 Commission) in an effort to establish a framework in which information sharing within the IC and across the law enforcement community will be significantly improved.³² The 9/11 Commission acknowledged that new challenges demand new approaches. Its objective in laying out a plan to improve information sharing is in response to the new threat faced by the nation, and to prevent another major intelligence failure like the one that lead to the events of September 11, 2001.³³ As identified in the 9/11 Commission report, a major breakdown in information sharing was a key factor that contributed to the failure to prevent the September 11, 2001 attacks.³⁴ In response to the 9/11 Commission’s recommendations, Congress passed and the President signed the Intelligence Reform Terrorism Prevention Act (IRTPA) of 2004.³⁵ Section 1016 of the law called for the creation of an ISE, which was designed to facilitate the sharing of terrorism information across the intelligence and law enforcement communities.³⁶ To implement the new law, President Bush designated a program manager for the ISE and

³² George W. Bush. (2004). Executive Order Strengthening the Sharing of Terrorism Information to Protect Americans. Washington, DC: The White House.

³³Final Report of the National Commission on Terrorist Attacks Upon the United States, Norton: 2002

³⁴ Ibid.

³⁵ George W. Bush. (2004). Executive Order Strengthening the Sharing of Terrorism Information to Protect Americans. Washington, DC: The White House.

³⁶ Ibid.

established an information sharing council. The council advises the President and the program manager of ongoing information sharing initiatives, requirements and status updates.³⁷

In creating the ISE, the 9/11 Commission's intention was not to add to the existing layers of bureaucracy in the intelligence community; rather it sought to align and leverage existing information sharing policies, business processes, technologies, and systems to promote a culture of information sharing and collaboration.³⁸ The ISE's established primary mission is to break down the barriers to information sharing, build an architecture of integration, and transform the way intelligence is developed and disseminated.³⁹

On October 31, 2007, President Bush issued the first National Strategy for Information Sharing ("Strategy"), which laid out a plan to prioritize and unify the United States's efforts to advance the sharing of terrorism-related information. The Strategy integrates ISE-related initiatives and provides a framework that is envisioned to significantly improve information sharing since the September 11 attacks.⁴⁰ To meet the objectives stated in the Strategy, the ODNI has launched several initiatives to initiate cross-organizational collaboration along critical mission areas. More specifically, in its 500 day plan, the ODNI laid out six integration areas in which it aims to:⁴¹

1. Create a culture of collaboration,
2. Foster collection and analytic transformation,
3. Build acquisition excellence and technology leadership,
4. Modernize business practices,

³⁷ George W. Bush. (2004). Executive Order Strengthening the Sharing of Terrorism Information to Protect Americans. Washington, DC: The White House.

³⁸ Ibid.

³⁹ Information Sharing Environment Web site. Retrieved October 1, 2008 from <http://www.ise.gov/pages/vision.html>.

⁴⁰ Office of the Director of National Intelligence. (2007). *500 Day Plan*. Retrieved March 1, 2008 from <http://www.odni.gov/500-day-plan/500-day-plan.pdf>.

⁴¹ Ibid.

5. Accelerate information sharing, and
6. Clarify and align ODNI's authorities.

This thesis focuses on the ODNI's implementation of web 2.0 technology in pursuit of the six integration goals mentioned above. Specifically, it examines and evaluates the ODNI's use of wikis, blogs and other web 2.0 tools to improve on these six goals, as well as considers the impact of the ODNI's new web based information-sharing system.

C. INTELLIPEDIA

The IC's foray into the use of web 2.0 technology stemmed from a vision a CIA employee, Calvin Andrus, had regarding the utility of information sharing through wikis and blogs. Mr. Andrus put his vision in writing and won a CIA competition called the Galileo Awards in which any employee at any intelligence agency could submit an essay describing a new idea to improve information sharing. Andrus argued that the real power of the Internet comes from the boom in self-publishing; that everyday people surging online to import their thoughts and views contributed to a community bank of wisdom.⁴²

Journalist, James Surowiecki also wrote about this consolidation of collective intelligence online and termed it "the wisdom of crowds."⁴³

Andrus found Wikipedia to be especially valuable because anyone can edit an entry or create a new page without seeking permission from Wikipedia's web master.⁴⁴ This ability to create and access information allowed individuals to quickly disseminate information to a limitless audience. Andrus believed that intelligence analysts could take

⁴² D. Calvin Andrus. (2005). The Wiki and the Blog: Toward a Complex Adaptive Intelligence Community. *Studies in Intelligence*, 49,(3).

⁴³ James Surowiecki. (2004). *The Wisdom of Crowds*. New York: Random House.

⁴⁴ D. Calvin Andrus. (2005). The Wiki and the Blog: Toward a Complex Adaptive Intelligence Community. *Studies in Intelligence*, 49,(3).

advantage of the ease with which information could be disseminated through the use of the wiki and the blog and managed to convince the Chief Information Officer at the CIA to launch a pilot program.⁴⁵

In the fall of 2005, the ODNI joined forces with the CIA to build a prototype of Intellipedia, a wiki that any individual with the proper clearances could access and upload content.⁴⁶ To get the wiki off the ground, the team developing Intellipedia seeded it with hundreds of articles from non-classified documents. The Intellipedia team sent out emails to analysts inviting them to contribute to the wiki, and then monitored the wiki's development. After two years, more than 3,600 members of the IC had contributed a total of 28,000 pages.⁴⁷ Various agencies involved in the project hired "gardeners"⁴⁸ to dedicate their time to the maintenance of wiki pages through writing and editing pages. As Intellipedia marked its second anniversary in 2008, it continues to grow rapidly. As of October 1, 2008, Intellipedia has grown to 47,590 registered users and reached a level of 375,640 pages created.⁴⁹ As a result, there are approximately 400,000 pages helping to tie information together.⁵⁰

An early example of the value Intellipedia adds to intelligence work, particularly in maintaining situational awareness, was exhibited in an incident that took place in November 2006. The incident involved a small two-seater plane flown by a New York Yankees pitcher crashing into a Manhattan building. Within 20 minutes of the incident, an analyst created a page that provided the details of the incident, which was edited 80 times in the next two hours by employees of the Transportation Security Agency (TSA)

⁴⁵ Intellipedia Marks a Second Anniversary. (2008, March 20). *CIA.gov* Retrieved March 20, 2008 from <https://www.cia.gov/news-information/featured-story-archive/intellipedia-marks-second-anniversary.html>.

⁴⁶ Clive Thompson. (2006, December 3) Open Source Spying. *The New York Times*. Retrieved on October 16, 2008 from <http://www.nytimes.com/2006/12/03/magazine/03intelligence.html>.

⁴⁷ Per data reported on the "Intellipedia" page on Intellipedia on October 1, 2008. Retrieved October 1, 2008 from <https://www.intelink.gov/>.

⁴⁸ "Gardeners" is a term used by the creators of Intellipedia to refer to the individuals responsible for maintaining wiki pages.

⁴⁹ Ibid.

⁵⁰ Intellipedia Marks a Second Anniversary. (2008, March 20). *CIA.gov* Retrieved March 20, 2008 from <https://www.cia.gov/news-information/featured-story-archive/intellipedia-marks-second-anniversary.html>.

and eight different intelligence agencies.⁵¹ The real-time edits, made as new information became available, allowed analysts to conclude relatively rapidly that the crash was not terror-related. This is an example of the increase in efficiency the IC will experience as analysts begin to use web 2.0 technology more widely. Analysts were able to draw a quick conclusion to this incident because personnel working in disparate locations and agencies were able to simultaneously access and contribute pertinent information to the same Intellipedia page as the incident unfolded.

Another example of successful use of Intellipedia is the creation by ODNI of a National Intelligence Estimate (NIE) on Nigeria. An NIE is an authoritative snapshot of what the IC believes to be the current situation of a particular state as a guide for foreign, military and homeland security policy; it is typically the result of collaboration among the sixteen intelligence agencies. Given Nigeria's complex political and security issues (ranging from a coming election to the presence of Islamic radicalism), the creation of a Nigeria page on Intellipedia harnessed the knowledge of a dozen analysts that specialize in that country within a short amount of time.⁵² By using Intellipedia to create the NIE, the ODNI believed it also could gain contributions of analysts who, although not classified as Nigeria specialists, have various forms of specialized knowledge about the country. For example, such analysts may have served a term as a Peace Corp volunteer in the country or may have traveled there recently and observed something of relevance. The creation of a page providing access to analysts who are not directly involved in the project but are able to view its progress allowed analysts to voluntarily contribute valuable insight and information from the convenience of their workspaces. This capability reduces the traditional organizational hurdles previously necessary to assemble this kind of intelligence product, which historically involved contacting, requesting and scheduling several meetings with each agency's Africa expert, a timely and onerous

⁵¹ Intellipedia Marks a Second Anniversary. (2008, March 20). *CIA.gov* Retrieved March 20, 2008 from <https://www.cia.gov/news-information/featured-story-archive/intellipedia-marks-second-anniversary.html>.

⁵² Clive Thompson. (2006, December 3) Open Source Spying. *The New York Times*.

process. This use of technology to produce a high level document with a target audience including the White House and Congress enabled analysts to maximize collaboration with minimal effort.

In a May 2008 briefing on Intellipedia at the Government CIO Summit, Chris Rasmussen, a social software manager and trainer to the IC, highlighted attribution as a factor distinguishing Intellipedia from Wikipedia. Intellipedia's use of attribution is a key factor to maintaining the tool's integrity. Each individual who creates an Intellipedia profile or wiki page, or edits or comments on existing pages, is identified with every entry made.⁵³ This plays a significant role in keeping Intellipedia vandalism-free, and contributes to the notion that Intellipedia is a decentralized community in which each individual contributor contributes to its sustainability. Attribution is important because it ensures that all information posted in Intellipedia is linked to an individual. This is a powerful motivating factor to ensure that individuals posting information will be held accountable, and as such will be very careful to post information that is accurate and verifiable. In addition, because information sharing will be tied to performance evaluations, individuals who post information will be subject to evaluation based on the contents of their posts.⁵⁴

On September 24, 2008 Office of Personnel Management issued a memo supporting the Information Sharing Environment's guidance to all agencies within the IC to include information sharing elements in employee performance.⁵⁵ While each agency has the latitude to evaluate information sharing differently, according to a human capital officer within DHS, the addition of an evaluation on an employees' sharing of terrorism related information will be a performance measure that is equally weighted as existing performance measures and will impact employees' annual salary increase and promotion potential.

⁵³ Chris Rasmussen. (n.d.) Audio briefing on 'The Intellipedians', the social software movement within the U.S. Intelligence Community. Retrieved August 1, 2008 from <http://www.fcw.com/specials/intellipedia/>.

