

NAVAL POSTGRADUATE SCHOOL

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THESIS

EVOLUTION: ADVANCING COMMUNITIES OF PRACTICE IN NAVAL INTELLIGENCE

by

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June 2003

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**EVOLUTION: ADVANCING COMMUNITIES OF PRACTICE IN
NAVAL INTELLIGENCE**

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ABSTRACT

The US Navy is embracing the principles of Knowledge Management (KM). One of the key components of KM is the Community of Practice. Communities of Practice are groups that form to share what they know, and to learn from one another regarding some aspect of their work. Organizations are strengthened through an improved network of contacts and enhanced productivity from their personnel. Personnel benefit through peer-group recognition and continuous learning. This thesis seeks to provide an understanding of how the Naval Intelligence Community, through the implementation of Communities of Practice, can reduce duplication of effort, increase collaboration between its personnel, and better support the resources in its people. In this thesis, we have provided a blueprint for building a successful unclassified Community of Practice for Naval Intelligence. This blueprint is designed to support replication on classified networks

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EXECUTIVE SUMMARY

With the end of the Cold War the United States Intelligence Community (USIC) has been forced to expand its analytical reach to counter a wide variety of emerging threats. With increasing frequency the United States military is finding itself involved in smaller regional conflicts and pursuing terrorist groups across the globe. Intelligence officers are used to dealing with only fragmentary evidence and now are being further hamstrung by limited analytical depth and experience in these remote regions. Additionally the USIC has grown so large and the amount of raw intelligence data has proliferated considerably that even when enough evidence is made available to discern the enemy's intentions the information may be so dispersed that it is impossible to create an accurate assessment. Without a significant change in the way the USIC does business, the United States will become increasingly vulnerable.

With the end of the dotcom boom, private companies have reduced their workforce, requiring them to "do more with less". This reduction also left these companies faced with a need to transform the way they did business. Companies were forced to develop smarter business practices and create more efficient workforces. As a result, many companies turned to the field of knowledge management and specifically communities of practice to help identify best practices as well as the experts within their own organizations. These same principles can be applied to the intelligence community to increase analyst collaboration and capabilities.

Navy1630.com, a community of practice software tool, has been developed to provide naval intelligence officers with an online community space to foster collaboration and to improve their ability to support the Warfighter. This unclassified community of practice represents the first component of a three-phase process to integrate Communities of Practice into the naval intelligence community and to serve as a model for the entire USIC. During the initial phase, the effort will be focused on helping operationally deployed intelligence officers at the unclassified level. Using CompanyCommand.com, an Army community of

practice, as a blueprint, Navy1630.com incorporates many of the lessons and features of their successful community of practice necessary for the growth of an online intelligence community.

I. INTRODUCTION

Today's Naval Intelligence Community represents an extensive group of organizations and people with vastly varying responsibilities. We comprise an organization that is widely dispersed, with an ever-expanding mission and fewer people to accomplish the mission. Unfortunately, this growth in responsibility typically has not included an increase in training or time to learn the additional responsibilities. The intelligence Officer comes into the Navy from one of several commissioning sources (e.g., Officer Candidate School, Naval Academy, and Reserve Officer Training Corps (ROTC)) and then arrives at the Navy and Marine Corps Intelligence Training Center (NMITC) for their initial intelligence training. During the approximately six months of training, these new Officers receive basic tools of their trade, e.g. briefing skills, baseline knowledge of enemy orders of battle, cartography, etc.). However, upon arrival in the fleet, they quickly learn that many more skills are required to operate as an effective and competent intelligence Officer than what they learned at NMITC. Many times these individuals are the only Intelligence officer in the command and they are expected to perform in-depth intelligence analysis as well as function as a division officer, leading young Sailors. The blame cannot be placed solely on the school for fully preparing these Officers for duty. Given the wide variety of student backgrounds, newly commissioned ROTC and Naval Academy graduates, lateral transfers from other Naval communities, and Officer Candidate School graduates who may never have seen the ocean, let alone stepped foot on a Naval ship, to ensure that all new students in the Intelligence Officer Basic Course start with the same foundation, the NMITC must start each group at a very basic level. The job types that Naval Intelligence Officers must fill further complicates the NMITC's mission. A comment commonly heard among the junior intelligence Officers in the Navy is that "we are a jack of all trades and a master of none." Recent efforts have been made to prepare newly graduated NMITC students better by providing a multi-track training path tailored to their first assignments. Around the midpoint of their training, the students will receive their first set of orders. Near the end of their training at NMITC, they are 'tracked'

into a training program that focuses on the type of skills they will need for their first job. For example, if an officer received orders to an F/A-18 Hornet squadron, their training during the last weeks of school would include strike support, mission planning, cyclic operations (flight operations) briefing, and mission debriefing. However, this customized training only pertains to their first assignment. Rarely will a Navy Intelligence Officer serve two consecutive tours where he or she performs the same job function. This situation results in the Officers learning a new job each time they transfer. If the NMITC were going to prepare its young Officers for every potential job, it would require a training period similar to the aviation community where the Officers stay in school for almost two years.

Because we cannot afford either the cost or time associated with a two-year training cycle, the Naval intelligence community uses alternative methods for Intelligence Officers to hone their knowledge of the profession. In the case of first-term sea-going Intelligence Officers in squadrons and on ships, the most common way they learn is 'on-the-job' or in many cases 'trial by fire'. While on-the-job training can supply an effective method for learning many jobs, in most cases an intelligence Officer does not enjoy the luxury of re-learning the lessons of their predecessors. Re-learning takes time and given the nature of the job, time could cost lives, not to mention the wasted efforts that may have been used elsewhere to improve their analytical ability.

Historians typically cite the development of arts and leisure as a benchmark for defining a civilization. Emergence of art and leisure indicate that the members of the civilization have fulfilled their basic needs of food and shelter to the point where they possess free time. In the same manner, an intelligence analyst needs to accomplish his or her most basic tasks before they can reach a point where they are performing true analysis. Today's intelligence community is so overburdened with daily tasks, summary reports, and the like that an untrained Officer can spend his or her entire day just trying to fulfill these basic requirements.

The Navy has begun to embrace knowledge management and is investing heavily in the related technologies and programs. [DoN CIO, 2001] The key element of knowledge management is the Community of Practice [Wenger, 2002]. In short, Communities of Practice are collaborative groups of like-minded people focused on furthering their knowledge and proficiency in a specific area. The current focus of knowledge management projects in the intelligence community is limited to connecting its members to the vast amounts of available intelligence information. This type of knowledge management project is essential to improving the Naval Intelligence community's ability to access and utilize intelligence information. Unfortunately, too little focus has been directed on connecting the people throughout the Naval Intelligence Community.

To realize the full benefits of knowledge management a balance must be struck between the two types of connections. By only connecting people to information you create static databases and web portals. Focusing only on people to people connections and you create chat rooms and bulletin boards. Separately these connections provide some limited benefits for the users. However, making both connections in the same environment begins to build virtual Communities of Practice in which the whole becomes greater than the sum of the parts. By affording people the ability to find information and then by allowing them to collaborate within that same information set, a community can begin to create and share knowledge.

The focus of this thesis is creating a Community of Practice for Naval intelligence Officers. By designing, implementing and evaluating this element of knowledge management, the Naval Intelligence community can significantly reduce the time and effort required to get a sea going intelligence Officer 'up to speed.' By employing Communities of Practice as a tool to augment their learning, intelligence Officers will better use the time they are operationally deployed to learn what really matters: the analysis of intelligence information and technical proficiency that supports operational missions. In this thesis Communities of Practice are not viewed as a cure-all for the Naval Intelligence community, but for a community whose primary asset is knowledge, providing

better ways to capture, disseminate and utilize that knowledge will enhance the community overall.

This thesis will first examine how the intelligence community currently collaborates and exchanges information. The case study method is used to examine historical successes where collaboration has proven effective in enhancing the mission of Naval Intelligence Officers. Next, the background, history, and definitions of knowledge management and Communities of Practice are outlined and discussed. Following this discussion, five implementations of Communities of Practice, covering the commercial, corporate, and military sectors are reviewed. These different examples provide a varied illustration of how versatile and powerful Communities of Practice can become. The individual communities are examined, providing a description of their target audience, as well as what benefits their use has brought to the members of these communities.

As part of this thesis, a prototype Community of Practice for Navy Intelligence Officers, accessible on the World Wide Web, is detailed. The initial focus of the community will support sea-going intelligence Officers. This pilot implementation will test the feasibility and demonstrate the applicability of communities of practice to the Naval Intelligence Community. Reliance will be placed on those members who have been at sea or are currently at sea to mentor those who are preparing to deploy. It is argued that this community will become indispensable to sea-going intelligence Officers. In the final two sections of this thesis a roadmap will be drawn for arriving at this position, a plan to proceed to make our community of practice flourish will be articulated, and recommendations will be made for the future of Communities of Practice in Naval Intelligence.

II. THE PROBLEM

A. INTRODUCTION

In the wake of September 11th, the United States Intelligence Community has been placed under a microscope. The media, the Congress, and the American public are all searching for answers. How could arguably the world's best intelligence organizations fail to identify the signs of such a well-orchestrated attack? More importantly, what steps are being taken to ensure that a similar attack can never happen again? This occurrence is not the first time the intelligence community has been placed under such scrutiny. Similar questions were asked after Pearl Harbor, after the attack on the USS COLE, and after the embassy bombings in Africa. Many of the inquiries held after these incidents were able to identify several indicators that, in hindsight, seemed obvious and should have allowed analysts to predict the enemy's course of action. Of course, those looking for clues after the fact hold a distinct advantage. No longer are they trying to find a needle in the haystack. A few simple searches for keywords can provide a very short list of potential indicators. What may have contained a database of several million messages is suddenly reduced to just a handful of critical data points; data points which, if they had been identified earlier, would have allowed intelligence analysts to provide adequate warning. While the intelligence community never assumes the advantage of hindsight, it cannot be used an excuse for failure. It is the intelligence community's mission to find those critical data points among the millions of others and provide the national decision makers and military commanders with sufficient warning.

