

# **14<sup>th</sup> ICCRTS: C2 and Agility**

## **“Adopting Emerging Technology to Enhance Organizational Performance”**

### **Primary Topic:**

### **Topic 3: Information Sharing and Collaboration Processes and Behaviors**

### Alternate Topics:

Topic 1: C2 Concepts, Theory, and Policy

Topic 7: C2 Approaches and Organization

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*Abstract for  
Adopting Emerging Technology to Enhance Organizational Performance*

Successfully incorporating Web 2.0 technologies into large organizations remains both a challenge and an opportunity. Ambivalence surrounding the utility of these tools pervades even as demand for them increases. Adopted by some high ranking Defense officials, such as DoN CIO and the Commander, U.S. Southern Command, as information dissemination mediums, these efforts focus primarily on external, strategic communications. Successfully integrating these tools as mediums for internal governance represents a key challenge. Knowledge management, specifically in enhancing corporate situational awareness, constitutes an important domain to successfully apply these tools.

This paper will address how, through the adoption of Web 2.0 technologies, a collaborative group of analysts at the Space and Naval Warfare Systems Center, Pacific has evolved its model for enhancing strategic situational awareness. As described by Alberts, et al., this change constitutes a shift from an industrial age to an information age model, where the inverse relationship between the “richness” of the information and its “reach” no longer holds, and where enhanced collaboration can flourish. Moreover, the *modus operandi* of senior leadership has shifted from one concerned with ensuring pertinent information trickled down to the workforce, to one that expects this knowledge embedded into ongoing planning and business development efforts.

*Keywords: web 2.0, weblog, information age, environmental scanning*

## Introduction

Collecting and monitoring information in a primarily unclassified realm, the Corporate Strategy Group provides the senior leadership and workforce at the Space and Naval Warfare Systems Center, Pacific with open-source, competitive intelligence to enhance their situational awareness and fulfill the external information needs of the organization.<sup>1</sup> Chartered by the Center's senior leadership in 2001, the CSG provides an assessment of the current external environment, including pertinent developments in defense policy, technological advances, and military matters impacting all the Services.<sup>2</sup> In addition, the CSG seeks to provide DoD scientists and engineers with the knowledge to address current and emerging warfighter gaps. Ultimately, this effort is one of getting the right information, to the right people at the right time, so that efforts at SSC Pacific align closely Navy and DoD initiatives and strategy guidance.

Beginning in late 2007, the Corporate Strategy Group (CSG) embraced Web 2.0 technologies in a bid to overcome gaps in the flow of information inherent in its traditional "push" model. A primary driver in this decision was a demand for a wider dissemination of this information across the organization. Since 2001, the CSG relied primarily upon top-level brief to senior leadership with that expectation that this information would eventually 'trickle down' to those in need of it. Despite some exceptions, most of this information did not make it down to those on the proverbial "edge," the scientists and engineers writing proposals that reap work for the Center. Since leveraging Web 2.0 technology, specifically weblogs and *wikis*, the CSG has dramatically improved the scope of its dissemination and has also enhanced its internal work processes.

Upon a brief overview of the SSC Pacific and the challenge of the how providing pertinent information in a large, complex organization, the paper will convey how the

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<sup>1</sup> The Space and Naval Warfare Systems Center, Pacific (SSC Pacific) was established in June 1940 as the Navy Radio and Sound Laboratory, the Navy's first west coast lab. For over six decades, and under numerous names and organizational structures, SSC Pacific has provided American warfighters with significant capabilities in the form of weapon systems and electronic technology. Presently its focus continues to be in the area of command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR). With a workforce of over 1,900 engineers and scientists, SSC Pacific provides full spectrum C4ISR capabilities from basic research and prototype development, to test and evaluation services, through systems engineering and integration, onto installation and life-cycle support. While most of its projects address the requirements of the Navy and Marine Corps, SSC Pacific also supports programs of the Defense Advanced Research Projects Agency, the other Services, as well as various other DoD and federal government agencies. SSC Pacific's overriding challenge continues to be providing the nation's warfighters with the resources to achieve decision superiority.