⁵⁴ Office of Personnel Management. (2008, September 24). Memo For the Information Council. . Retrieved September 24, 2008 from http://www.ise.gov/docs/guidance/OPM_Memo_Acting_Dir_Michael_Hager.pdf.

⁵⁵ Ibid.

Security concerns are frequently expressed by individuals over the accessibility of information on Intellipedia; however, as evidenced by the examples set forth above, the benefits of the technology outweigh the risk because Web 2.0 technology appeals to the new generation of Intelligence analysts, about half of whom, it is estimated, have less than five years of intelligence experience.⁵⁶ Following the 9/11 terror attacks, the IC hired thousands of new intelligence analysts, the majority of whom are of a generation used to using web 2.0 technology and expecting to use it in the workplace. Implementing web 2.0 tools is thus necessary to attract and retain young talent, who are vital to the success of the community.

Intellipedia usage is not limited to intelligence analysts within the IC: other users (holding the appropriate clearances) range from engineers, law enforcement officers, knowledge managers, and human resources specialists. The diverse group of users accesses the wiki to quickly obtain information on a wide variety of topics, including information on countries, national security issues, and other matters of interest to the U.S. government. The diversity of users is important because it provides an opportunity to gain multiple perspectives on topics. The more individuals that use Intellipedia, the more valuable it becomes.

Intellipedia is available on three systems: the unclassified network, the secret network and the top secret network. The unclassified network is available to anyone with a government e-mail address or who is sponsored by a government agency to have access; no security clearance is required. The secret and top secret portals are available only to individuals with the appropriate clearances. They contain the same information as the unclassified version of Intellipedia, supplemented with additional classified information.⁵⁷

⁵⁶ Mark Mazzetti. (2007, March 2). New Caution Among U.S. Intelligence Analysts. *International Herald Tribune*. Retrieved June 1, 2008 on <http://www.ihl.com/articles/2007/03/02/asia/web-0301intel.php>.

⁵⁷ Program from the Analytic Transformation Conference, (2007 September 4-6). Retrieved February 8, 2008 from <http://analytic.insaonline.org/atprogram.pdf>.

Authenticated individuals use Intellipedia to aggregate information and knowledge by creating, editing, and discussing articles in an agency-neutral and topically-focused work space. In an interview with Intellipedia blogger Marvin Corea, Chris Rasmussen emphasized that one of the important but overlooked features of Intellipedia is the discussion tab in which individuals are able to converse about the article.⁵⁸ Ideas often emerge from these discussions that are far more in depth than the article itself. This is another advantage of using Intellipedia rather than finished reports as a source for information: the information on the discussion or “talk” page (which is an adjacent tab to the main article page) often contains insights, background information, and discussion that provide the article with context. Gaining access to these background discussions by analysts across agencies has the potential to lead to the development of rich, dense products with added value and actionable intelligence. Additionally, Intellipedia could be used as a tool to capture the institutional knowledge of employees departing the IC (through retirement, transition of administration, or otherwise) that would otherwise disappear with their departure. Of particular importance is the potential retention of information assembled by political appointees who leave agencies during changes of presidential administrations.⁵⁹

Intellipedia has played an important role in building social capital within the IC by improving morale, unleashing creativity and helping individuals across the IC and USG to feel more connected.⁶⁰ This is particularly important to the Homeland Security Community, where linkages and information sharing between the Department of Homeland Security, Intelligence Community and Law Enforcement agencies are severely lacking and often criticized by Homeland Security oversight committees in Congress and the Government Accountability Office.⁶¹ Since its creation in 2002, the Department of

⁵⁸ Interview with Chris Rasmussen. Retrieved September 1, 2008, from http://esenai.com/blog/intellipedia/people/chris_rasmussen/.

⁵⁹ Stephen Losey. (2008, May 11). The Race to Collect Knowledge. *The Federal Times*. Retrieved May 21, 2008 on <http://www.federaltimes.com/index.php?S=3521664>.

⁶⁰ Intellipedia Marks a Second Anniversary. (2008, March 20). *CIA.gov* Retrieved March 20, 2008 from <https://www.cia.gov/news-information/featured-story-archive/intellipedia-marks-second-anniversary.html>.

⁶¹ Government Accountability Office. (2008, October). Opportunities Exist to Enhance Collaboration at 24/7 Operation Centers Staffed by Multiple DHS Agencies. GAO-07-89.

Homeland Security has consistently ranked at the bottom of the list of government agencies for employee satisfaction.⁶² In a series of interviews with DHS employees in March 28, a general consensus emerged that by introducing, promoting and encouraging the use of social networking tools, DHS will eventually benefit from the boost in morale of its employees. Specifically, the morale boost for employees will result from the increased opportunity to network, build rapport, and contribute expertise to the body of existing knowledge.

The positive social aspects of Intellipedia are not, however, without obstacles. As will be explained in other chapters, several social-related challenges face the IC with regard to the adoption of Intellipedia, including the need for cultural change, obtaining critical mass of adopters, mitigating potential risks of adoption, and overcoming the policy barriers that might hinder adoption.

Finally, according to ODNI, the use of Intellipedia and other web 2.0 technology is filling in the gaps within the IC that have contributed to previous failures in connecting the dots of facially disparate information. It is leading to the building of virtual communities of analysts who can securely exchange ideas and expertise across organizational boundaries and harness cutting-edge technology to find, access, and share information.⁶³ As Dr. Tom Fingar, ODNI's Deputy Director of National Intelligence for Analysis stated very bluntly at the August 2007 ODNI Information Sharing Conference and Technology Exposition: "We don't have enough analytical brains to meet all the challenges. We have to rely on technology. We have to rely on collaboration, and that requires information sharing. It's not the nice to-do category; it's in the absolutely necessary to do."⁶⁴

⁶² Michael P. Jackson. (2007, January 30). Memorandum for all DHS Personnel; Federal Human Capital Survey Results. via e-mail.

⁶³ Program from the Analytic Transformation Conference, (2007 September 4-6). Retrieved February 8, 2008 from <http://analytic.insaonline.org/atprogram.pdf>.

⁶⁴ Michael Wertheimer. (2006, August). Speech given at the DNI's Information Sharing Conference & Technology Exposition. *Intelink and Beyond: Dare to Share*. Retrieved December 1, 2007, from http://www.dni.gov/speeches/20060821_2_speech.pdf.

D. ANALYTIC TRANSFORMATION PROGRAM

The Analytic Transformation (AT) is an ODNI initiative that encourages and facilitates the IC's continued investment in technology, culture and analytic standards. ODNI is working to enable all intelligence agencies to provide intelligence analysts a common working environment that enables teamwork, provides better access to more data, and provides the tools that enable the exploitation of that data. The AT initiative encourages analysts to expose their thinking publicly with other analysts in order to provide inducement for teamwork across organizations. To ensure successful implementation to these changes, the ODNI made the AT program its #2 priority in its "100 day plan."⁶⁵ It has seen success through the September 2008 official launching of A-Space, its social networking application. Previous to its launch, A-Space was in development and testing for over a year. After logging in to A-Space analysts will have access to shared and personal workspaces, wikis, blogs, widgets, RSS feeds and other web 2.0 tools.⁶⁶ To log in, analysts will need to prove their identity using public key infrastructure, and they must be listed by their agencies in the government-wide intelligence analyst directory. Much like as in Facebook, users must create a personal profile, and colleagues can see what others are working on and the A-Space workspaces they are using.

The AT offers five user-generated Web 2.0 tools other than its best known Intellipedia application that analysts use for collaboration, including:⁶⁷

1. A YouTube-like video-sharing application.
2. A photo-sharing application similar to Flickr.
3. A tool for bookmarking web pages that is similar to del.icio.us.

⁶⁵ Office of the Director of National Intelligence. (2007). *100 Day Plan*. Retrieved March 1, 2008 from http://www.dni.gov/100-day-plan/100_FOLLOW_UP_REPORT.pdf.

⁶⁶ Program from the Analytic Transformation Conference, (2007 September 4-6). Retrieved February 8, 2008 from <http://analytic.insaonline.org/atprogram.pdf>.

⁶⁷ Ibid.

4. Instant Messaging.
5. Blogging Software.

The real power of these applications comes from integration of all these tools, and they will reach their peak effectiveness as more individuals embrace a culture of integration and information sharing and adopt the technology.

IV. A CULTURE OF COLLABORATION

Since its conception in 1947, the IC has had to undergo numerous reorganizations and reforms in order to respond to ever-changing threats; the next step in the IC's evolution is the adoption of web 2.0 technology. Adoption of that technology is a necessary step to try and make positive changes before another catastrophic intelligence failure occurs. The successful adoption of web 2.0 technology in the IC will require the same establishment of trust, openness and collaboration as core values and competencies that marked the success in the use of web 2.0 technology outside of the IC.⁶⁸ Development of such core values and competencies within the IC will be a unique challenge as it must transform its culture from one that is prone to compartmentalization, resistance to change and openness to a culture and mindset that encourages and rewards openness, innovation and collaboration.⁶⁹

A key aspect to successful use of web 2.0 technology, and one that should be the lifeblood of good intelligence work, is interdependence. Specifically, and as stated in ODNI's National Information Sharing Strategy released in February 2008, all sixteen member agencies of the IC must function as one body through cooperation, information sharing, innovation, and personnel sharing.⁷⁰ Without such coordination, progress as a collective whole in gaining the entire picture is impossible. This chapter will explore why applying such interdependence to adoption of web 2.0 technology will benefit the IC, and examine how to accomplish it. As set forth in more detail below, the former is clear from the use of web 2.0 technologies in other contexts, and the latter will require a commitment of leadership to overcome a number of obstacles inherent in the IC.

⁶⁸ Jason Miller. (2008, March 3). Intelligence analysts establish trust in an online community of their own making. *FCW.com*. Retrieved on March 3, 2008 from http://www.fcw.com/print/22_5/features/151790-1.html.

⁶⁹ Ibid.

⁷⁰ Office of the Director of National Intelligence. (2008, February). United States Intelligence Community National Information Sharing Strategy. Retrieved July 1, 2008 from http://www.dni.gov/reports/IC_Information_Sharing_Strategy.pdf.

A. THE BENEFITS OF TRUST AND COLLABORATION

By observing the collaborative nature of social media, it is easy to immediately see the benefits of implementing web 2.0 technology into the fabric of the IC. As a conduit to mass collaboration, web 2.0 technology has enabled users to collaborate on extremely complex issues.