Most of the modern intelligence failures have not resulted from collection shortfalls but the direct result of analytical limitations within the Intelligence Community. The clues existed, just spread out through the intelligence community so widely that no single person or even single agency collated enough data to produce an assessment. The September 11th attacks offer an example how the intelligence 'community' can fail even though enough

information was available. It was too dispersed across the entire community to provide adequate threat warning. In 1994, French authorities foiled a plot by the Algerian Armed Islamic Group to fly an airliner into the Eiffel Tower, an event that was well known among anti-terrorism analysts. A year later in the Philippines, authorities were able to uncover a plan for mass hijackings of American planes over the Pacific. At the center of this plot was Ramzi Yousef, one of those behind the 1993 World Trade Center bombing. Additional evidence was uncovered during this investigation of a plan to crash a plane into CIA headquarters. With these events serving as the background information, the first bits of evidence related to the 9/11 attacks began to come into federal agencies. During the early part of the 2001, a flight school in Arizona contacted the Federal Aviation Administration. They were concerned about a Saudi student who spoke little English, a requirement for civil aviation, and wanted to learn how to fly commercial airliners. This report was followed in July 2001 when an Arizona FBI agent, who had worked on an FBI anti-terrorism task force for 11 years, wrote a memo in which he recommended that the FBI begin an investigation to determine whether al-Qaeda operatives were training at flight schools within the United States. His recommendation was based his investigative work in which he noticed a pattern of Arab men signing up at various flight schools in the southwest. [Elliot, 2002]

In August 2001, one month before the attacks, the U.S. Federal Bureau of Investigation (FBI) detained Zacarias Moussaoui; a man the French government said was linked to Islamic extremists groups. Moussaoui was arrested just a day after the staff at the Minneapolis based flight school where he was training raised concerns about him to the local FBI field office. Moussaoui's instructor grew suspicious when it was evident that Moussaoui lacked any basic flight skills but was still willing to pay the \$19,000 for a simulator-based course on the 747 jumbo jet. After his arrest, agents in Minneapolis sought a national security warrant to search Moussaoui's computer files but were turned down by lawyers at FBI headquarters for lack of evidence that he belonged to a terrorist group. [Gordon, 2003] In addition, during the month of August, the Central Intelligence

Agency notified the Immigration and Naturalization Service (INS) to prohibit Khalid Al-Midhar and Nawaf Al-Hamzi from entering the United States based on their connection with the Al Qaeda terrorist group. The INS responded by stating that the two individuals had already entered the country and subsequent bench warrants were issued for their arrest. In the few weeks before the hijackings Al-Midhar and Al-Hamzi purchased airline tickets for their 9/11 flights using their real names. Unfortunately before 9/11, no attempt was made to cross-reference between airline reservation databases and the various government agency watch lists. Over the next few days, the remainder of the 9/11 conspirators purchased their tickets, several of them using the same address and phone numbers as Al-Midhar and Al-Hamzi. [Jonas, 2003]

Given that the agencies involved could not access airline reservation data, it may still have been impossible to predict the specific time and place of the 9/11 attacks. However, data existed to indicate an increased threat to commercial airliners and their potential use as weapons. The troubling issue concerns the fact that agents in Minnesota were never made aware of the memo from Arizona, and the White House Counter-terrorism team was never advised of either the arrest or the memo. As a result, no one collected or connected enough clues to identify the threat in time. Representative Saxby Chamblis, chairman of the Select Intelligence Terrorism and Homeland Security Subcommittee, summarized it as “those charged with connecting the dots on terrorism do not always get the dots.” Because of the various congressional hearings and investigations, the intelligence community has pledged to increase their information sharing between the agencies and within the agencies themselves. [Elliot, 2002]

Yet, increased information sharing should not serve as the only goal. Analysts are already overwhelmed by the amount of information available. Simply opening the information flow more widely between the various agencies will only further complicate this situation. Over the next few years agencies will be extremely proactive ensuring that they share all of the data with other agencies. While the desired outcome is to ensure that all of the key decision

makers are presented with an accurate and comprehensive picture of the situation, the initial effect will further increase the information overload already being experienced by analysts. The real goal should be set to foster and facilitate collaboration at the analyst level. A very significant difference exists between increasing the dissemination of the raw intelligence or even finished intelligence products and increasing the amount of analyst-to-analyst exchange. Instead of just pushing data around, analyst exchanges allow individuals to discuss the context surrounding information and to bring their various experiences and 'corporate' knowledge to bear on the problem. However, as most analysts know, collaboration within the United States Intelligence Community does not come easy.

A 1999 study, sponsored by the DCI's Community Management Staff, the Executive Agent of the Community Operational Definition of the Agile Intelligence Enterprise (CODA), and the National Intelligence Production Board, was commissioned to examine policy, procedural, and cultural barriers to collaboration within the Intelligence Community. The study evaluated how collaboration took place among the Central Intelligence Agency, National Security Agency, Defense Intelligence Agency, National Imagery and Mapping Agency, Federal Bureau of Investigation, Department of Energy, and the Department of State's Bureau of Intelligence and Research. Interviews conducted with senior intelligence executives identified several cultural issues that have dissuaded agency collaboration. Among the top reasons given were lack of common goals for collaboration across the community, lack of trust between organizations and individuals, perceived lack of security in computer systems and databases, perceived lack of benefit from collaboration efforts, and inadequate reward systems to support collaboration. (Hall, MITRE) The report concluded that United States Intelligence Community is not designed to facilitate collaboration among agencies or even analysts within the same agency. So why does the intelligence community experience such difficulty collaborating? . Before examining the factors that are limiting collaboration and thereby leaving the country and its deployed military vulnerable, it may be best to examine an

historical example of a successful intelligence organization that not only collaborated well, but did so during one of the most trying times in American history.

B. STATION HYPO: A SUCCESS STORY

During the Second World War Hawaii was home to a majority of the United States Pacific Fleet as well as to a small group of intelligence analysts and cryptanalysts working in a windowless vault known only as Station HYPO. Station HYPO fell under the direct command of Commander Joseph Rochefort, a Naval cryptologist. Rochefort worked with Commander Edwin Layton, who served as the senior intelligence Officer on Admiral Chester Nimitz's staff. The analysts at Station HYPO were able to crack the Japanese Naval codes and read a vast majority of the orders that were being sent to the Japanese Naval forces. At its peak during May 1942, Station Hypo analyzed and reported on as many as 140 decrypted messages per day. The assessments made using these messages were fed directly to the senior decision makers, Nimitz at Pearl Harbor, MacArthur in Australia as well the President and Joint Chiefs back in Washington. While the efforts of Station HYPO continuously aided the allies defeat the Japanese, nowhere did their efforts produce a greater impact than at the Battle of Midway. Japanese message traffic pointed to an impending attack on Midway Island. Admiral Nimitz, relying on the analysis performed by Layton, Rochefort, and the entire staff at Station HYPO, committed all of the operational aircraft carriers to the battle. Defeat here would have left the United States vulnerable to Japanese Naval forces all the way to the West Coast. Seen as an extremely risky decision by many, Nimitz placed his faith in the intelligence assessments of Station HYPO. In the end, the Station HYPO's predictions of when and from what direction the Japanese attacks would commence were only off by five minutes and five degrees. The resulting counterattack by the American carrier planes inflicted such heavy damage to the Japanese carrier force and its escorts that the Japanese fleet was forced to withdraw from the central Pacific. This event served as the turning point for the war in the Pacific.

The most significant individual success factor was the timely and accurate support provided by Rochefort and his unit supporting the Battle of Midway. [NSA.gov, 2003]

A number of factors contributed to the success of Station HYPO. The most obvious, the breaking of the enemy's codes, allowed the analysts to read the orders being sent to Japan's deployed Naval forces. However, cracking the Naval codes did not equate to access to all Japanese encrypted communications. The Japanese used many channels to relay orders and regularly changed the cryptologic keys to encrypt the messages. The cryptologic key changes required the analysts at HYPO to perform traffic analysis and eventually uncover the new key sequence. Station HYPO relied on two distinct non-technical advantages; its small size and its very focused mission. With the analysts all collocated in Hawaii, collaboration was made relatively simple. The volume of messages, even at its peak of 140 per day, represented a manageable volume such that all of the analysts were able to read every message. [Potter, 1976] Discussing different theories of enemy intentions and constructing a comprehensive assessment of the situation could be done on a face-to-face basis. The analysts knew each other and their respective strengths and weaknesses.