<sup>2</sup> The Current Strategy Group was until recently known as the Decision Support Group. While the name has changed, its duties and function remain very much the same. For a detailed overview of the Current Strategy Group and the environmental scanning process, please see Galdorisi, George et al, "Maintaining Situational Awareness in Large, Complex Organizations," *11th International Command and Control Research and Technology Symposium*, Newport, RI, September 26-28, 2006. See also a prior version of the paper, under the same title, as presented at the *2006 Command and Control Research and Technology Symposium*, San Diego, CA. June 20-22, 2006.

<[http://www.dodccrp.org/events/11th\\_ICCRTS/html/papers/044.pdf](http://www.dodccrp.org/events/11th_ICCRTS/html/papers/044.pdf)>

<[http://www.dodccrp.org/events/2006\\_CCRS/html/papers/071.pdf](http://www.dodccrp.org/events/2006_CCRS/html/papers/071.pdf)>

CSG fits within the overarching strategic framework, its value proposition, and the processes underpinning its efforts at enhancing situational awareness. Thereupon, it will relate how the CSG transformed its information dissemination model by adopting a “bottom up” approach combining “power to the edge” concepts with new technology, and how this has changed expectation by senior leadership since said model has been adopted.

### **The Imperative for Situational Awareness in Large Organizations**

Established as the Navy’s first West Coast Laboratory, SSC Pacific serves as a research, development, test, evaluation, engineering and fleet support center for command, control, communication systems, and ocean surveillance systems. With a \$1.7 billion annual budget, SSC Pacific employs more than 3,800 civilian scientists, engineers, and technicians involved in hundreds of C4ISR projects, developing technology to meet the future warfighter needs, while providing life-cycle support to keep current technology operable.

Although a government facility, SSC Pacific functions as a working capital fund, relying upon revenue generated by projects for the military services that it bids for and wins. No line item in the defense budget exists for SSC Pacific; it must find work to fund itself by competing against industry and other labs. Thus, while it does not make a profit, the Center in many ways operates like a private enterprise, with a prevalent entrepreneurial culture among its scientists, engineers and managers.

Given the competitive environment in which it operates and the imperative to remain competitive, strategic planning and the attendant need for situational awareness constitute necessities for the Center’s leadership and workforce. In addition, due to the broad spectrum of projects under its auspices, and its location away from the Washington D.C., the need for SSC Pacific’s leadership to remain abreast of current, and relevant, defense policy guidance, emerging technological needs, and other military developments.

To this end, and since its inception in 2001, the overriding responsibility of the CSG remains providing relevant information to SSC Pacific senior executives and the scientists and engineers who write the business proposals that ultimately result in the work that funds the organization. Beginning in 2007, the CSG adopted Web 2.0 technologies to complement its “traditional” methods of information sharing and bridge communication gaps. This new methodology now constitutes the primary medium to communicate information throughout the organization. Before elaborating on said methodology, a quick review of the CSG’s experience merits attention.

### **Corporate Strategy Group – An Overview**

To provide and enhance the situational awareness of its parent organization, the CSG has employed a competitive intelligence infrastructure and process centered around environmental scanning. Broadly defined, environmental scanning constitutes the internal communication of external information about issues, trends, and developments

that may influence the organizations decision making process.<sup>3</sup> Research and analysis efforts are organized under the following nine categories, with individual analysts assuming responsibility for leading efforts in each of the given categories, thus cultivating a degree of expertise in each of these areas.

<b>Category</b>	<b>Definition/Purpose of Category</b>
<b>Strategy</b>	High level strategy of the federal government & updates on the current geopolitical environment
<b>Transformation</b>	Structural changes within the Department of Defense addressing the Global War on Terror and other large policy/strategy shifts
<b>Requirements</b>	Policies, directives, and trends impacting, the technological, organizational, and budgetary requirements of the military
<b>Budget</b>	Status of federal budget, and future spending doctrine
<b>Defense Trends</b>	Sublevels of the DoD; tracks the current events of such offices as the Joint Chiefs of Staff
<b>Technology and Industry Update</b>	Technology & other trends in industry impacting Center business
<b>Personnel/Organizational Changes</b>	Relevant personnel & organizational changes within the federal government
<b>Quickhitters</b>	Flexible, catch-all category of information significant to leadership but which does not fit in any other category
<b>Executive Edge</b>	Information and trends in leadership & management of interest to senior executives.