1. Examples

The benefits of collaboration have been on display in other contexts in even the most complex of cases, including the race to identify the virus that causes SARS, as documented in James Surowiecki's book on collaboration, "The Wisdom of Crowds."⁷¹ As Surowiecki noted, it took the committed collaboration of scientific labs around the world to identify the virus that causes SARS in April 2003. By collaborating effectively, different labs were able to work simultaneously on the same samples, thus multiplying their speed and effectiveness. Surowiecki highlighted this event because the global effort to uncover the genetic strain that causes SARS was a remarkable feat by any measure, and was accomplished as a result of the collaborative effort of scientists around the world.⁷² Web 2.0 technology provides a workspace that facilitates simultaneous work in multiple locations in a manner similar to the collaborative work of scientists in multiple labs that identified the SARS virus. Specifically, it provides the opportunity for individuals to present data and collaborate online. Individuals conducting research around the globe may use applications such as wikis, virtual worlds, and social networking sites, such as Facebook and Twitter, to share information, keep colleagues informed of results and compare findings. The wikis, blogs, and workspaces created within the IC are the intelligence analysts' version of the scientists' labs, where they will be able to sift through data, cull through information, and produce valuable results that may eventually lead to an important intelligence discovery.

⁷¹ James Surowiecki. (2004). *The Wisdom of Crowds*. New York: Random House.

⁷² *Ibid.*

There are numerous examples of the benefits of collaboration through the general use of the internet. The internet is a particularly powerful platform for the collection of data and collaboration of individuals for use in creating valuable repositories of information. For example, after Hurricane Katrina hit New Orleans in August 2005, the fate of hundreds of thousands of victims was unknown. As a result, families of those victims began posting notices in online forums, such as Craigslist and Yahoo, in hopes of connecting with loved ones. Recognizing a need to build a central repository where families can post and search postings, an ad hoc team of volunteers across the country came together to build a central repository of survivor information called Katrinalist.⁷³ The impromptu web site compiled survivor data gleaned from all over the Web into a searchable format that made it easy to identify and locate friends and family members. No government grants, Congressional mandates, or elaborate communications protocols drove this effort; rather a loose group of committed individuals used web 2.0 technology to help those in need.⁷⁴ This is another example of the value web 2.0 technologies bring to a difficult situation, in which individuals seeking to find and connect with loved ones, were otherwise unable to. Web 2.0 technologies served as a virtual workspace in which compiled data enabled members of families to reunite during and after a chaotic situation in which individuals, because of the hurricane, were displaced, and lacking in basic necessities, and possibly facing crisis.

2. Application to the IC: Linking “Weak Ties”

Intelligence analysis would realize many benefits similar to those in the examples set forth above if the IC could implement effective collaboration. For example, intelligence analysts would benefit greatly from utilizing social media in order to research the location of a person of interest. Such research typically requires teams of analysts to study raw intelligence to determine where within a certain region a person may be

⁷³ Heather Green. (2007, September). Katrinalist.net and the Peoplefinder Project. *Businessweek*. Accessed September 25, 2007 from http://www.businessweek.com/the_thread/blogspotting/archives/2005/09/katrinalistnet.html.

⁷⁴ Don Tapscott and Anthony Williams. (2006). *Wikinomics: How Mass Collaboration Changes Everything*. (pp, 185-188). New York: Portfolio.

located. By using web 2.0 technologies, such as A-Space and Intellipedia, teams of analysts with “weak ties” would be able to collaborate to share information that would help to identify and eliminate places where the individual is not located, effectively reducing inefficient use of time and resources by narrowing the search to potential locations.

Collaborative web 2.0 tools such as the IC’s Intellipedia and A-space enable such interaction by analysts who would otherwise not likely be able to interact. They do so by providing a platform on which individual contributors end up sharing information with others with whom they connect based on profiles utilized in the tools that contain information about the analysts’ interests, current research projects, and subject matter expertise. Individuals may launch discussions in A-Space, for example, in designated forums to which A-Space participants can subscribe, view and contribute. On Intellipedia, individuals are able to discuss Intellipedia articles on the “talk” pages, and thus have the opportunity to pose questions on the substance of the article, request clarification, or provide insight.

The opportunity for collaboration through these web 2.0 tools is sociologist Mark Granovetter’s answer to his theory that significant innovation problems remain even in the presence of strong ties among relevant parties (e.g., people interacting on a long-term, frequent and sustained basis).⁷⁵ In the “The Strength of Weak Ties, Granovetter posits that web 2.0 tools can yield more successful collaboration by focusing on bringing together “weak ties” among different people who interact only infrequently and casually. So, for example, Analyst A is perusing through the profiles of other analysts on A-Space, and views the profile of Analyst B who has a subject matter expertise for which Analyst A is searching, but never encountered. When Analyst A connects with Analyst B through A-Space, a new, “weak tie” is forged. While strong ties are valuable connections, newly formed, weak ties have the potential to yield more novel information than existing strong

⁷⁵ Mark Granovetter. (1983). The Strength of Weak Ties: A Network Theory Revisited. (pp. 201-233). *Sociological Theory*.

ties. Connecting such “weak ties” using web 2.0 technology links the perspectives of a more divergent group and provides new perspective and more of the necessary convergence and collaboration.⁷⁶

In other words, with their broad reach, web 2.0 tools such as A-Space and Intellipedia are ideal vehicles to forge weak ties among analysts who normally stay in their comfort zone when seeking information, thus using web 2.0 tools complements the traditional “team-building” and “cross-functional management” characteristics of strong ties.⁷⁷

3. Decentralization

One characteristic of effective collaboration is the flattening of an organization in which individuals across the organization have more autonomy, self sustainability and decision making power.⁷⁸ In some cases, a lack of hierarchical structure promotes the free flow of information and collaboration. Indeed, in some cases, success results from such collaboration without any particular central figure or individual primarily responsible for it.

This decentralization of information is a benefit in complex projects because it is impossible for a single person to know everything he needs to know.⁷⁹ Collaboration allows individuals to incorporate many different kinds of knowledge in an active way. Such collaboration is particularly appropriate for the IC, where complex challenges require multiple perspectives to adequately problem solve. Collaboration guarantees a diversity of perspectives involving multiple stakeholders and produces rich results that increase speed and effectiveness. Without effective collaboration, the ability of the IC to

⁷⁶ Mark Granovetter. (1983). The Strength of Weak Ties: A Network Theory Revisited. (pp. 201-233). *Sociological Theory*.

⁷⁷ Ibid.

⁷⁸ Rod Beckstrom and Ori Brafman. (2006). *The Starfish and the Spider*. (pp 128-129). New York: Penguin Group.

⁷⁹ Ibid.

harness the power of multiple perspectives would be impeded and there will be a continued failure to connect the dots, a condition that precluded the IC from stopping the 9/11 terrorist attacks.⁸⁰

An example of effective collaboration by an organization of individuals that is flat, rather than hierarchical, is the SARS project mentioned above because the success was based on the collaborative efforts of dozens of individuals working in labs spanning the globe; there was no individual person credited with – or responsible for – the success.⁸¹

4. Unique Challenges Facing the Decentralization within the IC

There are distinct cultural barriers to collaboration and information sharing within the IC that will need to be overcome for adoption and innovation to succeed. If the IC is to achieve what Calvin Andrus referred to as “self-organizing” through the use of wikis and blogs, it will require a shift in paradigm from one of a long-standing centralized, and formal “intelligence cycle” to a decentralized environment.⁸² In one interview, an intelligence analyst and former military officer posited that this will be particularly challenging for a certain population of the IC: those who serve or served in the military and are accustomed to operating in a hierarchical, top-down environment. Such individuals may feel particularly uncomfortable seeking information from individuals outside their normal chain of command. In a culture that is particularly rank-conscious, new rules of online engagement will need to be created and followed. Additionally, the IC’s history of secrecy and a “need to know” culture pose a significant challenge.⁸³ Convincing individuals once socialized to remain guarded and tight-lipped, even within one’s own agency, to collaborate across agencies with people they do not know will be

⁸⁰ Office of the Director of National Intelligence. (2008, February). *United States Intelligence Community National Information Sharing Strategy*. Retrieved July 1, 2008 from http://www.dni.gov/reports/IC_Information_Sharing_Strategy.pdf.

⁸¹ James Surowiecki. (2004). *The Wisdom of Crowds*. (pp. 307-330). New York: Random House.

⁸² D. Calvin Andrus. (2005). The Wiki and the Blog: Toward a Complex Adaptive Intelligence Community. *Studies in Intelligence*, 49,(3).

⁸³ Clive Thompson. (2006, December 3) Open Source Spying. *The New York Times*. Retrieved on October 16, 2008 from <http://www.nytimes.com/2006/12/03/magazine/03intelligence.html>.

difficult at the outset. However, through training, encouragement and active participation of leadership, these hurdles may be reduced and ultimately overcome.

B. ACHIEVING TRUST AND COLLABORATION

There are three primary ways of achieving trust and collaboration: making trust a norm, reaching the social media's tipping point, and providing effective leadership. The IC will need to place a special emphasis on these three points in order to overcome the institutional bias of the IC and achieve the necessary trust and collaboration.

1. Making Trust a Norm

Trust within a community plays a significant role in an agency's success because individuals and organizations are most likely to share and work with organizations they trust.⁸⁴ In the context of this thesis, trust is defined as a true reliance on the integrity, strength, ability and surety of a person or thing; confidence.⁸⁵ As such, trust plays a crucial role in the successful adoption of social media technology.

Building trust in online communities is a significant challenge, as evidenced by early struggles with Wikipedia and Intellipedia. A primary obstacle to obtaining such trust is a lack of confidence in the integrity of the process, which allows users to freely enter information into the wiki. The free movement of information, however, also provides the oversight to ensure accuracy. Through mostly volunteerism, self-appointed auditors maintain and edit Wikipedia and Intellipedia, sometimes within minutes of entry.⁸⁶ A significant amount of trust has been established between Wikipedia and Intellipedia and their users to enable users to freely create wiki pages and contribute to the growing collection of knowledge.⁸⁷ Stephen R. Covey argues in "The Speed of Trust"

⁸⁴ Stephen M.R. Covey. (2006). *The Speed of Trust*. (p13). New York: Free Press.

⁸⁵ Trust. (n.d.). Dictionary.com Unabridged (v 1.1). Retrieved November 17, 2008, from Dictionary.com website: <http://dictionary.reference.com/browse/trust>.

⁸⁶ Jim Giles. (2007, September, 20). Wikipedia 2.0, Now With Added Trust. *New Scientist Tech Magazine*. Retrieved August 1, 2008 from <http://technology.newscientist.com/article/mg19526226.200-wikipedia-20-a-now-with-added-trust.html>.