Even with the smoke still rising above Pearl Harbor, the analysts at Station HYPO knew that their ability to perform their mission could significantly influence the outcome of the war. At the time, the United States was operating on the defensive with a numerically inferior force. Providing timely intelligence and advanced warning was seen as the only way the United States could hope to even the odds and hold on long enough to reinforce the nearly crippled Pacific Fleet. Commander Rochefort was not afraid to perform predictive analysis. Committing the entire remaining US carrier force based on intelligence predictions from Station HYPO represented an extremely risky venture. If Rochefort erred it could have lead to the defeat of US forces in the Pacific. The analysts were not concerned about receiving credit for their work or dreaming about being promoted. In fact, when Admiral Nimitz submitted an award for

Commander Rochefort based on his efforts leading up to Midway, it was denied. The Secretary of the Navy provided a very simple explanation of why he did not think a medal was warranted; Rochefort had simply been doing his job. [Potter, 1976] In completing their mission, Station HYPO responded to a very clearly defined audience, the senior decision makers in the Pacific. Should a question ever surface about a particular assessment, the decision makers relied only upon a single point of contact to request clarification. This close relationship also allowed the analysts at HYPO to learn what most interested their target audience. They were able to focus their efforts sharply in line with the developed campaign plan and based on feedback from the senior leadership shift focus to the most critical tasks. Another facet about Station HYPO also contributed to its success. The country was engaged at war. A significant portion of the administrative requirements and routine tasks were streamlined. The analysts were able to see the direct impact their efforts were making on the war. Not that war is the desired climate, but there are some advantages that cannot be replicated during peacetime. [www.history.navy.mil, 2003]

C. TODAY'S INTELLIGENCE COMMUNITY

Unfortunately, replicating the success of Station HYPO remains extremely difficult in today's Naval Intelligence community. HYPO's access to the enemy's communications was unprecedented. In today's technologically advanced world, encrypted communications have become increasingly available to both governments and individuals. While it may be easier to protect communications and data, today's technology has also produced new ways to gather intelligence information from open source methods, like the little known newspaper published online in the target country, to the technological advances that allow large-scale collection of enemy information. The resulting volume of potential intelligence information is overwhelming. Information overload is occurring everyday. Even if the fourteen member organizations of the United States Intelligence Community (USIC) [www.Intelligence.gov, 2003] dedicated a small group of individuals to focus on a particular topic it would be physically impossible to read all of the

messages and reports that may relate in some way to their topic of interest. Given the amount of data being collected everyday by intelligence agencies it may not be necessary for our adversaries to go to great lengths to secure their communications. Indeed these adversaries may be able to hide critical information and messages in plain sight. This massive inflow of information only further increases the burden on today's intelligence analysts ability to identify the critical pieces of intelligence information.

In an attempt to keep up with the amount of information, the USIC has grown. The current USIC is comprised of fourteen different organizations. Each of these conducts its own analysis and provides finished intelligence products to everyone from the President to our allies to the individual pilot sitting in the cockpit of a military aircraft. The organizations themselves are complex entities with thousands of personnel. Every year each one must compete for funding and justify its staffing levels. The success of these individual organizations is usually measured by the amount of intelligence products generated and the value of those products to the customers. Unfortunately, many times it appears that the volume of production is more heavily weighted in the equation than the value to the customer. This skewed standard requires that an organization provide a continuous stream of original and timely products. Just as news reporters are concerned that a big story might be 'scooped' by a competitor, so the various intelligence agencies are concerned that if intelligence organizations share at the early stages of their analysis with other agencies then a chance exists that someone else may release a report and receive the credit, thereby mitigating cross-organization cooperation. This culture extends even further down to the individual analyst level within each of the organizations. Just as the agencies receive credit by being the first to release a product, the analysts within these organizations are acclaimed for being the first to supply their superiors with new information and assessments. The quickest way to advance is to be seen as the person with all of the answers. This pressure to report first can result in analysts even within the same organization keeping valuable information away from their fellow analysts. [www.intelligence.gov]

D. INFORMATION DISPERSION

By its very nature, intelligence analysis presents a unique challenge. This challenge partially results from a combination of vast amounts of collected information combined with a smaller than required workforce exacerbated by all of the non-intelligence related administrative work that Intelligence personnel are required to perform, requiring them to find shortcuts to get through the information. While every effort is made to review all information collected, significant portions are filtered out and only the most obvious pieces of information are harvested. It resembles the 'low hanging fruit' analogy. The over-tasked intelligence professional tends to stop searching after they find the easy to identify pieces of intelligence. After an initial filtering, data is prioritized based on the organizations intelligence production requirements and analysis conducted on the highest priority information. The vast majority of the data never receives any in-depth analysis.

Despite all of the available information, analysts are forced to work with only with fragmentary evidence. They must use these brief glimpses into the adversary's activities in an attempt to construct a comprehensive assessment of the situation and thereby discern an enemy's course of action or intentions. It can be compared to putting together a 1,000-piece puzzle with only a handful of the pieces, and then based on what the puzzle would look like completed, trying to determine what the creator of the puzzle was thinking while it was being created. Then based on their assessed frame of mind they try to predict what types of puzzles may be produced in the future and when they might be created. With such a large intelligence community, several individual agencies may receive multiple 'pieces of the puzzle.' Yet without sharing and collaborating with other agencies, no single agency will ever fully understand the overall picture. The combination of the immense volume of collected data and numerous analytical centers has created its own unique problem, information dispersion. The United States Intelligence Community has grown so large that even when enough data have been collected to allow accurate prediction of the enemy's

intentions, the individual pieces of data may be so strewn over the entire intelligence community that none of the analysts feel that they have collected and synthesized enough evidence to make a definitive call. This information dispersion can prove very costly for both the immediate situation and for the long term credibility of the United States Intelligence Community, when it is later determined, usually during congressional hearings, that enough data had been collected to predict the enemy's action. What may seem to an analyst at one particular organization as a series of seemingly unrelated events may be the missing pieces required for another analyst to complete the picture. These organizations may all bring slightly different perspectives and prior experiences to the task, which leads them to draw different conclusions from the available information. To handicap oneself by limiting the amount of interaction with other analysts, for fear of being scooped, can result in very limited and biased assessment.

E. ANALYTICAL DISPERSION

With the demise of the Soviet Union and the end of the Cold War, the mission of the United States Intelligence Community has shifted to covering a larger number of real and potential adversaries who are all vying for a seat at the table of world power. This re-focus of intelligence assets has led to the intelligence mission becoming extremely complicated and fragmented. Just as the Second World War provided Station HYPO with a clearly defined mission, the Cold War allowed the country to focus a majority of its intelligence resources on primarily just one adversary. Today's analytical effort is much more diffuse. While there are clearly defined 'strategic competitors' that will remain a priority, the intelligence community constantly must respond to crises in regions and countries that were previously thought below the threshold for intelligence reporting. For example, in 1999 Australia and the United States formed the core of a multinational force that was sent to help the newly independent country of East Timor transition to a democratic state. While East Timor had formed part of Indonesia, a country that the USIC and especially the Australian intelligence

agencies had monitored for years, it was extremely difficult to find any East Timor experts or even someone who spoke the native dialect. The same thing happened in the days following the 9/11 attacks as the USIC scrambled to find experts on Afghanistan. Until then, Afghanistan was positioned extremely low on the priority list. Osama Bin Laden and the Al-Qaeda organization had always been listed as a priority but when the mission included taking down the Taliban government, which had provided him safe haven, the search began for anyone who may have gained experience in Afghanistan. Most of the resident knowledge had been developed during the Soviet occupation, and resided in the minds or file cabinets of those analysts who looked at the problem day in and day out. Unfortunately, those analysts retired years ago. Much of the hard copy intelligence was never converted to electronic format and the tacit knowledge that they held in their heads retired with them. In most cases, even when the individuals are identified they are usually spread over the globe making the creation a centralized, co-located intelligence task force with qualified people time consuming and expensive. During crisis periods it is relatively easy to reassign these individuals for temporary duty, but the amount of time it takes to assemble the experts in one location is a drawback

During non-crisis periods, it may be impossible to gather all of the experts in one location. Many of the regional commands try to host annual conferences that allow analysts from the various intelligence organizations to discuss common issues. Individual analysts use these conferences to make contacts with others who have been examining the same issues. Sometimes they discover analysts or even entire organizations that they were previously unaware of. For example for any given 'strategic competitor' a group of military intelligence analysts will monitor that country at the respective regional intelligence center, a group at the Defense Intelligence Agency, the Central Intelligence Agency, and the State Department's intelligence division. In addition, analysts at each of the military service intelligence agencies (i.e. Office of Naval Intelligence, National Air Intelligence Center, and National Ground Intelligence Center) focus their respective areas of expertise within the country of interest. Deployed units may

be more focused at the tactical level than anyone else. These operatives possess very limited analytical depth and can find themselves deployed with very little advanced warning. A carrier battle group that may have been conducting pre-deployment drills off Hawaii may find itself two weeks later providing support to a small operation such as East Timor. The battle group is going to want to know a lot about the normal operating patterns of the other military forces within the region; information which up to that point may have been below the interest threshold for the USIC.

While it may seem wise to invest at least some analytical effort on every country in the world, it would be impossible to justify the staffing requirements except for those rare occasions where a previously unknown part of the world suddenly appears on the front page of the morning paper. The President's declaration to hunt down terrorists worldwide has only further added to the diffusion. While very difficult, the intelligence community must transform itself to keep up with the ever-expanding mission.

F. LOSS OF GRANULARITY

Military Intelligence organizations also suffered another setback in their ability to provide timely critical intelligence support when the Joint Intelligence Centers were formed during the late 1990's. While concentrating analysts from the various services into a handful of regional intelligence centers should have led to an increased analytical ability many believe that it has done just the opposite. [Studeman, 2003] Deployed and forward-based units are facing threats that appear sometimes literally just on the other side of the fence, e.g. US military forces deployed to the Arabian Gulf prior to Operation Iraqi Freedom. When newly deployed units enter a threat region, they depend heavily on the support from the regional intelligence centers and to a lesser extent the national intelligence agencies. However, within a few days, or at the outside weeks, the units quickly grow less and less dependent on the support of the regional intelligence center. The level of granularity in the various joint intelligence products does not meet the needs of the unit. Just by the very nature of being deployed to a threat region a unit's organic intelligence support, while only

forming a fraction of the size of a joint intelligence center, quickly outperforms the rear echelon support. Though the support of deployed forces stays high on the list of priorities at most Joint Intelligence Centers, unless it is a time of war, support of the Theater Commander (formerly CINC) tends to take precedence. By focusing its support to the Commander level, the theater intelligence organization loses the granularity that deployed units need.