Over time and through constant self-evaluation, this process has been improved and made increasingly robust. In this regard, the CSG relies on over 100 information sources (primarily unclassified), including government publications, official DoD sites, professional journals, and think-tanks. Additionally, the CSG exchanges information with others in its community of interest on an ongoing basis and brings back relevant information from conferences and symposia.<sup>4</sup> Unfortunately, a lack of concomitant improvement in disseminating this information out to the “edge” of the organization negated the breath of reach to an acceptable level.

Until recently, the CSG relied primarily upon sixty-minute presentations briefed at monthly strategic planning meetings to disseminate the information gleaned from environmental scanning. Aside from raising their situational awareness, there was an expectation that key information gleaned from each of these briefs would be passed down the chain to others in the organization via each of the individual departments. From the time to time, the CSG would also brief individual departments thus providing others further down the organization to this information. Much of this information remained at

<sup>3</sup> For a detailed discussion of environmental scanning see, Morrison, J.L (1992) “Environmental Scanning” in M.A. Whitely, J.D. Porter, and R. H. Fenske (Eds), *A Primer for New Institutional Researchers*, pp. 86 – 99, Tallahassee, Florida: The Association for Institutional Research. See also, Albright, Kendra, “Environmental Scanning: Radar for Success” *Information Management Journal*. Lemexa: May/June 2004, Vol. 38, iss.3; pp. 38.

<sup>4</sup> Community of interest includes CNA, NMAWC, NWC, SAIC, NWDC, among others. Aside from CCRTS/ICCRTS and others, the CSG attends AFCEA West, MILCOM, Current Strategy Forum, and Fletcher Conference.

the top of the organization, reaching up to 30 individuals directly, and perhaps trickling to twice that number after the brief. With over 2,000 engineers and scientists at the Center, this hardly presented an acceptable level of dissemination.

In an effort to reach further down the organization, the CSG invested time and effort in pushing information to internal customers based on their projects or scope of effort at the Center. Part of this effort involved the creation of a parsing list that broke down prospective recipients of information based on the various “communities” they belonged to. To date, this list has grown to over 400 individuals belonging to 50 different distinct communities addressing a wide spectrum of activity at the Center, from efforts in maritime domain awareness to business management, onto recruitment and retention activities. While this effort allowed the CSG to reach further down the organization and proved somewhat effective, it was not scalable enough to provide the breath of distribution necessary.

Even as it sought to enhance the aforementioned parsing list, the CSG worked to change the model to one where users could pull the information at their convenience and allow the broadest possible level of dissemination. Adopting Web 2.0 technology provided this capability. Moreover, it allowed the CSG to fully bridge the gap between the supply of information and the demand function from those who needed it; in effect, Web 2.0 provided the infrastructure to move the information in a cost/time-effective manner.

### **SSC Pacific and Web 2.0**

Using commercial-off-the-shelf (COTS) software, the Center’s IT department created a nascent technical infrastructure during the latter part of 2006 through early 2007.<sup>5</sup> The stated purpose of making these tools available was “to foster a new culture of collaboration by exploiting technologies associated with Web 2.0 and leveraging the forms of social interaction already familiar to our newest generation of employees.”<sup>6</sup> The use of open-source and COTS software provided a two-fold benefit to the Center as it provides technology already familiar to many of its younger and/or technically savvy workers as well as being low-to-no cost, particularly when compared to expensive custom or proprietary solutions. In much the same way, when the Corporate Strategy Group was evaluating the different ways to get information down to the working level personnel at the Center, it opted to take these existing tools and work with them rather than reinventing the wheel.

### **Leveraging Web 2.0 to Enhance Situational Awareness**

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<sup>5</sup> The software used includes a weblog server that utilizes the Movable Type publishing platform from Six Apart. Other parts of the Web 2.0 toolbox includes the use a collaborative information library server called MediaWiki (popularized by wikipedia.org), a chat capability powered by Jabber from the Jabber Software Foundation, as well as file-sharing and search capabilities for the SSC SD intranet.