⁸⁷ Ibid.

that trust has become the key leadership competency in the new global economy. As trust increases in an organization, productivity increases dramatically. By contrast, distrust impedes progress and negatively impacts execution. When trust is high, the dividend you receive is a performance multiplier: it elevates and improves every dimension of your organization. High trust significantly improves communication, collaboration, execution, innovation, strategy, engagement, partnering and relationships with all stakeholders. Establishing trust with one will lead to the establishment of trust with the many.⁸⁸

Ultimately, the way to achieve the needed trust is to ensure that it is encapsulated by the norms and conventions of an organization.⁸⁹ In general, norms and conventions tend to be deeply embedded in an organization's culture. Norms and conventions make life easier by reducing the amount of cognitive work an individual has to put in to accomplish a task. Conventions allow groups of disparate, unconnected people to organize themselves with relative ease and absence of conflict. For example, conventions such as driving on the right side of the road maintain order in an otherwise chaotic world. By internalizing such norms and conventions, activities become second nature.⁹⁰ To successfully implement the use of web 2.0 technology in the IC, practitioners will need to adopt the technology, and develop trust in the technology to the point it becomes a heavily relied upon tool. Ultimately an analyst's increase in trust in the technology will lead to it becoming a normative part of his or her research methods and online activities.

Convincing intelligence analysts to use these tools will require the development of trust, a challenge for a community that has remained closed and guarded, placing suspicion and protection above trust since its inception. The openness of Intellipedia and A-Space raises concern for users regarding security and accuracy, as it goes against the very norms and mores upon which the cultural foundation the IC was established.⁹¹ The

⁸⁸ Stephen M.R. Covey. (2006) *The Speed of Trust* (p13). New York: Free Press.

⁸⁹ Ibid.

⁹⁰ Ibid.

⁹¹ Jason Miller. (2007, September 6). CIA Works to Break Info-Sharing Barriers. FCW.com. Retrieved on September 1, 2008 from <http://www.fcw.com/online/news/103692-1.html>.

general culture embodies a fear of vulnerability; that the more people trust, the more vulnerable they are to exploitation. Since the creation of the Information Sharing Environment, efforts have been made to change that culture to one that is open to trusting one's peers in the IC enough to share information. One way to instill this kind of trust is to ingrain it in the culture of the IC so that it becomes an accepted norm.

The efforts of IC leadership will be paramount to establishing such trust, particularly by demonstrating its commitment to use of these tools. IC leaders should begin by encouraging their subordinates to collaborate on projects by creating an Intellipedia page. One way a leader might accomplish this is to create a wiki page for a particular project and, instead of sending emails, post all relevant information and documents in the wiki.⁹² By directing one's employees to the wiki as the sole source of information, leadership will force its subordinates to use these tools and benefit from their utility. As employees have positive experiences using these tools, the more likely they will be to continue to use them. The establishment of norms, rules and protocols by which individuals use these tools will create a sense of stability that will also engender trust within the organization.

2. Reaching the Social Media's Tipping Point

The key to getting people to change their behavior lies with the smallest details of their situation. If the intelligence analysts experience immediate benefit to adopting web 2.0 technology, chances are that a message regarding web 2.0's value will spread. Malcolm Gladwell argues in *The Tipping Point* that the spread of any new and contagious ideology has much to do with the skillful use of group power.⁹³ There needs to be a critical mass of people that endorse the technology. Such a mass endorsement can occur only if there is a community where new beliefs and practices can be expressed and

⁹² Chris Rasmussen. (n.d.) Audio briefing on 'The Intellipedians', the social software movement within the U.S. Intelligence Community. Retrieved August 1, 2008 from <http://www.fcw.com/specials/intellipedia/>.

⁹³ Malcolm Gladwell. (2002). *The Tipping Point: How Little Things Make a Big Difference*. (pp 89-93). New York: Little Brown Company.

nurtured. Once such a community exists, a message with an element of contagiousness by which individuals wish to learn more about it can help foment mass adoption.

Facebook is an example of this phenomenon. Facebook's popularity rose via word-of mouth-and can be traced to conversations regarding connections made via Facebook; such conversations draw others to create Facebook accounts to reap the social benefits they have overheard. Little causes, such as information gleaned from connecting with a relative or former high school classmate, can have large effects, and often times change happens not gradually but at one dramatic moment. This moment is described by Malcolm Gladwell as the "tipping point."⁹⁴

Gladwell defines the tipping point as "the moment of critical mass, the threshold, the boiling point." He contends that ideas, products, messages and behaviors spread like viruses.⁹⁵ In order for the IC to reach a critical mass of users of Intellipedia and A-Space, it must reach such a tipping point, which will arise when individuals view using these tools as a necessity. Specifically, this point will be reached when individuals within the IC believe that use of the tools is necessary to accomplish their work tasks, and the failure to use such tools will prompt serious risks of poor performance and criticism from peers or leadership.

To create that view in the IC, it needs to have the proper leadership (as detailed in the next section addressing effective leadership) to champion its implementation into daily usage. Access to training programs must be made available across the IC. Using these tools must be viewed as a widely accepted practice, a priority and necessity for success. As such, innovative thinking, behaviors and active information sharing should be tied to employees' performance appraisals as an incentive. When leadership takes the initiative to use these tools, employees will follow suit. Once the tipping point is reached, use of these tools will become as common place and expected in the work place as fax machines, word processing and e-mail.

⁹⁴ Malcolm Gladwell. (2002). *The Tipping Point: How Little Things Make a Big Difference*. (pp 89-93). New York: Little Brown Company.

⁹⁵ Ibid.

3. Providing Effective Leadership

Effective leadership will be necessary for collaboration to reach a tipping point within the IC; that leadership must demonstrate a positive attitude, as well as show respect and value of collaboration and information sharing. As such, IC management will need to actively encourage employees to perceive the changing world and adapt their area of responsibility to those new conditions by proactively using Intellipedia and A-Space. Leadership figures should lead the way by proactively establishing Intellipedia and A-Space accounts on their own, posting information, writing blogs, conducting research and incorporating those activities into daily routines. In doing so, leadership will instill trust within the organization, and display for the entire community that employing social media is a large part of daily work and is required to succeed.

Successful collaboration may even require having at least one “monomaniac” leader with a vision who is single mindedly focused on creating an effective collaborative effort and spreading the message. Such leaders provide the consistency of purpose needed for collaborative work and long-term collaborative success. Leadership committed to the long haul makes it easier to enforce collaborative norms, manage external stakeholder expectations, and deal with shifts and changes in key actors.

In a study on collaborative competencies within public administration, Heather Getha-Taylor theorizes that the major key to collaborative effectiveness within a public organization is staffing an organization with individuals who possess relationship-building competencies and have strong interpersonal understanding skills.⁹⁶ Leaders should search for those competencies in future applicants to the IC and across the federal government in order to build a community of individuals who have ability to work in teams, cooperate and collaborate.⁹⁷

⁹⁶ Getha Taylor. (2008). Identifying Collaborative Competencies. Review of Public Personnel Administration 2008; 28; 103.

⁹⁷ Ibid.

C. CONCLUSION

In conclusion, creating a culture of innovation and collaboration will be a unique challenge for the IC, which begins with an institutional bias against many of the key tenets of innovation and collaboration. It is a challenge, however, that must be undertaken as the IC should be able to duplicate the successes of web 2.0 technology in other contexts, and fulfill Congress's mandate of improved information sharing to avoid catastrophic terrorist attacks. The benefits of trust and collaboration will only be realized if the IC is able to make trust a norm, reach the social media's tipping point, and provide effective leadership. Leadership must champion the change in culture and demonstrate their commitment to using collaborative ways of working across the IC. For a collaborative effort to be successful in the long run, it will need a governance structure appropriate to the context, purpose, and membership of the collaborative effort. Leaders must reward employees who demonstrate commitment to collaboration, and ensure that employees have the tools they need to engage in social media.

V. DIFFUSION OF INNOVATION WITHIN THE IC

In addition to addressing the cultural challenges associated with adoption of web 2.0 technologies within the IC, the ODNI also must strategically diffuse the new technologies throughout the sixteen Intelligence agencies within the IC; such diffusion is necessary to obtain a “critical mass” of adopters. Diffusion refers to the process in which an innovation is communicated among members of a community through information channels over a period of time.⁹⁸ Diffusion of web 2.0 technology in the IC will require significant outreach to members to educate them of the value of these tools.

Currently, ODNI is communicating its message regarding the value of this technology through a series of conferences and meetings that tout the suite of web 2.0 technology tools developed for the IC. It also offers training classes, but these outreach efforts have not done enough to promote the tools. A crucial step necessary for a successful outreach program is to identify what will motivate members of the IC to use web 2.0 technologies. In his ground breaking book “Diffusion of Innovations” (1995), Rogers found that implementation of a new technology requires overt behavior change.⁹⁹ As a result, Rogers posits that the potential for implementation problems tends to be more serious when the adopter is an organization rather than an individual. This is due to the organizational hierarchy: often the individuals involved in the innovation-decision process in such a hierarchy are not the implementers.¹⁰⁰ Additionally, the organizational structure that gives stability and continuity to an organization may resist the implementation of an innovation. As such, the implementation stage for an organization may continue for a lengthy period of time, depending on the nature of the innovation.

The IC embodies the type of organization destined for the implementation struggles noted by Rogers; indeed, those struggles are magnified by the disparate nature of the IC, which is comprised of a relatively large number of agencies. The leaders of the

⁹⁸ Everett M. Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp168-218). New York, NY: Free Press.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

IC are heavily involved in the procurement process and instituting technology, but lower level analysts are the individuals who actually make day-to-day implementation decisions. Thus, the rate of web 2.0 adoption will be impacted directly by whether the analysts choose to use the technology, as well as how they choose to (and to what degree they) use it. Of course, such diffusion challenges are compounded by the culture and institutionalized structure of the IC that, as discussed in the previous chapter, provide resistance to adoption of a technology that undermines such a culture and structure.

Notwithstanding the challenges, if done correctly, an organization such as the IC can reach a point at which the new idea or technology becomes institutionalized as a regular component of an adopter's ongoing operations. Once the innovation loses its distinctive quality as the separate identity of the new idea, the innovation can be successfully socialized within the fabric of the organization.¹⁰¹ As applied to the IC, that point has yet to be reached. According to members of the IC interviewed in June 2008, web 2.0 technology has not been wholly accepted into the fabric of the community, as only two of the sixteen intelligence agencies are actively using it.¹⁰² The IC as a whole has not yet institutionalized using these tools; rather, individual analysts are still deciding whether to adopt them. Those individual analysts are trying out the new technology on a probationary basis to determine its usefulness to their own situations. Such small-scale trials are an important part of the decision-making process.¹⁰³ Rogers found that most individuals who try an innovation will then move to an adoption decision if the innovation proves to have at least a certain degree of relative advantage over existing methods.¹⁰⁴

¹⁰¹ Everett M. Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp168-218). New York, NY: Free Press.