Joint intelligence centers keep a 24-hour watch in place to try to satisfy around-the-clock intelligence requirements. However, an overwhelming majority of the watch standers are newly arrived personnel. The real analytical depth resides in the 'day shops', which work during normal business hours. Even then, bureaucratic processes further complicate the analysis. The chain of command, and for analytical products, the chain of release, is not strictly motivated by the facts, but takes into account other factors whether political or organizational. These secondary factors tend to 'mellow' analysts predictions and assessments. While it is understandable and possibly inevitable that senior leadership will seek to temper the assessments of their respective intelligence centers for fear of being accused of 'crying wolf', it can exert a very negative effect on future analytical rigor. Analysts become dissuaded from making calls for which they are not highly certain will be correct. They become equivalent to news reporters reporting events of the previous day or politicians failing to take a position on either side of what might happen, leaving himself or herself plausible deniability regardless of the outcome. The process has grown so ingrained that today hardly any predictive analysis is forthcoming. Most of the intelligence reporting is nothing more than a journalistic rehash of the previous day's activities.

[Studeman, 2003]

The performance and therefore the careers of analysts are rated on their ability to support their command's mission. While the overall mission of the United States Intelligence Community is to protect America, how each of the different intelligence organizations supports that mission varies widely. The regional military intelligence centers are placed in a difficult position. The various service organizations that were combined to form them had previously been

supporting their deployed service units. Now those units turn to the regional centers. At the same time the theater commanders and their staffs rely on the centers for their intelligence production as well. Unfortunately, the deployed units want tactical level details and predictive analysis, while the theater commanders want strategic level assessments. As previously discussed, the analysts are already suffering from information overload and are stretched too thinly to provide two levels of analysis. While these regional centers usually include 'supporting the Warfighter' in their mission statements, many spend a disproportionately large amount of their effort directly supporting the theater commanders. It is not difficult to see why; the theater commander is a four-star admiral or general with a one-star intelligence Officer, while most of the deployed units are commanded by an O-5 or O-6, with an even more junior Intelligence Officer. Members of the joint intelligence centers, especially junior analysts, are not going to advance if they develop a reputation for telling a four star admiral to wait.

G. LESSONS LEARNED

In the military, the concept of 'lessons learned' represents a formal method for passing on what worked and did not work for a particular unit. The idea suggests that units that might perform the same mission later will not need to make the same mistakes; they simply read and integrate the lessons learned reports. Theoretically, by building on the lessons learned, each unit should be more successful than the previous one. Unfortunately, lessons learned remain largely ineffective.

The incidents and lessons themselves must be captured by a member of the unit and then submitted up the chain of command. The unit commanders then review the lessons and determine which ones will be included in the overall lessons learned message to other units. A certain amount of self-censorship takes place during this process. When units identify mistakes that, in hindsight, seem obvious and preventable, they may not want to admit it to the rest of the military. Additionally unit commanders may not feel that some of the lessons from the junior members merit critical attention to include in the overall lessons

learned. That is not to say that there is not some benefit in the final product, but to realize the benefit future units must undertake one very important responsibility; they must read and implement the lessons learned. While the senior members of a unit make a point of reviewing the lessons learned available, more junior members may not. The reason is two-fold: first, they may not be aware of the availability of the lessons learned, and second, they may find them useless because they are unable to contact the people who wrote them to follow up their questions. In the Naval Intelligence community, we get significantly smaller at higher ranks. As a result, the more senior you are, the more likely you will know a much larger percentage of your peers as well as know how to get in touch with them. This ability allows the senior members of the community to converse regularly to compare and discuss lessons learned. In the junior ranks of the Naval Intelligence community, the sheer number of personnel make it less likely that a deploying junior Officer will know the individuals on the other end of the latest lesson learned, much less how to get in touch with them. Though the Officers who wrote the lesson learned would usually provide point of contact information in the lesson learned, it is unlikely that they will be available at that contact point for more than a few months. In short, the lessons themselves are static documents that may not include all of the required background information pertinent to the situation. Though there is a general format and template for these lessons learned, rarely are all questions of future consumers answered in the lesson, as to do so would take an inordinate amount of time. As units are deployed all over the world, the amount of face-to-face turnover between units is quickly diminishing. In many situations, a unit may deploy to a region with no one to turn over with. Weeks or even months may have elapsed since another unit was present. The newly arrived units must rely only on the lessons learned. Those before them have most likely returned home or rotated to another part of the globe, making it nearly impossible to ask questions related to the lessons learned.

The fact the U.S. military has not experienced a catastrophic intelligence failure in the last decade should not serve as validation of the current analytical

model. Most of the intelligence requirements today are being satisfied by a small percentage of the analysts who are willing to work overtime and dig and sift through mountains of data to answer the simplest of questions, while someone else within the intelligence community has likely already answered many of these questions. This wasted time and effort could have been put to better use focusing on analysis that moves beyond what the enemy did yesterday allowing the Intelligence Officer to predict what will happen tomorrow. While the challenge of working with only fragmentary evidence may never be overcome, solutions must be found to ensure collaboration between the right analysts at the right time to provide timely and accurate assessments including adequate warning to both senior decision makers and the Warfighter alike.

III. KNOWLEDGE MANAGEMENT AND COMMUNITIES OF PRACTICE

A. INTRODUCTION

The first part of this chapter will present background information on Knowledge Management (KM). The remainder of the chapter will focus on Communities of Practice (CoP), “the keystone of effective knowledge strategy” [Wenger, 2002] and the primary focus of this thesis.

KM has existed in some fashion in the US since World War II. [Prusak, 2001] It was then observers in US aircraft production factories noted that building the second airplane of a given type took considerably less time than the first one, and the second airplane contained fewer defects than the first. In other words, it was shown that workers really did learn from experience combined with documented processes. In the fifties, the Rand Corporation began to analyze and codify observations of this type. The phenomenon was given its classic expression in Nobel Prize-winning economist Kenneth Arrow’s 1962 article, “Learning by Doing.” [Arrow, 1962] In “Learning by Doing”, experience is equivalent to knowledge, but that is not always the case.

Unfortunately, since the coining of the phrase “Knowledge Management” it remains nearly impossible to find a clearly understood and agreed upon definition. Each “expert” in the field offers their own definition, as does each purported practitioner of KM. This difficulty in defining KM has caused the failure of many KM initiatives before they ever get off the ground. To address this question, the terms knowledge and management will first be looked at independently and then together, providing a working definition from which to move forward to a discussion of Communities of Practice.

B. KNOWLEDGE

- Knowledge is created by people. It reflects their know-how and involves their education, experience, thinking, decision-making, and all other

capacities for creating choices and taking action. Corporate knowledge is derived from individuals and may be documented and embedded in organizational resources. Knowledge is more than data and information. [FAA Team Technology Center, 2001]

- *Merriam-Webster Online Dictionary* [<http://www.m-w.com>] defines knowledge as **1 a** (1). The fact or condition of knowing something with familiarity gained through experience or association. (2): acquaintance with or understanding of a science, art or technique **b** (1): the fact or condition of being aware of something (2): the range of one's information or understanding <answered to the best of my knowledge> **c**: the circumstances or condition of apprehending truth or fact through reasoning: Cognition **d**: the fact or condition of having information or of being learned <a man of unusual knowledge> **2 a**: the sum of what is known: the body of truth, principles acquired by mankind; applies to facts or ideas acquired by study, investigation, observation or experience.

1. Additional Definitions

- Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of the knower. In organizations, it often becomes embedded not only in documents or repositories, but also in organizational routines, processes, practices, and norms. [Davenport and Prusak, 1998]
- Knowledge is about reasoning about information and data to enable performance, problem solving, decision making and learning [Tom Beckman, IRS, 2002]
- Knowledge is the human capacity (potential and actual ability) to take effective action. [David Bennet]

2. Types of Knowledge

In most KM circles, knowledge is separated into two different types, explicit and tacit. In broad terms, the difference in the two types of knowledge is that explicit knowledge can be written down, stored and managed by information systems. Tacit knowledge is the knowledge that resides in the minds of people. While moving the data associated with explicit knowledge may be relatively simple, sometimes as simple as the push of a button, tacit knowledge is extremely difficult to transfer. This difficulty exists because we must find ways to get the knowledge from the mind of the person into a form that can be electronically shared. Purists argue that tacit knowledge once transformed into a more explicit form ceases to be knowledge--that it is only information--and that information only becomes knowledge again when comprehended the human mind. [Barth, 2002]

Data and information comprise the two agreed upon components required to create knowledge. *Figure 1* depicts knowledge as part of a hierarchical structure built on data and information, suggesting creating knowledge requires both data and information.