<sup>6</sup> SPAWAR Systems Center San Diego, “Web 2.0 Tools” intranet site. See also an excellent discussion of Web 2.0 in Tim O’Reilly’s “What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software”, September 30, 2005, O’Reilly Media, Inc. <<http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>>

For the CSG, Web 2.0 technology yielded a variety of positive attributes. First and foremost, it addressed the issue of the scalability. With a calibrated increase in effort, the CSG was able to greatly increase the number of those with access to its information. Since its inception, the CSG weblog has achieved an average of 30 visits and page views per day. In addition, the CSG have to push the information via its parsing list to individual communities of interest, an often time consuming task. These communities, and many others, can now access the information on their own by visiting the blog. In contrast to its earliest methodology centered around a brief, the CSG could share its research and analysis with a much greater number than a select few. As Figure 1 demonstrates, the traffic to the CSG weblog has increased dramatically over a one year period, reflecting the increased reach of CSG-provided information.

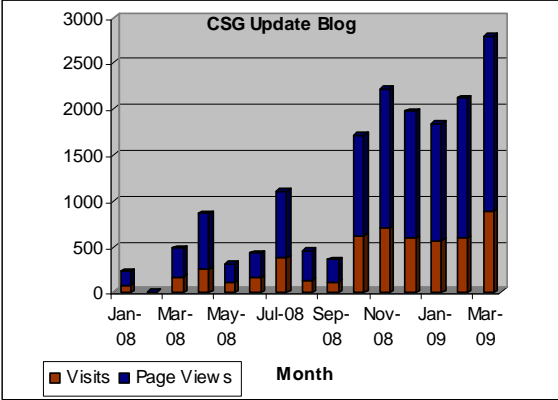
**Leveraging *Wiki's***

Aside from adopting weblogs, the CSG has successfully adopted the *wiki's* to improve its internal processes. *Wiki's* are collaborative information repositories, best exemplified by the popular *Wikipedia*. Via this collaborative whitespace, the CSG has improved its overall workflow, specifically in putting together the monthly environmental scan briefs and improving coordination.

Before adopting this technology, environmental scan briefings were e-mailed between whoever was currently working on it; creating issues of version and configuration control as well as clogging up the inboxes of several group members on a regular basis, a not-insignificant issue on the Navy's current IT infrastructure. Likewise, members were unable to readily see what the current and future topics being researched by other members were—leading to a duplication of efforts on several occasions.

While the DSG's internal wiki is not directly used by the rest of the Center, the time invested in creating and updating it has streamlined the workflow of the Group so as to make the administrative component of our work as efficient as possible.

Second, with the ability to feed information to the organization on an almost daily basis, it shifted the periodicity of environmental scanning from regular (roughly once a month) to continuous. Although scanning did and does take place on a continuous basis, the dissemination of said information did not, given the aforementioned mediums. Through a weblog, the CSG can expeditiously post a piece of information that will be available to the entirety of the organization. Center personnel do not have to wait for the next environmental scan brief to receive the information as it becomes available to them on an almost immediate basis.



**Figure 1 – CSG Blog Traffic Statistics**

Third, the CSG was able to change its entire methodology for transmitting information. Key information is first blogged with the imperative of delivering the information in a timely manner. Thereupon, this initial blog is followed by a detailed entry that aims to



provide a greater of analysis on behalf of the organization. If it merits specific attention from specific communities, the link to this entry is parsed out to said community. Finally, some of the entries become topics briefed at the monthly environmental scans. Whereas in the past much valuable material fell “on the cutting room floor” due to the time constraints of the brief, today the CSG can choose from a relative abundance of topics. Thus, the workforce across the SSC Pacific can receive the information without relying only, or primarily, on a periodic environmental scan brief.

Finally, from a leadership perspective the model at SSC Pacific has changed from senior leaders telling people to do something based on the environmental scan to having leaders ask their people what they are doing with the information they already have. With the expectation that folks are already privy to the information briefed at monthly environmental scans, senior leaders expect that at a minimum, the information provided has been internalized by a broader base of the organization.

## **Conclusion**

In sharing the CSG’s experience with Web 2.0 technology, this paper has sought to contribute to the literature concerning knowledge management and the leveraging of emerging technologies to enhance organizational performance. Based on an infrastructure and process centered around environmental scanning, the CSG sought at first to improve its “top-down” dissemination model through parsing efforts, although these were hampered by issues of scalability. Web 2.0 technology, specifically weblogs, allowed for the realization of a “bottom-up” approach that overcame the issue of scalability. With this method, the CSG can provide greater dissemination of information in a cost effective manner. Moreover, the availability of this information across the organization permits has changed the level of expectation of senior leadership from telling folks to do something based on the environmental scan, to having leaders expect that this information is being used as it becomes available.