¹⁰² This information was provided in an anonymous interview with a member of the IC.

¹⁰³ Everett M. Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp168-218). New York, NY: Free Press.

¹⁰⁴ Ibid.

A. STAGES

Rogers theorizes that there are five primary stages in the innovation-decision process that lead an individual to an overt behavior change.¹⁰⁵

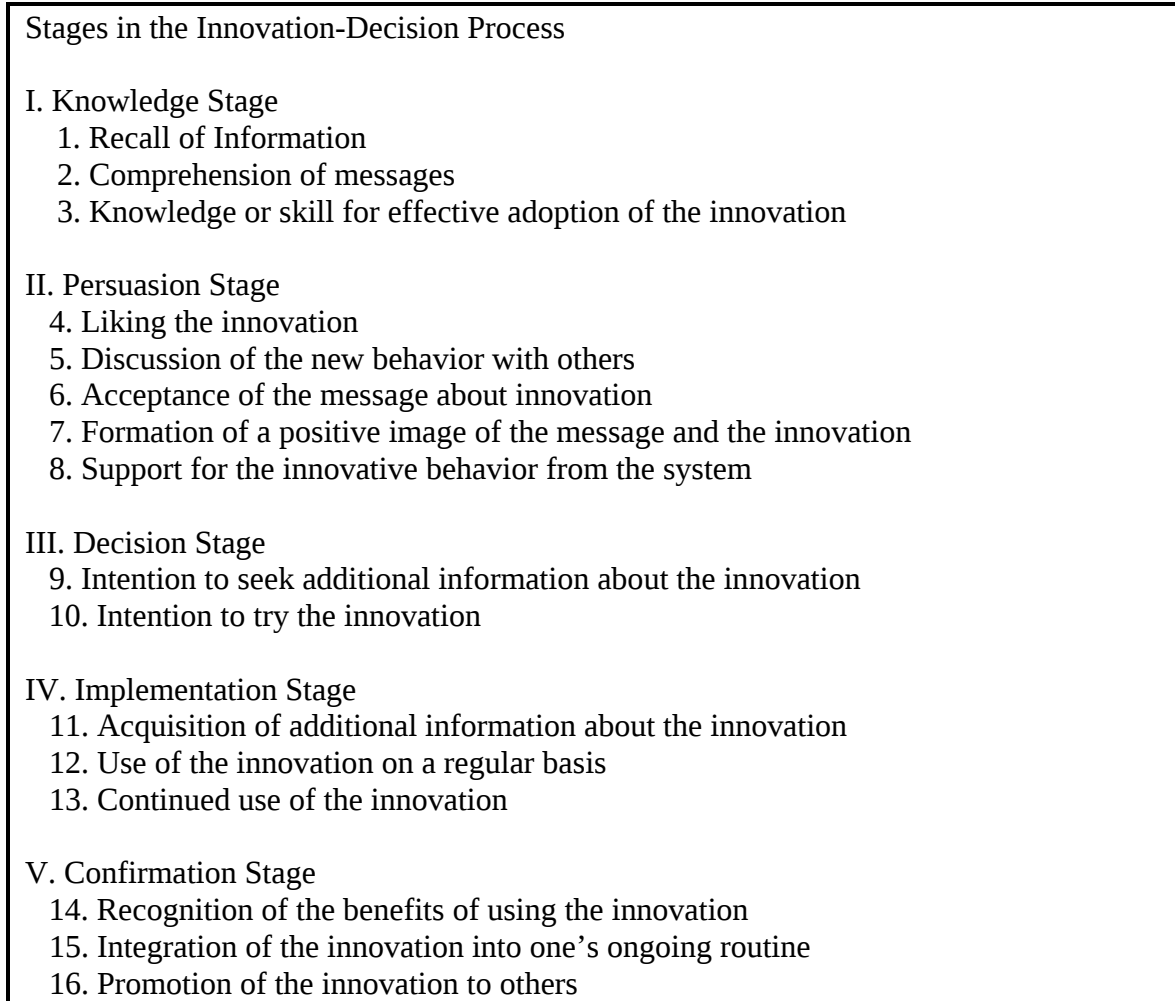


Figure 1. Innovation-Decision Process Stages

Because of the importance of the individual analyst to the decision-making process in the IC, it is helpful to view how such analysts can progress through such stages for a successful adoption of web 2.0 technologies.

¹⁰⁵ Everett M. Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp168-218). New York, NY: Free Press.

1. Knowledge Stage

In order for members of the IC to reach the knowledge stage, ODNI must make significant outreach efforts to educate the community about the value of the technology. As conveyed to me in an interview with an intelligence analyst, that has yet to happen. For example, the interviewee had no knowledge of the existence of Intellipedia until he stumbled upon it while doing a search using Intelink.¹⁰⁶ This intelligence analyst stated that no one is outwardly promoting these tools in the IC; in his view, information about web 2.0 or A-Space is spreading only through word of mouth, and at a very slow pace. Thus, it appears that adoption of web 2.0 technology has not even reached the first of the five Rogers stages. As Malcolm Gladwell discussed in his book, *The Tipping Point* (2006), a message gains power when it becomes “viral,” and then sticks and it spreads.¹⁰⁷ ODNI needs to launch a campaign to educate the entire IC on the existence of – and how to use – these tools.

2. Persuasion Stage

Once ODNI is able to increase knowledge of the technology within the IC, it needs to move into the persuasion stage. ODNI’s campaign should include carefully crafted messages that pique interest, and persuade analysts to not only learn more about web 2.0 technology but to actually try them. In focus group discussions held with groups of intelligence analysts, respondents indicated that tying use of web 2.0 technology to job performance ratings would be the ultimate form of persuasion and motivation. ODNI appears to be attempting to use job performance ratings in that fashion, as it released a memo on October 6, 2008 directing agencies responsible for handling intelligence and terrorism-related information to include competencies in

¹⁰⁶ Intelink is the Intelligence Community’s search engine and also provides a platform for blogging.

¹⁰⁷ Malcolm Gladwell. (2002). *The Tipping Point: How Little Things Make a Big Difference*. (pp 89-130). New York: Little Brown Company.

information sharing as a part of the annual performance appraisal process.¹⁰⁸ That is a good step in the persuasion process, and once acted upon, should have a strong impact.

3. Decision Stage

Interviews with analysts suggest that the first two stages are critical to IC implementation because once they reach the decision stage and try the technologies, they are impressed. Specifically, analysts mentioned that the more they use Intellipedia, the more they recognize its value. So, if the analysts can be convinced to try the technologies, they are likely to decide to use them.¹⁰⁹ That is particularly the case if the analysts recognize the potential opportunity for showcasing their expertise and recognition for work in a specialized area; such opportunities will make it worth the time of the analysts to decide to use the technologies.

4. Implementation and Confirmation Stages

It is a bit early to focus on the last two of Rogers's stages, but it appears that if the IC is able to successfully get through the knowledge, persuasion and decision stages, analysts are likely to take the final step of using the technologies on a regular basis by incorporating them into their routines.¹¹⁰ They also will be likely to promote the innovation to others, and thus push toward the "tipping point" described by Gladwell that will be crucial to ultimate adoption.¹¹¹ It may take time to reach the implementation phase in full force, but hopefully once critical mass is achieved, either through force (performance reviews, leadership mandate) or through independent adoption, the use of the technology will skyrocket to levels similar to that of Facebook, Myspace and other public facing web 2.0 enterprises.

¹⁰⁸ Office of the Director of National Intelligence. (2008, October 6). New Policy Makes Information Sharing a Factor in Employee's Performance Reviews. Retrieved October 6, 2008 from http://www.dni.gov/press_releases/20081006_release.pdf.

¹⁰⁹ Everett M Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp168-218). New York, NY: Free Press.

¹¹⁰ Ibid.

¹¹¹ Malcolm Gladwell. (2002). *The Tipping Point: How Little Things Make a Big Difference*. (pp. 253-260). New York: Little Brown Company.

B. OVERCOMING RESISTANCE THROUGH LEADERSHIP

As was evident in my interviews, the full workloads faced by many analysts are a major deterrent to learning how to use social media. It takes more than just curiosity and innovative thinking to prompt busy intelligence analysts with little time to learn new applications to try them. As indicated above, it will take external motivations tied to performance evaluations, and recognition of one's expertise and contribution to the community to push IC analysts towards adoption.

It is useful to examine how such motivations have overcome resistance in other contexts. Two obvious examples are the adoption of the fax machine and cell phone. Individuals resistant to using these new technologies became users of the technology, not necessarily out of their own volition, but out of necessity to remain competitive in the work force. A critical concept in understanding the social nature of the diffusion process is the "critical mass", the point after which diffusion becomes self-sustaining.¹¹² The interactive quality of new communication technologies, such as the fax and cell phone, create interdependence among the adopters in a system. An interactive innovation is of little use to an individual unless other individuals with whom the adopter wishes to communicate also adopt. Thus, a critical mass of individuals must adopt an interactive communication technology before it has much utility for the average individual in the system. With each additional adopter, the utility of an interactive communication technology increases for all adopters.¹¹³ Unless a critical mass of adopters occurs at a relatively early stage in the diffusion process, the rate of adoption is relatively slow, but once critical mass is achieved, the rate of adoption accelerates.¹¹⁴

At the heart of the diffusion process within an organization is the experience of modeling and imitating colleagues' use of a new idea or technology.¹¹⁵ In deciding whether to adopt an innovation, individuals depend mainly on the communicated

¹¹² Everett M. Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp343-364). New York, NY: Free Press.

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

experience of others in the same position who have already adopted the new idea. These subjective evaluations of an innovation flow mainly through interpersonal networks.¹¹⁶ Therefore, it is important to understand the nature of such networks in order to understand the diffusion process. As mentioned before, a critical component to adoption of web 2.0 technology within the IC is leadership. Leadership at all levels must champion adoption. There needs to be a cohort of opinion leaders, who will lead in influencing the opinions of others. In Rogers's research, the diffusion curve is S-shaped because once opinion leaders adopt and begin telling others about an innovation, the number of adopters per unit of time takes off in an exponential curve.¹¹⁷ Interpersonal communications drive the diffusion process by creating a critical mass of adopters. Incentives increase the rate of adopters of an innovation. Adopter incentives increase relative advantage and diffuser incentives increase the observability with which an innovation is perceived. Further, an adopter incentive may act as a tipping point that crystallizes an individual's favorable attitude into overt behavior change, hence triggering the adoption of an innovation.¹¹⁸

In short, IC leadership must work hard at implementing web 2.0 technology, and it will be particularly challenging given the number of organizations that make up the IC. Leadership in each agency is particularly key to promoting awareness and providing incentives to adopt within their agency. Analysts will only take the tools seriously if they see it heavily utilized by leadership and their peers.