3. Data

The term data is derived from the Latin word meaning something given. It contains a specific, limited or discrete bit of communication. If accurate, it may be called a fact. Data is considered a subset of information that is used for analysis. A single data item carries no meaning and yet can prove essential and extremely valuable in the development of information. Computers easily process data. [FAA Team Technology Center, 2001]

4. Information

Information is refined data that has been placed in context and given meaning. Information may add value in various other ways such as by qualifying or labeling. Information contains a message that is determined by recipients to

be information. The etymology is complex to form and perhaps to explain. Labeling or quantifying data may clarify it so that it provides information. Messages attempt to convey information and imply both a sender, either a person or automated media, and a receiver who receives the data in a meaningful context. No message is conveyed unless the message is meaningful to the receiver. [FAA Team Technology Center, 2001]

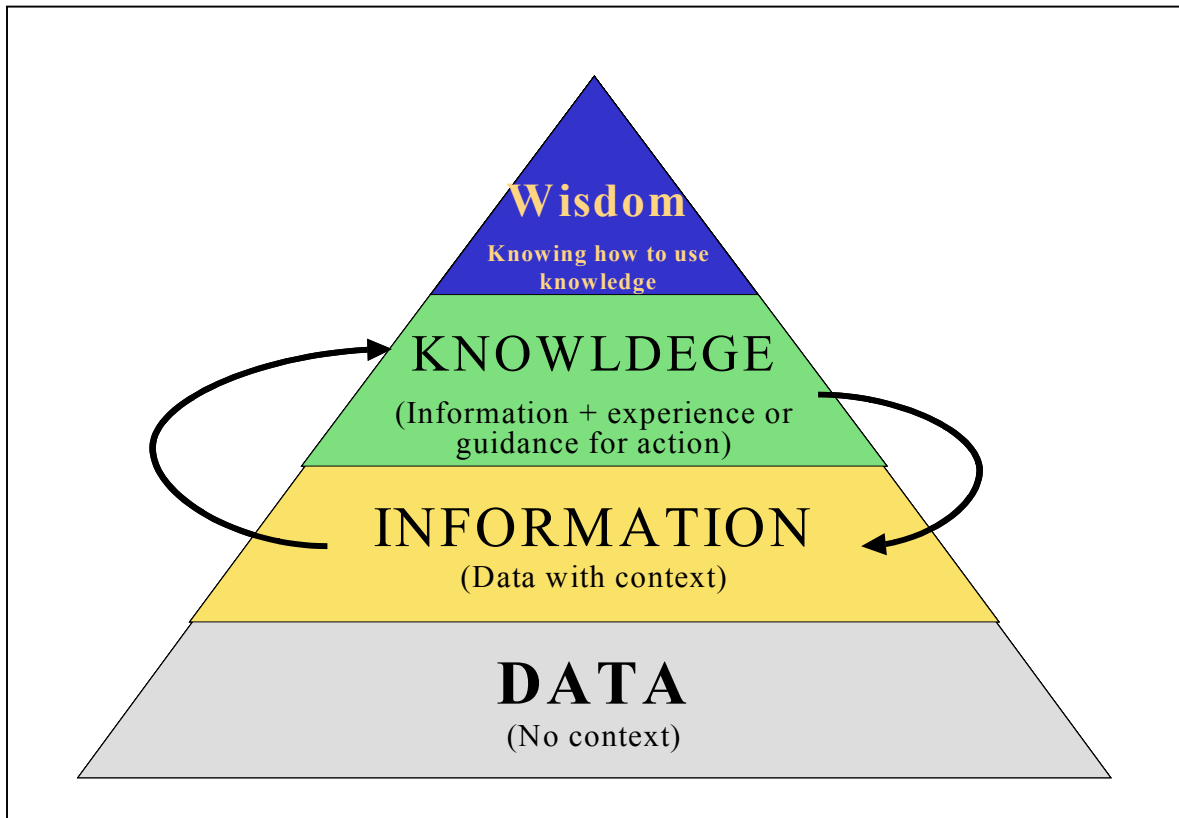


Figure 1 Knowledge Hierarchy

Figure 1 adds two other representations. The first applies to the wisdom block topping the pyramid. Varying arguments in current literature debate the definition of the concept of wisdom. Some use wisdom and knowledge interchangeably; others argue a distinct difference between the two, while several equate wisdom and ‘understanding’. For the purposes of this discussion, wisdom is treated as being different from knowledge and is defined as the ability to take competing and different pieces of knowledge, weigh the short and long-

term effects, and make a rational decision. Wisdom, simply stated, allows the ability to implement knowledge.

The second item in *Figure 1* shows the arrow looping back to information. As knowledge is created, data and information result as positive byproducts. Creating knowledge provides new data and information that others can further use in the formation of new knowledge. Current literature provides several illustrations of the “cycle of knowledge” with the profound conclusion suggesting that data, information and knowledge are not static entities. As they are used, new data, information and knowledge are created.

C. DATA TO KNOWLEDGE – MAKING THE LEAP

Most people intuitively think they know the difference between data and information, but for illustrative purposes the following example to examine the two is provided:

Vehicle Type	Tanks	APC's	HET's	Support Vehicles
In Garrison	12	10	18	32
In Training Area	12	13	22	10

Table 1 Knowledge Example Sample Dataset One

In the table above, each row is merely a collection of five data points. Taken individually one lists vehicle types, the second lists the number of something in garrison, and the third counts the number of something in a training area. When taken individually these three data lists are relatively meaningless. However, by combining the data from two or more lines together, new information may be available. What information can be gleaned from these data sets? One can determine the type and number of vehicles present in a particular garrison as well as the type and number of vehicles in a training area. No additional information is afforded by this data set.

Vehicle Type	Tanks	APC's	HET's	Support Vehicles
In Garrison	12	10	18	32
In Training Area	12	13	22	10
Missing from Garrison	12	14	25	16

Table 2 Knowledge Example Sample Dataset Two

By adding another line of data, highlighted in gray, additional information is now made available. Adding the "missing from garrison" data line allows one to determine that vehicles are indeed missing from garrison. The additional information alone does not help locate the missing vehicles but only notes that vehicles are missing. By making several assumptions, it can be shown how the analyst can gain knowledge from this data and information. The first assumption is that the analyst maintains an inventory of the vehicles normally at the garrison and so can determine whether all vehicles are accounted for. The second assumption suggests the analyst can access some historical data or someone's experience. The access to this historical experience may be based on personal experience or through the experiences of others the analyst regularly contacts. When the conditions of these two assumptions are met, the analyst now controls the tools to create knowledge. So armed, the analyst can make judgments about the disposition of the vehicles and depending on his historical knowledge of the activities of these vehicles, where they might be located and what they might be doing. The key, regardless of how the analyst's assessment turned out, is for the analyst to capture the lesson for himself or herself and to pass them along to others focused on the same problem

Moving from information to knowledge represents a big step, one that is difficult to complete using only computers, but is instead one best completed in the human mind. Because knowledge is composed of more than data points, trends, or information, it combines an accumulation of facts or information that holds meaning beyond the facts themselves. In the human sense, knowledge is the understanding of consequences from a group of facts. These consequences can be experienced or deduced, but in either case are known. [Nicholls, 2000]

In the example above, the analyst looking at the data and information about the locations and status of a group of military vehicles will rely on experiences, other information and intuition to make a determination of the location of the missing vehicles. The analyst may know that during a particular time of the year the unit at this particular garrison usually conducts training in the field. When the analyst makes a determination and publishes the results, knowledge has been created. Data and information alone are considered of marginal use by themselves, but by fusing the various pieces of information and comparing the resultant data sets against a person's experiences, and their personal or group knowledge base, useful knowledge that can be acted upon is created

D. MANAGEMENT

- *Merriam-Webster Online Dictionary* [<http://www.m-w.com>] defines management as: **1:** The act or art of managing; the conducting or supervising of something. **2:** Judicious use of means to accomplish an end. **3:** the collective body of those who manage or direct an enterprise.

Much like knowledge, management can be described as a hierarchy that includes leadership, management, and supervision.

- Leadership: Involves dealing with purpose and change at a strategic level.
- Management: Can be equated to dealing with groups and priorities at an operational level.
- Supervision: Equates to dealing with individual tasks and people, and is conducted at the tactical level of an organization.

[Wagner and Hollenbeck, 1992]

Given the multiple and varying definitions of both knowledge and management, it becomes easy to see why a common definition of either term let alone the combined terms remains so elusive. A working definition of Knowledge Management, followed by several statements about what KM does not involve is provided to set the context for the remaining sections of this thesis.

Knowledge Management refers to strategies and structures for maximizing the return on intellectual and information resources. Because intellectual capital resides both in tacit form (human education, experience and expertise) and explicit form (documents and data), KM depends on both cultural and technological processes of creation, collection, sharing, recombination, and reuse. The goal is to create new value by improving the efficiency and effectiveness of individual and collaborative knowledge work while increasing innovation and sharpening decision-making. [Barth, 2002]

The following statements should help further clarify KM by ruling out several commonly misconceived notions about what KM is.

- *Knowledge management is not knowledge engineering.* Knowledge engineering has comprised a vital part of computer science but is barely even related to knowledge management. Knowledge management is a business concept and falls in the domain of information systems and management, not in computer science. [Tiwana , 2000]
- *Knowledge management is about process, not just digital networks.* Management of knowledge has to encompass and improve business processes. Drucker warns that focusing on the *T* and not the *I* in *IT* will deliver little. [Tiwana , 2000]
- *Knowledge management is not about building a “smarter” intranet.* A knowledge management system can use your intranet as its front end, but one should never be mistaken for the other. Saying that your intranet is your knowledge management system is something as senseless as saying a jetliner is the cockpit. The “just-add-water” approach traditionally used with packaged intranets collapses face down when used for knowledge management. [Tiwana , 2000]

- *Knowledge management is not about a one-time investment.* Knowledge management like any other future-oriented investment (i.e. training and education) requires consistent attention over a substantial period of time even after it begins to deliver results. [Tiwana , 2000]
- *Knowledge management is not about enterprise-wide “Infobahn’s.”* While enterprise integration helps, the primary focus of KM is on creating, getting, importing, delivering, and most importantly helping the *right* people, apply the *right* knowledge at the *right* time. [Tiwana , 2000]
- *Knowledge management is not about “capture.”* Document management vendors suggest otherwise, but knowledge management is not about capturing “knowledge.” An inevitable loss of context occurs when documents are “sanitized” for use across the company. Knowledge, in its entirety, cannot be captured. [Tiwana , 2000]

Though the above discussion of KM still leaves questions unanswered, it is sufficient to allow movement past the arguments about the definition of KM and to the focus of this thesis, Communities of Practice (CoP).

E. COMMUNITIES OF PRACTICE (COP)

The term “Communities of Practice” was first coined by Etienne Wenger and Jean Lave in their 1991 book, Situated Learning (Cambridge University Press) which was based on work completed in the late 1980’s in part on observing and interviewing Quartermasters on U.S. Navy ships. [Lave and Wenger, 1991] They found that “legitimate peripheral participation” was important to learning. In other words, “shop talk” helps people learn. Younger or less experienced workers learn from older or more experienced workers by a gradual increase from “peripheral” to full participation in their job. [Kimble, 2001] As these workers begin to participate, their experience helps them to develop “tacit knowledge.” According to a 2001 study by Deloitte and Touche, an

estimated 70 percent of an organization's knowledge base is tacit or subjective in nature and is based on the personal experiences and the context of learning events of its members. [Deloitte Research, 2001] In this chapter, we will discuss the nature and form of Communities of Practice and distinguish among other forms of group communication. A discussion of the different types or levels of a Community of Practice along with their benefits and pitfalls will also be covered.

1. What are Communities of Practice (CoPs)

Communities of Practice involve groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis. [Wenger, McDermott, and Snyder, 2002] Although the term "Community of Practice" is relatively new, Communities of Practice are not. These groups have appeared in some form since the beginning of humankind. In the early history of modern man when most of the earth's inhabitants were nomads following the food source, young hunters honed their skills by learning from the stories and experiences of their more experienced elders or peers and then gradually developing the performance skills needed to take game. They learned the lessons of those who had already done it, and from those unsuccessful unfortunates who provided test cases without needing to repeat the mistakes. Circa 1000 AD, the beginnings of formal Communities of Practice are evident. Though not called a Community of Practice, the Blacksmiths Guild provides an example of a true Community of Practice where members could meet and share best practices within their profession. Communities continued to be formed through history. In the United States, Minutemen during the War for Independence, militias during the War of 1812, Underground Railroad operatives preceding the Civil War, and the Pinkerton detectives during the late nineteenth century, offer additional examples of other such similarly constituted communities. In the modern corporate world, similar groups formed since people in organizations realized they could benefit from sharing their knowledge, insights, and experiences with others with similar interests or goals. One of the best-known, early examples of a Community of

Practice was formed by the copier repair technicians at Xerox Corporation. [Brown and Gray, 1995] Through networking and sharing their experiences, particularly the problems they encountered and the solutions they devised, a core group of these technicians proved extremely effective in improving the efficiency and effectiveness of efforts to diagnose and repair Xerox customers' copy machines. The impact on customer satisfaction and the business value to Xerox was tremendous. However, for the most part, this cadre formed a voluntary, informal gathering and sharing of expertise group, not a "corporate program."

Historically the military have devised ways to transfer knowledge to our newcomers. Standard operating procedures (SOP), doctrine, and pass-down logs tend to create a culture of community. With these tools, the military has done a commendable job of capturing and transferring explicit knowledge to new members. An example can be found in the military aviation communities Hazard Report System (HAZREP). Through this system, any issue, technical or otherwise, that can affect safety of flight is rapidly disseminated throughout the entire aviation community and immediately incorporated into training and maintenance programs. Unfortunately, despite technological progress some of the military's most powerful tools for passing explicit knowledge to newcomers are being underutilized, resulting in valuable knowledge loss.

Officers clubs provide a fitting example of a pre-Internet community of practice. In previous years junior Officers gathered at Officers Clubs on a regular basis outside the hierarchical rank-based confines of their command to build relationships, to trade lessons learned and to be mentored. Meetings at the O-club provided an opportunity to learn important lessons from other Officers from one's command as well as those from other organizations, and to participate in the free exchange of ideas that helped to improve the community. The success of this community was largely based upon the fact that members did not view their interactions at the Officers' club as work.

Technology and modern organizational methods have given rise to the creation of a society of cubicle dwellers within organizations. Before the days of chat, email, or the Internet, workers could choose two primary options for

interacting with people; they could meet with them face to face or talk directly with them on the phone. Now it is more common for people to avoid this type of live social contact. Many workers today seem to prefer sending an electronic message rather than picking up the phone and collaborating or meeting in person.

For example, in the early 1970's the Navy photographer mates and photography Officers in the Southern California area would hold quarterly gatherings for the whole region to discuss changes in the industry, exchange lessons learned, make new contacts and learn more about their community. Smaller groups in the Navy photography community met more frequently to continue their learning. [Bonjorni, 2003] It seems as technology has developed, people have chosen not to interact on a personal level, losing one of the most valuable learning tools available to an organization. While using impersonal tools to communicate offers distinct advantages, like speed of delivery of information and disregard for time zone, disadvantages arise also. The biggest disadvantage to this form of communication is that it lacks context and limits the ability to interact dynamically.

2. Types of Communities of Practice

In defining the types of Communities of Practice, it is easier to view them as more of a spectrum that compartmentalizing them into specific types. For this discussion, two types of Communities of Practice will be examined. The self-organizing Community of Practice is found at one end of the spectrum and the sponsored Community of Practice is located at the other. Successful Communities of Practice exist at both ends and many places in between.

a) Self Organizing

Self Organizing Communities of Practice are self-governing as well. They pursue the shared interests of the group's members. These Communities of Practice add value to an organization by sharing lessons learned, acting as distribution points for best and emerging practices, providing forums in which issues and problems can be raised and resolved and, in general, by learning

from each other. They are extremely resilient in that as members come and go as interests and issues shift and evolve the community itself remains solvent. Over time, then, communities and their members adapt. They can even evolve into a formal or sponsored Community of Practice. Alternatively, they might disband if enough of the members decide they are no longer deriving benefit from their membership. This type of Community of Practice benefits since it can continue to exist without the “baggage” or negative stigma brought by association of the site with a given organization that can come from organizational sponsorship. In many instances, members will be reluctant to participate in a community they believe is being “controlled” by an organization. When a community is spontaneously created or at least without direct organizational sponsorship, its members tend to feel more comfortable contributing to the growth and success of the community. Communities of this nature are seen as a place to go outside the confines of an organization to get advice, assistance, or support from knowledgeable people. The downside to the self-organizing Community of Practice is they can sometime be difficult to organize without a “benefactor.” If the members’ organization sees the participation in Communities of Practice by their workers as a waste of time, or threatening to management’s control, it may prove difficult for those workers to participate fully and may result in a short-lived community.

b) *Sponsored*

Sponsored Communities of Practice are initiated, chartered, and supported by the leadership of an organization. Sponsored Communities of Practice are expected to produce measurable results that benefit the organization like improved return on investment (ROI). They secure needed resources and they receive more formal roles and responsibilities. Even so, they appear much more self-governing and wide-ranging than the typical working group. The greatest benefit provided to a Community of Practice by organizational sponsorship is shown in the support of the organization’s leadership. By sponsoring a Community of Practice, an organization is telling its workers that it recognizes the benefit of sharing knowledge within the

organization and trusts its workers will be better educated and more productive because of their participation in that community. Additionally, gaining official sponsorship provides the necessary resources to ensure a community is able to survive. The downside to organizational sponsorship remains the potential baggage associated with an organization's support of a community. Regardless of the organization, some individuals will maintain and offer a negative opinion of the organization for some reason or another. If enough of the potential community members share this negative opinion of the sponsoring organization, the community will fail. The other issue affecting organizational sponsorship is the possibility for bureaucratic bumbling and interference in the growth and operation of the Community of Practice. Fear by the organizational leadership of losing control, resulting in policies placing limits on participation in a given community of practice will quickly end the usefulness of said community.

Figure 2 provides several examples of organizational relationships to Communities of Practice with a brief outline of the challenges faced by these communities at each level. It should be noted however, regardless of where on the spectrum of community type a community falls, to ensure success it must obtain at least tacit support by the organizational leadership. Additionally the leadership must be willing to cede some control and allow the community to serve as a place where workers of an organization go for the free exchange of ideas and information that support learning, professional growth and innovation. For a Community of Practice to succeed in the Naval Intelligence Community, support must be forthcoming from the senior leadership. To garner this support we must demonstrate the benefits communities of practice can bring to the organization, including providing more efficient learning, increased creativity, improved collaboration and an innovative spirit that heretofore has been unseen, untapped, and unrealized.

Communities of Practice, when properly implemented will allow the Naval Intelligence Community to experience a cultural revolution. This revolution will result in a shift from the current model of 'I've got a secret' to one of collaboratative professionalism where intelligence professionals recognize the value of sharing and embrace collaboration. In the next chapter, examples of other organizations, government and corporate, that have embraced Communities of Practice are provided.