¹¹⁶ Everett M Rogers. (2003). *Diffusion of Innovations*, Fifth Edition. (pp343-364). New York, NY: Free Press.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

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VI. SUCCESSFUL ADOPTION MODELS

There are a number of successful models for the adoption of web 2.0 technologies, in both the public and private sectors. The IC can learn from these models in an attempting to duplicate their successes.

A. PUBLIC SECTOR

There are several good examples of effective adoption of web 2.0 technology by government departments and agencies. Of particularly noteworthy success has been the use of external facing web sites to connect these departments and agencies with the general public.¹¹⁹ Web 2.0 technologies buttress several outreach activities that were previously impossible. Rather than relying on the traditional media of newspapers, radio or television to receive the news, the Internet delivers information to individuals, and web 2.0 technologies allow such individuals to choose which items they want to receive.¹²⁰ In addition, expressing opinions no longer requires citizens to write letters; expressing opinions requires only a click on the internet, and speaking as a group can be done through a blog.¹²¹

1. CDC

The Centers for Disease Control and Prevention (CDC) is an example of a federal agency's successful implementation of web 2.0 technology as an outreach tool to connect with the agency's stakeholders: the public. The CDC is using social networking and blogs to disseminate public health information to a massive audience.¹²² For example, CDC extensively uses podcasting to provide public health messages; indeed, it currently offers 300 different podcasts on its web site. A user can search the podcast database and

¹¹⁹ Daniel W. Drezner and Henry Farrell. (2004). Web of Influence. Foreign Policy, Issue 148.

¹²⁰ Ibid.

¹²¹ Ibid.

¹²² Nedra Weinreich. (n.d.). The CDC's Second Life. November 1, 2008 Accessed October 1, 2008 from <http://www.social-marketing.com/blog/2006/11/cdcs-second-life.html>.

listen to podcasts on a variety of health related subjects. CDC also used web 2.0 technology to promote vaccinations for seasonal flu by creating and placing clickable images on the CDC web site that link to the CDC.gov flu page. CDC also created webinars and blogs written by CDC experts on its flu page, where individuals can gain valuable insight on how to prevent and treat the flu.¹²³

CDC's experiences exemplify the "viral" component of a web 2.0 application. For example, a blogger who attended the CDC webinar took screenshots of his favorite slides and posted them on Flickr.¹²⁴ As CDC noted, more than 80 people on Flickr viewed that series of slides as well. The CDC model exemplifies the viral spread of information through web 2.0 technology, and the efficiency provided by the technology as it requires less time to get messages to the public using the web as a platform.

The CDC also experimented successfully with virtual worlds. CDC created a virtual world for children ages eight to twelve called "Whyville", which is a site for children to learn about science and health.¹²⁵ The website consists of two-dimensional graphics that depict a small town where Whyvillians could go to the virtual town hall for a virtual vaccination for the "Why Flu". Once a child creates an identity, she or he can pick an avatar. The CDC, realizing that children were communicating with their grandparents, sent a message to children upon signing in to the site that not only urged the children to seek vaccination in Whyville but also provided information on how the children could invite their grandparents to be vaccinated in-world against the Why Flu. Slightly fewer than 20,000 children were virtually vaccinated in six weeks.¹²⁶ The goal in the launch of this web site was to inspire children to talk about flu vaccinations so they could act as intermediaries to convince parents and their grandparents to be vaccinated. The CDC has also taken a number of other progressive steps using web 2.0 technology

¹²³ Nedra Weinreich. (n.d.). The CDC's Second Life. November 1, 2008 Accessed October 1, 2008 from <http://www.social-marketing.com/blog/2006/11/cdcs-second-life.html>.

¹²⁴ Flickr is an image and video hosting website, web services suite, and online community platform. It was one of the earliest Web 2.0 applications. In addition to being a popular Web site for users to share personal photographs, the service is widely used by bloggers as a photo repository.

¹²⁵ Nedra Weinreich. (n.d.). The CDC's Second Life. November 1, 2008 Accessed October 1, 2008 from <http://www.social-marketing.com/blog/2006/11/cdcs-second-life.html>.

¹²⁶ Ibid.

including: creating widgets¹²⁷ to promote vaccinations and providing a link to RSS that automatically updates with information feeds from the CDC.gov flu site and CDC's weekly incident reports (which features an interactive U.S. map).¹²⁸

The IC can benefit from creating virtual worlds similar to that of CDC's use of this technology both internally and externally. According to IC analysts, the IC has already begun to experiment with virtual worlds using them as simulations of terrorist attacks and other simulated events. Simulated virtual worlds such as the CDC's "Whyville" could be leveraged as an outreach tool to the general public to create an open source platform in which the public could be educated on identifying suspicious behavior in community settings, as well as educated on the functions and responsibilities of the various Federal law enforcement agencies that work in concert with the IC.

2. TSA

The Transportation Security Agency (TSA) is a leader in promoting goodwill by conducting outreach to the general public through its blog called "Evolution of Security."¹²⁹ The stated goal on its web site is to facilitate an ongoing dialogue on innovations in security, technology and the security checkpoint screening process.¹³⁰ The blog serves as an opportunity to approach the general public in a transparent, friendly format by providing information in journal-like entries. This information is particularly useful for members of the traveling public, whose only knowledge of TSA is from (in many cases, negative) interactions at security checkpoints at airports. As a TSA employee explained, TSA uses the blog in a myriad of strategic ways including: (i) defining TSA's mission; (ii) disseminating information on TSA's policies; (iii) dispelling security-related myths; and (iv) providing background information on policies pertaining to TSA's mandates on liquids and removing shoes at checkpoints. The blog features

¹²⁷ Widgets are applications that can be integrated within a third party website by the placement of a small snippet of code.

¹²⁸ Centers for Disease Control and Prevention Web site. (n.d.) Retrieved October 1, 2008 from <http://www.cdc.gov/HealthMarketing/ehm/virtual.html>.

¹²⁹ Transportation Security Agency. (n.d.) Evolution of Security Blog. Retrieved on September 1, 2008 on <http://www.tsa.gov/blog/>.

¹³⁰ Ibid.

entries by TSA personnel ranging from behavior detection officers who work in airports to administrators who work at TSA headquarters. The blog gives a human face to TSA and provides an opportunity for its readers to interact by leaving comments and asking questions. The public is also provided the ability to follow TSA bloggers on Twitter and to receive notifications on when the blog is updating.¹³¹

3. Hurricane Gustav

Another example of effective use of web 2.0 technology by the public sector to engage the general public is the use of blogs, twitter and social media during Hurricane Gustav. As the storm hit the gulf coast in August 2008, individuals affected directly by the storm used Twitter to provide information on traffic, links to breaking news stories, and relevant blogs.¹³² This ability to instantaneously post information to a platform created ways for individuals to maintain situational awareness, identify where people in their social network were located, identify traffic routes, and understand the extent of the damage of the storm. For example, private citizen Andy Carvin created a social network called the Gustav Information Center to aggregate Gustav-related content generated by the public, news organizations and government agencies.¹³³ The network also served as a place to coordinate volunteer activities and to identify projects that either required execution or were already in progress. The use of social media during Hurricane Gustav proved to be an excellent test case for how emergency responders would benefit from incorporating social media into their suite of tools because of the instant direct links it provides to information and people.¹³⁴ The ability to maintain situational awareness as

¹³¹Transportation Security Agency. (n.d.) Evolution of Security Blog. Retrieved on September 1, 2008 on <http://www.tsa.gov/blog/>.

¹³²Ki Mae Heussner. (2008, September 2). Social Media Proves Itself as Emergency Tool. Abcnews.go.com. Retrieved September 5, 2008 from <http://abcnews.go.com/Technology/SmartHome/story?id=5703281&page=1>.

¹³³ Andy Carvin. (2008, August). Getting Involved in Gustav Online Volunteer Efforts. Retrieved September 5, 2008 from http://www.andycarvin.com/archives/2008/08/getting_involved_in_gustav.html.

¹³⁴ Ki Mae Heussner. (2008, September 2). Social Media Proves Itself as Emergency Tool. Abcnews.go.com. Retrieved September 5, 2008 from <http://abcnews.go.com/Technology/SmartHome/story?id=5703281&page=1>.

exemplified by the use of Twitter during Hurricane Gustav is essential for the IC to carry out its mission, especially during a natural or man-made disaster.

B. PRIVATE SECTOR

Web 2.0 technology also has transformed the way users connect in the cyber world of the private sector, both in the personal domain and in the professional world.¹³⁵ Corporations already in the throes of technology-driven transformations such as globalization and outsourcing are employing web 2.0 technology to jump-start collaboration among various groups. This collaboration is occurring both internally between managers and employees, and externally between companies and clients, customers and potential employees. Large firms are increasing deployment of the technology in their suites of tools available to enable employees to communicate through wikis, social software applications and weblogs.

1. IBM

For example, IBM deployed web 2.0 technology in 2005 to enhance both internal business processes and communications external to the company, including those with clients and potential employees.¹³⁶ IBM recognized that web 2.0 technology had become a powerful tool, particularly given use of the blog as a leading source of information and entertainment for an increasing number of people. It also recognized the opportunities presented by blogs to collaborate and share ideas. Specifically, IBM began encouraging its employees to use blogs as a way to communicate with employees and customers.¹³⁷ The result is that now thousands of IBM employees use intranet-based blog tools to collaborate with colleagues in ways that were once locked inside e-mail boxes and mailing lists. In addition, senior management directed IBM sales marketers to work with

¹³⁵ Andrew P. McAfee. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. Sloan Management Review, 47(3).

¹³⁶ Stephen Baker. (2008, May 22). Big Blue Embraces Social Media Business Week. *Businessweek.com*. Retrieved May 30, 2008 from http://www.businessweek.com/magazine/content/08_22/b4086056643442.htm?chan=technology_technology+index+page_top+stories.

¹³⁷ Ibid.

customers through blogs as an efficient way to increase revenue.¹³⁸ As a result, many of these marketers now attribute their success to connections and working relationships that they established through the blogs.¹³⁹ The IBM experience exemplifies how blogging enables managers to engage with colleagues, employees and clients to the benefit of all.