Relationship	Definition	Challenges typical of the relationship
<i>Unrecognized</i>	Invisible to the organization and sometimes even to members themselves	Lack of reflexivity, awareness of value and of limitation
<i>Bootlegged</i>	Only visible informally to a circle of people in the know	Getting resources, having an impact, keeping hidden
<i>Legitimized</i>	Officially sanctioned as a valuable entity	Scrutiny, over-management, new demands
<i>Strategic</i>	Widely recognized as central to the organization's success	Short-term pressures, blindness of success, smugness, elitism, exclusion
<i>Transformative</i>	Capable of redefining its environment and the direction of the organization	Relating to the rest of the organization, acceptance, managing boundaries

Figure 2 Communities of Practice Relationships to Official Organizations. From: "Communities of Practice, Learning as a Social System" by Etienne Wenger as published in the Systems Thinker, June 1998

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IV. PROLIFERATION OF COMMUNITIES OF PRACTICE

A. INTRODUCTION

Even though an industry-wide definition or commonly agreed upon standards for Knowledge Management does not exist currently, in the past several years some government agencies and industrial firms have begun to recognize the value in its practice. Specifically, they have started to see the value in Communities of Practice. However, as with the adoption of most new business practices, industry is far ahead of the government in its adoption and support of Communities of Practice. Certain organizations in the U.S. Government are attempting to catch up to industry in this field. In fact, some like the US Army are leading the way with CompanyCommand.com and PlatoonLeader.org, two communities of practice which will be discussed in this chapter. When it comes to knowledge management initiatives, most organizations start by connecting people to static information within the organization. In the Navy, this static information is generally organizational in nature and contained in documented policies, procedures, instructions in varying forms including, emails, PowerPoint presentations, and record message traffic. The Navy has undertaken several initiatives that help to connect its people to organizational information, the largest of which is Task Force Web, the Navy's organizational portal. [www.tfw.navy.mil, 2003] Individual communities in the Navy also have begun their own similar initiatives. This strategy is adequate as a first step, but it must not end there, especially in an organization whose people are perceived as their greatest assets. The Navy as a whole and individual communities within the Navy need to focus more on connecting its key performers, allowing them to learn from and with each other.

The future is coming faster than we are adapting to it. Organizations are straining from the impact of increasingly complex work at all levels of the modern knowledge organization. Two key indicators of the slow rate of adaptation include large increases in the number of employees who are reporting they feel

overworked and the reporting of the significant amounts of time employees are spending looking for what they need to make decisions. [Price Waterhouse Coopers, 2000] Recognizing this adoption delay, many software vendors seeing new markets have seized the idea of facilitating knowledge sharing with software that links people together and to the static or organizational information. Orbital Software, and Tacit Knowledge Systems [Wenger, 2002] are two examples of such companies, offering software that allows one person in search of advice or expertise to locate another person, typically by asking a question and either accessing a database of existing answers or waiting for an 'expert' to respond. Other companies such as Communispace, and Tomoye Inc. [Wenger, 2002] provide tools that focus on building Communities of Practice.

One way to evaluate this type of technology is to consider a virtual version of the Officers Clubs, where members are able to go and interact in cyberspace with others in their field to trade best practices and discuss what works and what does not. By regular interaction among members of the group, certain members become the recognized expert. This interaction creates opportunity for learning, professional growth and serves as a catalyst for building personal and professional networks. We are not suggesting that the patrons of the Officers Clubs were completing large amounts of work, but the connections to others in the community that were made at the Club were invaluable to the junior Officers learning the profession. We support this argument with personal experiences over the last ten years. On almost every occasion we have been a part of a group of Intelligence Officers getting together outside of work, the conversation inevitably turns to work: what works within our community, what is broken, and how can we fix it.

Some in the Intelligence community today argue that they do not need or want a technological tool to do what they can do in person. Unfortunately, in the business of intelligence in the Navy, the opportunity to head down to the local Officers Club and grow the personal networks that allow us to get those questions answered does not exist. In the past decade, many Officers Clubs in the Navy have practically been abandoned, falling victim to changes in the

political and social environment. Additionally a majority of Navy Intelligence assignments are listed as 'one of one' jobs with few if any other Intelligence Officers co-located. The death of the Officers Clubs and the dispersed nature of our assignments make physically interacting with others in our field difficult, if not impossible.

It is not suggested that these tools can take the place of dynamic face-to-face interaction, but in the work environment today, they provide a mechanism to bridge the gaps and in some cases enhance the learning and recreate some of the associated benefits that came from the personal interaction at the Officers club. Yet, more than just implementing software solutions is required to make these tools successful. As previously stated, a cultural revolution in the Intelligence Community must occur allowing these tools to pay dividends. In order for people to employ these tools and make them productive and successful, participants must believe that when collaborating in electronic Communities of Practice, they will not be wasting their time. It means those who participate, especially those in search of information, must receive relevant answers and information in a timely manner. Additionally, experts must be motivated to share their knowledge and do so in ways that are helpful to the community.

As stated in Chapter 3, the model of 'I've got a secret' must be shattered. With the culture in the Intelligence Community being portrayed as one of secrecy, members are generally reluctant to share what they know. Unfortunately, this behavior carries over to other areas like professional development, where secrecy tends to be counterproductive. This hesitance creates a hurdle for a successful Community of Practice to overcome. However, as with the personal face-to-face networks that once flourished in the Officers Clubs around the world, in most Communities of Practice, many experts only need peer recognition as an incentive for their continued participation. Whether driven by the ego or a true desire to support the community, as individuals in the community are noted and ranked by their peer group for providing relevant, useful information, they become the recognized expert and their incentive to continue participation grows.

An example of this willingness to participate is demonstrated at Clearly Business, a London-based portal aimed at small businesses. [Santosus, 2002] Using software from Orbital, Clearly Business provides a forum where 105,000 registered users seek advice from experts and share ideas. According to the company, the willingness among the site's experts to help others who are challenged by running a business is reinforced by a rating system, which allows users to recognize those experts who provide the most relevant, useful answers. Experts get no other incentive to share what they know, and Clearly Business asserts that they don't need anything else. [Santosus, 2002] The key to getting the most out of Community of Practice tools is to deploy them for use by a community of like-minded individuals. Getting those people to share what they know can be as easy as recognizing them as the “go-to” person.

In the remainder of this chapter, implementations of communities of practice in the commercial space, government, and industry will be examined followed by a discussion of the basic requirements for fostering successful Communities of Practice.

B. COMMUNITIES OF PRACTICE IN ACTION

In this thesis, five institutions have been selected as examples of successful communities of practice. The first one at Xerox was chosen because it was one of the first documented Communities of Practice in the corporate sector. [Brown and Gray, 1995] The second firm resides in the commercial sector and actually runs as a for-profit Community of Practice. The third Community of Practice is found at Royal Dutch Shell. The success of this Community of Practice has been well documented. It serves as an excellent example of how organizations can benefit from the use of communities of practice. The final two communities of practice are military in nature. The first, Program Management Community of Practice (PMCoP), was created to serve the Department of Defense program management personnel. The final community, CompanyCommand.com, was created by several junior Officers with a focus on improving Officer leadership at the US Army Company level.

1. Xerox Palo Alto Research Center (PARC)

One of the most well-known and documented Community of Practice was discovered at Xerox in the 1980's. The management at Xerox was seeking a way to boost the productivity levels of its field service staff. As most corporate and bureaucratic institutions do, they commissioned a study before making a decision. An anthropologist from the Xerox Palo Alto Research Center (PARC), a member of the work-practices team, traveled with a group of technical representatives to observe how they actually performed their jobs -- not how they described what they did, or what their managers assumed they did. That research challenged the way Xerox thought about the nature of work, the role of the individual, and the relationship between the individual and the company. It was the first shot in a revolution. [Brown and Gray, 1995]

What the observer saw was tech reps often made it a point to spend time not with customers but with each other. They'd gather in common areas, like the local parts warehouse, hang around the coffee pot, and swap stories from the field. [Brown and Gray, 1995] Your average middle manager might have looked at this scene and determined that to increase the productivity of these workers; management could do a better job of routing their tech reps, eliminate the conversations and dead time and thus create a more efficient workforce. Fortunately for Xerox, the observer was trained as a cultural anthropologist who recognized the value in the time spent with co-workers. The observer recognized the time at the warehouse was anything but dead. The tech reps were not slacking off; they were doing some of their most valuable work. Field service, it turns out, is no job for lone wolves. It is a social activity. Like most work, it involves a community of professionals. The tech reps weren't just repairing machines; they were also co-producing insights about how to repair machines better. [Brown and Gray, 1995]

These tech reps epitomized knowledge workers. Through their informal conversations and exchanges taking place in the warehouse, coffee mess, and water coolers, knowledge transfer was taking place. Because of the observer's findings, Xerox decided to try to expand the use of these informal conversations

and did so in the name of innovation and learning. Xerox began a pilot program in the Denver area, issuing two-way radio headsets to each of their tech reps. They called the radio frequency over which the tech reps communicated the “knowledge channel.” Using these two way radios the tech reps were able to ask each other questions, to identify problems and to share solutions as they came up with them. Though this system improved the transfer of information between their workforce, limitations were acknowledged. The most obvious drawback is that this method of communication and transfer was conducted in real time, but the only way the knowledge was captured was tacitly in the heads of those technicians that happened to be on the “channel” during the discussion. And if it was not recorded, this tacit knowledge could never be made explicit. Recognizing this shortfall, Xerox took the next step and, working with their group in France, created a system they call Eureka, which by their definition is “an electronic knowledge refinery.” This tool was designed to organize and categorize databases of best practices generated by the field staff. Technically this system is a relational database of hypertext documents, but it is an electronic version of war stories told around the coffee pot -- with the added benefits of an institutional memory, expert validation, and a search engine. [Brown and Gray, 1995]

This system relies on voluntary information exchanges. Any technician, regardless of their rank, can submit a best practice, but they are not required to do so nor are they explicitly rewarded for participating. In Eureka, the payoff results in social and intellectual capital: the incentive to be a good colleague, to contribute, and to receive knowledge as a member of the community.