In addition to blogging, IBM has created their own internal social networking tool called “The Beehive” that functions as a tool for IBM employees to discover employees with common interests or the appropriate skill set for a project.¹⁴⁰ IBM champions the concept that learning more about co-workers through social networking, either personally or professionally, facilitates making new connections and learning about ongoing projects and activities beyond their immediate team.¹⁴¹

IBM represents an excellent model for the IC because its organization is global in nature and the company faces a similar challenge in meeting the demand for increased collaboration across globally distributed organizations. IBM has tracked the use of its social media and found that the teams using tools with the most social capital are more productive and cohesive.¹⁴² IBM has found that its social media applications enable individuals to find the people and information they are seeking. The ability to look up personal profiles and learn about them is especially helpful for teams in which individuals are spread across the country or the world, and have never met.¹⁴³ The benefits IBM has gained in deploying Web 2.0 technology can be applied to the IC once individuals begin to use the tools. For example, in preparation for interagency IC

¹³⁸ Stephen Baker. (2008, May 22). Big Blue Embraces Social Media Business Week. *Businessweek.com*. Retrieved May 30, 2008 from http://www.businessweek.com/magazine/content/08_22/b4086056643442.htm?chan=technology_technology+index+page_top+stories.

¹³⁹ Ibid.

¹⁴⁰ IBM Web site. Retrieved September 1, 2008 from <http://www.research.ibm.com/social/news-20080917.html>.

¹⁴¹ Jeremiah Owyang. (2007, January 29). Interview Podcast with Ben Edwards on Social Media at IBM. Retrieved September 1, 2008 from <http://www.podtech.net/home/1994/ben-edwards-on-social-media-at-ibm>.

¹⁴² Robin Fray Carey. (n.d.). The Corporate Newsletter Goes Social: IBM and Employee Centered Social Media. Retrieved November 1, 2008 from <http://www.scribd.com/doc/2898918/Social-media-IBM-study>.

¹⁴³ Ibid.

meetings, participants can review each other's profiles, and glean information on the expertise, interests and hobbies of the others in advance of the meeting. Such familiarity with each other will not only make the meeting run more smoothly, it will enhance productivity by enabling participants to tailor questions to the other's stated expertise and interests, ask more specific questions, gain further clarity on a topic, and build rapport.

2. Amazon

Amazon.com exemplifies how utilizing web 2.0 technology is instrumental to an organization's survival and serves as a model for the IC because it allows customers to evaluate the feedback provided through the technology.¹⁴⁴ This feature adds enormous value to the web site because individuals searching for a particular product are not only provided information on the product through customer feedback; they also are provided information on whether other customers found the feedback useful.¹⁴⁵ The extra information allows an individual to educate him or herself as much as possible before performing a transaction or making a purchase, and to focus on the most useful feedback from others. Another Amazon feature that adds enormous value to the web site is in addition to the information it provides to consumers viewing a product, it provides information regarding what other individuals who viewed that product also viewed.¹⁴⁶ This feature is really valuable because it provides the individual with additional, maybe even better options.

The IC would benefit tremendously from features similar to those used by Amazon. If an analyst looking for information on a particular subject on Intellipedia is able to see what other analysts looking for the same information also viewed, it provides for a richer, more fruitful research experience because they can be led to other sources of valuable information. Additionally, analysts would benefit from the ability to rate

¹⁴⁴ Don Tapscott and Anthony. Williams. (2006). *Wikinomics: How Mass Collaboration Changes Everything*. (pp. 193-1999). New York: Portfolio.

¹⁴⁵ Ibid.

¹⁴⁶ Ibid.

Intellipedia pages, Intelink blogs or A-Space forums in terms of how helpful they are, in the same way users rate products on Amazon.com. That will allow subsequent users to focus on the most useful products.

In conclusion, the private sector has incorporated many web 2.0 best practices into their business processes resulting in increased profits, visibility to the public, improved reputation and value to the community. The IC will also reap these when technology adoption reaches critical mass.

VII. BEST PRACTICES AND CONCLUSION

Web 2.0 technologies can transform and improve interagency collaboration in the IC in many of the same ways that have marked their use through the internet in the public domain and private industry. The potential for success is illustrated in the early stages of ODNI's implementation of the Analytical Transformation program within the sixteen agencies across the IC. Intelligence analysts have already seen an impact in their ability to connect, share information, conduct research and analysis utilizing a suite of web 2.0 technology, including Intellipedia and A-Space.

Yet adoption of the technology in the IC will not be without challenges, including a number that are unique to IC. Cultural challenges to information sharing may deter the adoption of this technology and must be addressed through outreach, training and promotion of these tools. Leadership must play an integral role in incorporating these tools into the fabric of the community by making their use part of performance appraisals. In order to overcome these challenges and to emulate the successful use of web 2.0 technologies in other contexts, the following best practices should be adopted:

1. ***Encourage participation.*** Leadership within the IC must encourage their subordinates to: (i) create a profile on Intellipedia and A-Space; (ii) contribute and create Intellipedia entries and (iii) create blogs. One way to provide such encouragement is to lead by example. If leadership actively uses the suite of tools available through the AT, their subordinates are likely to do the same.
2. ***Initiate a cultural shift from “need to know” to “responsibility to provide”.*** To initiate such a shift, IC leadership must communicate to their subordinates the importance of moving from a culture of secrecy to one of information sharing. One way to prompt this effort is to create metrics to measure information sharing on employees' annual performance appraisals.
3. ***Manage the community.*** Intellipedia and A-Space administrators must manage online activity through monitoring and auditing blogs, and wiki entries, and providing abundant training, education, as well as question and answer opportunities to IC members.
4. ***Set standards of acceptable content.*** IC leadership and the administrators of the web 2.0 technology suite of tools must: (i) establish an agreed-upon

set of standards of acceptable content; (ii) provide that information to all users and (iii) monitor online activity to ensure the guidelines are met.

5. ***Encourage work in wikis rather than e-mail.*** Leadership must encourage the migration from email-based correspondence to wiki-centered collaboration. A way to do this is to create workspaces on A-Space dedicated to projects and encourage team members to work in the online space, rather than send drafts of documents for review.
6. ***Increase outreach program; provide demonstration.*** The IC must develop an outreach strategy to educate the 16 agencies within the IC about Intellipedia, A-Space and the suite of tools offered through the AT program. Trainers should visit each agency and provide demonstrations of applications and training courses.
7. ***Provide mandatory training across the IC.*** To obtain critical mass, IC leadership must require that all employees be briefed on the utility of web 2.0 technology and trained to use the applications.

If these best practices can be implemented, and web 2.0 technologies are successfully adopted in the IC, it will reap significant benefits in the form of improved collaboration, real-time peer review, and rapid dissemination of information to the end-user. The implementation of a community-wide social network also will reduce duplication of effort by linking analysts from disparate agencies working on similar or overlapping projects. Creating a social network (A-Space) similar to Myspace to build on the massive database (Intellipedia) developed in a manner similar to Wikipedia is a positive step toward improved intelligence sharing and will revolutionize the way information is gathered, analyzed and disseminated within the IC.

LIST OF REFERENCES

- Andrus, D. Calvin. (2005). The Wiki and the Blog: Toward a Complex Adaptive Intelligence Community. *Studies in Intelligence*, 49, (3).
- Bain, Ben. (2008, May 30). Intellipedia's Next Act. *FCW.com* Retrieved June 1, 2008 from <http://www.fcw.com/online/news/152705-1.html>.
- Baker, Stephen. (2008, May 22). Big Blue Embraces Social Media Business Week. *Businessweek.com*. Retrieved May 30, 2008 from http://www.businessweek.com/magazine/content/08_22/b4086056643442.htm?chan=technology_technology+index+page_top+stories.
- Beckstrom, Rod and Brafman, Ori (2006). *The Starfish and the Spider*. New York: Penguin Group.
- Brewin, Bob (2007, January 26). *DISA launches second NCES collaboration tool procurement.* *FCW.COM*, Retrieved February 13, 2008 from <http://www.fcw.com/online/news/97485-1.html>.
- Bush, George W. (2004). *Executive Order Strengthening the Sharing of Terrorism Information to Protect Americans*. Washington, DC: The White House.
- Centers for Disease Control and Prevention Web site. (n.d.) Retrieved October 1, 2008 from <http://www.cdc.gov/HealthMarketing/ehm/virtual.html>.
- Carvin, Andy (2008, August). Getting Involved in Gustav Online Volunteer Efforts. Retrieved September 5, 2008 from http://www.andycarvin.com/archives/2008/08/getting_involved_in_gustav.html.
- Charman, Suw (2006). *An Adoption Strategy for Social Software in Enterprise*, Blog Posting. Retrieved December 1, 2007 from <http://strange.corante.com/category/adoption>.
- Covey, Stephen M.R. (2006). *The Speed of Trust*. New York: Free Press.
- Diaz, Sam (2007, August 27). Consumer Innovations to Inform Web Site for Spies. *Washingtonpost.com*. Retrieved February 1, 2007 from <http://www.washingtonpost.com/wp-dyn/content/article/2007/08/24/AR2007082401868.html>.
- Dizard, Wilson (2006, September 25). Spy agencies adapt social software, federated search tools, *Government Computer News*. Retrieved February 8, 2008 from http://www.gcn.com/print/25_29/42090-1.html.

- Dizard, Wilson (2006, September 25). Intel Leaders try to Think Alike on Sharing. *Government Computer News*. Retrieved February 8, 2008 from http://www.gcn.com/print/25_29/42088-1.html?page=1.
- Dorobek, Christopher J. (2008, July 22). FCW Insider: FCW-Federal News Radio show with Intellipedia's Chris Rasmussen. *FCW.com* Retrieved on July 23, 2008 from <http://www.fcw.com/blogs/editor/153195-1.html>.
- Downes, Larry and Chunka Mui (1998). *Unleashing the Killer App: Digital Strategies for Market Dominance*. Cambridge, MA: Harvard Business School Press.
- Drezner, Daniel W. and Henry Farrell (2004). Web of Influence. *Foreign Policy*, Issue 148.
- Economist Intelligence Unit. (2007). *Serious Business. Web 2.0 goes Corporate*.
- Eilenber, Dawen (2006, March/April). Intellipedia Shows Revolutionary Promise. *Pathfinder*, 5.
- Fray Carey, Robin. (n.d.). The Corporate Newsletter Goes Social: IBM and Employee Centered Social Media. Retrieved November 1, 2008 from <http://www.scribd.com/doc/2898918/Social-media-IBM-study>.
- Getha-Taylor. (2008). Identifying Collaborative Competencies. *Review of Public Personnel Administration* 20008; 28; 103.
- Gladwell, Malcolm (2002). *The Tipping Point: How Little Things Make a Big Difference*. New York: Little Brown Company.
- Giles, Jim. (2007, September, 20). Wikipedia 2.0, Now With Added Trust. *New Scientist Tech Magazine*. Retrieved August 1, 2008 from <http://technology.newscientist.com/article/mg19526226.200-wikipedia-20-â-now-with-added-trust.html>.
- Government Accountability Office. (2008, October). Opportunities Exist to Enhance Collaboration at 24/7 Operation Centers Staffed by Multiple DHS Agencies. GAO-07-89.
- Granovetter, Mark. (1983). The Strength of Weak Ties: A Network Theory Revisited. *Sociological Theory*.

- Green, Heather (2007, September). Katrinalist.net and the Peoplefinder Project. *Businessweek*. Accessed September 25, 2007 from http://www.businessweek.com/the_thread/blogspotting/archives/2005/09/katrinalistnet.html.
- Harris, Shane, Intelligence (2007, September 24). Veteran Aims to Motivate Young Analysts, National Journal. *Govexec.com*. Retrieved September 24, 2007 from http://www.govexec.com/story_page.cfm?articleid=38114.
- Havenstein, Heather (2007, February 23). Top Secret: DIA Embraces Web 2.0. *Computer World*. Retrieved on February 1, 2008 from <http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=9011671>.
- Heussner, Ki Mae (2008, September 2). Social Media Proves Itself as Emergency Tool. *Abcnews.go.com*. Retrieved September 5, 2008 from <http://abcnews.go.com/Technology/SmartHome/story?id=5703281&page=1>.
- IBM Web site. Retrieved September 1, 2008 from <http://www.research.ibm.com/social/news-20080917.html>.
- Information Sharing Environment Web site. Retrieved October 1, 2008 from <http://www.ise.gov/pages/vision.html>.
- Intellipedia Marks a Second Anniversary. (2008, March 20). *CIA.gov* Retrieved March 20, 2008 from <https://www.cia.gov/news-information/featured-story-archive/intellipedia-marks-second-anniversary.html>.
- Jackson, Michael P. (2007, January 30). *Memorandum for all DHS Personnel; Federal Human Capital Survey Results*. via e-mail.
- Lipowicz, Alice. (2008, October 16). Intellipedia said to be growing rapidly. *FCW.com*. Retrieved October 16, 2008 from <http://www.fcw.com/online/news/154094-1.html>.
- Losey, Stephen. (2008, May 11). The Race to Collect Knowledge. *The Federal Times*. Retrieved May 21, 2008 on <http://www.federaltimes.com/index.php?S=3521664>.
- Mazzetti, Mark. (2007, March 2). New Caution Among U.S. Intelligence Analysts. *International Herald Tribune*. Retrieved June 1, 2008 on <http://www.iht.com/articles/2007/03/02/asia/web-0301intel.php>.
- McAfee, Andrew P. (2006). Enterprise 2.0: The Dawn of Emergent Collaboration. *Sloan Management Review*, 47(3).

Memorandum for the Heads of Executive Departments and Agencies: Guidelines and Requirements In Support of the Information Sharing Environment (2005).

Miller, Jason (2007, September 6). CIA Works to Break Info-Sharing Barriers. *FCW.com*. Retrieved on September 1, 2008 from <http://www.fcw.com/online/news/103692-1.html>.

Miller, Jason. (2008, March 3). Intelligence analysts establish trust in an online community of their own making. *FCW.com*. Retrieved on March 3, 2008 from http://www.fcw.com/print/22_5/features/151790-1.html.

Mohamed, Arif (2008, February 27). Professionals Capitalise on Business Connections with LinkedIn. *Computer Weekly*. Retrieved on February 27, 2008 from <http://www.computerweekly.com/Articles/2008/02/12/229365/professionals-capitalise-on-business-connections-with.htm>.

MySpace generation. (2005, December 12). *Business Week*. Retrieved February 8, 2008 from http://www.businessweek.com/magazine/content/05_50/b3963001.htm.

National Commission on Terrorist Attacks Upon the United States (2004). *The 9/11 Commission Report*. Washington, D.C.: Government Printing Office.

Newman, Peter. (1998). *The New Palgrave's Dictionary of Economics and the Law*. Palgrave MacMillan: New York.

Office of Homeland Security. (2002). *National Strategy for Homeland Security*. Washington D.C.

Office of the Director of National Intelligence, *Analytical Transformation Implementation Plan*: 2007.

Office of the Director of National Intelligence. (2007). *100 Day Plan*. Retrieved March 1, 2008 from http://www.dni.gov/100-day-plan/100_FOLLOW_UP_REPORT.pdf.

Office of the Director of National Intelligence. (2007). *500 Day Plan*. Retrieved March 1, 2008 from <http://www.odni.gov/500-day-plan/500-day-plan.pdf>.

Office of the Director of National Intelligence. (2008, October 6). *New Policy Makes Information Sharing a Factor in Employee's Performance Reviews*. Retrieved October 6, 2008 from http://www.dni.gov/press_releases/20081006_release.pdf.

Office of the Director of National Intelligence. (2008, February). *United States Intelligence Community National Information Sharing Strategy*. Retrieved July 1, 2008 from http://www.dni.gov/reports/IC_Information_Sharing_Strategy.pdf.

- Olsen, Florence. (2007, December 17). Intell's wiki pied piper. *FCW.com*. Retrieved on August 1, 2007 from http://www.fcw.com/print/13_43/management/151075-1.html.
- O'Reilly, Tim. (2005, September 30). *What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*. Retrieved December 1, 2007 <http://www.oreilly.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>.
- Owyang, Jeremyiah. (2007, January 29). Interview Podcast with Ben Edwards on Social Media at IBM. Retrieved September 1, 2008 from <http://www.podtech.net/home/1994/ben-edwards-on-social-media-at-ibm>.
- Program from the Analytic Transformation Conference, (2007 September 4-6). Retrieved February 8, 2008 from <http://analytic.insaonline.org/atprogram.pdf>.
- Rogers, Everett M. (2003). *Diffusion of Innovations*, Fifth Edition. New York, NY: Free Press.
- Rasmussen, Chris. (n.d.) Audio briefing on 'The Intellipeditians', the social software movement within the U.S. Intelligence Community. Retrieved August 1, 2008 from <http://www.fcw.com/specials/intellipedia/>.
- Sternstein, Aliya. (2007, February 8). The Digital Big Bang. *FCW.com* Retrieved February 13, 2008 from http://www.fcw.com/print/13_1/news/97228-1.html.
- Surowiecki, James. (2004). *The Wisdom of Crowds*. New York: Random House.
- Tapscott, Don, and Williams, Anthony. (2006). *Wikinomics: How Mass Collaboration Changes Everything*. New York: Portfolio.
- Thompson, Clive (2006, December 3) Open Source Spying. *The New York Times*. Retrieved on October 16, 2008 from <http://www.nytimes.com/2006/12/03/magazine/03intelligence.html>.
- Transportation Security Agency. (n.d.) *Evolution of Security Blog*. Retrieved on September 1, 2008 on <http://www.tsa.gov/blog/>.
- Weinreich, Nedra. (n.d.). The CDC's Second Life. November 1, 2008. Accessed October 1, 2008 from <http://www.social-marketing.com/blog/2006/11/cdcs-second-life.html>.
- Wertheimer, Michael. (2006, August). Speech given at the DNI's Information Sharing Conference & Technology Exposition. *Intelink and Beyond: Dare to Share*. Retrieved December 1, 2007, from http://www.dni.gov/speeches/20060821_2_speech.pdf.

Wikipedia for Intel Officers Proves Useful. (2006, November). *National Defense Magazine*. Retrieved February 1, 2008 on <http://www.nationaldefensemagazine.org/issues/2006/November/SecurityBeat.htm#Wik>.

Whitney, Diana, Cooperrider, David. (2003). *The Power of Appreciative: A Practical Guide to Positive Change*. San Francisco: Berett-Koehler Publishers.

APPENDIX: OVERVIEW OF WEB 2.0 APPLICATIONS

Web 2.0	Description	Business Purpose	Advantage
Really Simple Syndication (RSS)	Brings information from numerous assorted websites into one place	Opportunity to garner widespread exposure of organization's most recent news and events to stakeholders who opt-in	- Minimal risk - Widespread exposure to interested parties - Decreases dependence on mass emails - Increases the effectiveness of content
Blog	User-generated website where entries are made in journal style and displayed in reverse chronological order	Engage stakeholders and form relationships between one person and the public. Create unfiltered, honest dialogue from a seemingly credible source	- Receive immediate feedback from stakeholders and interested parties - Ability to host a global conversation
Podcast	Audio file syndicated and published on the internet for use on computers and personal media devices	Mechanism to deliver speeches, interviews, social commentaries and lectures to educate the public on a vast array of topics	Enables organizations to disseminate streaming media to a web audience
Vodcast	Video delivered on demand through internet (podcast video)	Mechanism to deliver video and engage beyond text-only communications	Enables organizations to disseminate streaming media to a web audience
Mashup	Web application that combines data from more than one source into a single integrated tool	Method for aggregating data and web 2.0 technology in one location	Mashup technologies provide the ability to develop new integrated services quickly.
Message Boards/Forums	Venue for holding discussions and posting user generated content resulting in virtual communities	Engage stakeholder in dialogue. Find information about stakeholder demographics and needs	Facilitates and promotes ongoing conversation
Wikis	Collaboration tool that allows content to be edited by anyone	Facilitates collaboration among a few or a million. Aggregates all stakeholder wants, needs, concerns and ideas.	- Offers forum for engagement and opinion expression - Leads to greater consensus - Track progression of entries - Facilitates groupthink

Web 2.0	Description	Business Purpose	Advantage
Virtual Worlds	Computer based simulated environments intended for its users to inhabit and interact via electronic message	Offers unique marketing/communications awareness, training and stakeholder relationship opportunities	• Can be used by anyone anywhere • Unique form of interaction, engagement and marketing
Folksonomy	The practice and method of collaboratively creating and managing tags ¹⁴⁷ to annotate and categorize content	Offers a convenient way to aggregate information.	• Makes a body of information increasingly easy to search, discover, and navigate over time.
Social Bookmarking	Method for Internet users to store, organize, search, and manage bookmarks of web pages on the Internet with the help of metadata.	A social bookmarking system can rank a resource based on how many times it has been bookmarked by users, which may be a more useful metric for end users than systems that rank resources based on the number of external links pointing to it.	• Useful as a way to access a consolidated set of bookmarks from various computers, organize large numbers of bookmarks, and share bookmarks with contacts.
Social Networking	Online communities of people who share interests and activities or who are interested in exploring the interests and activities of others	Users generate original text, audio and/or video content and create value through people-to-people connections via web-based tools	• Create groups of common interest/affiliations • Expand contact base • Customer relationship management tool • Marketing opportunity • Emphasizes relationships
Twitter	Social networking and micro-blogging service that allows its users to send and read other users' updates (otherwise known as tweets), which are text-based posts of up to 140 characters in length	Provides a quick and convenient method to disseminate information	• Increases efficiency and speed of information dissemination

¹⁴⁷ “Tagging” is a Web 2.0 service that allows individuals to collectively classify and find information.

INITIAL DISTRIBUTION LIST

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