The experiences described provided the catalyst for the massive growth in the area of ‘Knowledge Management’. The potential value of such endeavors was made clear to many in the business community, especially those with an eye on the bottom line. Unfortunately, since the government and military specifically is not ‘profit oriented’ part of this lesson has been slow to sink in. As indicated earlier, the rate of adoption by the military of emerging best practices from the corporate world has been glacial. Without the pressure to show a profit or increase value to shareholders, the progress made has resulted from those

military leaders with a clear vision of what these methods can produce in terms of productivity and leadership.

2. Las Vegas Online

The first community in the commercial space we evaluated is the one hosted at www.lvol.com. A screenshot from the site is provided in *Figure 3*. Though not self-defined as a Community of Practice, it exhibits many qualities



Figure 3 Las Vegas Online Screen Shot. From www.lvol.com

of one. The site contains significant amounts of historical and new knowledge. Recognized experts are available to answer the questions of its members. This site has registered over 5,000 members, maintains thousands of Las Vegas related documents, and over 3.2 million unique visitors have visited the site since January 2000 as evidenced by a discussion board area with many topics having over 1,000 posts. Las Vegas Online demonstrates that you can cultivate an extremely successful active community base around a small passionate core. Through this knowledge exchange, members of this community are able to save themselves time and money, which greatly exceeds the cost of participating in the community (cost = time).

3. Royal Dutch Shell

The energy industry is collaborative by nature. Oil exploration, for example, requires talent across many disciplines involving petrophysicists, geophysicists, geologists, and engineers, among others. Many energy firms were veterans at collaborative learning and knowledge sharing long before the arrival of the Internet. [McDermott, 1999] Arie de Geus led strategic planning during his 38-year career at Shell, and is widely credited with initiating the concept of the learning organization. He asserts, "The ability to learn faster than your competitors may be the only sustainable competitive advantage." [Haimila, 2001] The leadership at Shell believes their ability to discover knowledge and disseminate it throughout the organization gives them a competitive advantage and helps them to leverage their investments better than their competition. In the mid-1980s, for example, Shell bought exploration leases in the Gulf of Mexico, even though it did not yet have the knowledge and technology to explore and drill wells in water that deep. [Haimila, 2001] The management at the Deepwater Division encouraged regular, informal brainstorming sessions among their engineers. The result was that before the leases in the Gulf of Mexico expired, this interchange ignited the spark needed to help the engineers figure out how to explore and dig deep-water wells. This type of 'water-cooler' discussion is often the best way to mine the tacit knowledge required to solve complex problems.

“The understanding that knowledge is socially embedded helps Shell to reap significant rewards – especially with the advent of the Internet.” [McDermott, 1999] Shell has linked 13 Communities of Practice with more than 10,000 users. By Shell’s estimate, it sees benefits of at least \$200 million a year from community-driven knowledge sharing initiatives.

4. Program Management Community of Practice (PM Community of Practice)

Three years ago, the Defense Acquisition University (DAU) was part of a group of DoD organizations brought together by leadership at the Pentagon to leverage the principles of knowledge management with a heavy reliance communities practice to replace the DoD ‘Deskbook’ System. Deskbook contained a database of acquisition policies, processes, and tools developed in 1995. This database represented a first attempt to use on-line databases to institutionalize an automated acquisition information process to provide current, appropriate and meaningful information and tools for the Office of the Secretary of Defense (OSD), Services, Defense Agencies and Acquisition Managers to effectively and efficiently acquire products, systems and services. [Dorohovich, 2003] The replacement concept developed by the group consisted of hundreds of Communities of Practice providing working knowledge and expertise for DoD’s workforce believing that Communities of Practice offered the solution to harvesting the tacit knowledge that they would lose over the coming five years.

During the same time, the U.S. Navy was making significant investments in Knowledge Management and expressed interest in leveraging knowledge management and Communities of Practice to support its acquisition workforce. At the time, the acquisition work force was capturing and sharing best practices and lessons learned through the use of existing collaboration technologies. [www.PMCoP.navy.mil, 2003], but the cost of providing personalized consulting support to Navy program offices was growing increasingly expensive. Working together in the same DoD Knowledge Management team, the Navy and DAU partnered together to develop the Program Management Community of Practice

(PM Community of Practice) (Figure 4) designed to reduce consulting costs, to improve professional development of its members and to create a place where members of the community could come and learn from one another.

In February 2001, a group of senior DoD Program Managers and Deputy Program Managers met for two days of community building activities. The



Figure 4 PMCoP Screen Shot. From the PM Community of Practice Website at www.pmcop.navy.mil

requirements identified by the group were used to create the PM Community of Practice website. The main PM Community of Practice site contains sub-communities established for Systems Engineering, Contract Management, Risk Management, and Total Ownership Cost. PM Community of Practice launched

for public access in October 2001 at the DoD Program Executive Office and Systems Commander Conference. [www.PMCoP.navy.mil, 2003]

The PM Community of Practice provides acquisition workers with the ability to locate knowledge on demand, from any location, with confidence that it has been validated by the community. To make this knowledge transfer happen, PM Community of Practice provides tools to assist with tasks and grants access to the knowledge and experience of others who have already completed similar tasks. The Navy's vision for PM Community of Practice was designed to provide the acquisition worker with relevant knowledge-on-demand through the establishment and progressive development of specific acquisition communities. They decided on an evolutionary, community-based approach that integrated government and industry workers to capture knowledge. [Tomoye, 2003] PM Community of Practice provides acquisition professionals across DoD with knowledge-sharing opportunities, problem-solving capabilities, and a source for continuous learning. The following is one example from the PMCoP website of how this Community of Practice has benefited its members;

The Experience of one PM CoP Community Member

Steve Parker was a new program manager with the U.S. Navy working on the AEGIS program's livefire test - i.e. testing that the weapon would work. His battle group consisted of an aircraft group and aircraft carriers that had full radar capability – very powerful ships. Steve was tasked with developing a risk management process for the livefire test. He spent three months laboring over his plan and one week before it was due, an editor at PM CoP put him in touch with Art Willoughby, a veteran Risk Manager with 30 years experience. Art reviewed Steve's draft Plan of Action and Milestones (POA&M, made experienced suggestions and shared his own risk management plans – all with the goal of helping Steve succeed.

"I could have saved an entire month of research and work by using PM CoP's resources from the start." – Steve Parker, novice Risk Manager

[From www.pmcop.navy.mil, 2003]

Now, less than two years after the launch of PM Community of Practice, the site has attracted over 3000 registered members, added more than 8000 knowledge contributions, grown four primary communities, established two special interest areas, and started over 40 workspaces. The site administrators estimate that community membership grows at a rate between 30 to 50 people a week. The continued growth in membership at PMCoP demonstrates that once people realize the value in a community like PMCoP they not only become members, but also tell others about the benefit of the site, generating more members and an increased knowledge and skill base.

5. CompanyCommand.com

In the January 2000 *Federal Computer Week* article “Cultural Change Trumps Technology” by Craig Sincok, the US Army’s task force leader for enterprise network, a position in the new office of the Chief Integration Officer (CXO) he stated “The Army is moving forward with its cultural changes, new business practices, ‘infostructure’ management and Army Knowledge Online portal upgrades, but needs to do a better job of ‘mentoring and training future leaders.’ He further suggested that ‘Bureaucracies don’t do that well,’ but the Army is working on it.” At the time Mr. Sincok did not know about a burgeoning Community of Practice whose focus was established to overcome the very shortfall he identified.

CompanyCommand.com (*Figure 5*) was created by four enterprising young Army Officers whose mission is to “connect company commanders--past, present, and future--together in a conversation specifically about building effective units.” [CompanyCommand.com, 2003] The founders of this community believe that “professionals who are fiercely resolved to prepare for combat and who continually share what they are learning with each other will be more effective and will grow more effective, combat-ready units.” [CompanyCommand.com, 2003]



Figure 5 CompanyCommand.com Screen Shot. From the CompanyCommand.com Website at www.companycommand.com

a) *How They Started*

Two Army Officers, Nate Allen and Tony Burgess met at West Point in 1987, and both commissioned as Infantry Officers in 1990. Nate served in the 10th Mtn Div, the 509th Infantry Battalion (JRTC OPFOR), and the 25th ID (L). Tony went to the 82nd Abn Div and then to the 25th ID (L) where Nate and he were neighbors and commanded companies in the same Brigade.

The way things worked out Nate and Tony both spent a long time on Brigade Staff before taking command – Tony spent 18 months and Nate knocked out over 24! During their time in “purgatory,” they observed other commanders and took note of both the good and the bad that they saw. While in command they kept notes and continued to share ideas, usually during the evening when they hung out on their front porch talking about what was going on in their companies. They thought, “Wouldn’t it be great if commanders could easily share their ideas with like-minded leaders across the Army?” Every Captain that they talked to got excited about finding a way to better share ideas and, to

an Officer, everyone had already considered capturing some of their command experiences in writing. However, there was no easy forum for this to happen and, once out of command, most Captains were off to the next busy assignment with no established system for them to remain tapped into Company Command.

For many Army Officers, Company Command is professionally the greatest experience their lives. They naturally spend time reflecting on it and have the desire to both remember it and pass on some of what they learned and experienced to others. Those who are preparing to take command naturally would love to tap into the ideas and insights of the thousands who have gone before them.

As the Internet exploded, Nate and Tony realized that the web was the vehicle to accomplish what they wanted to do. By chance, they ran into Steve Schweitzer who volunteered to build the web page (for free!), and the ball was rolling. Over the course of two months, they grew a team of Officers who offered up their input and time to help make CompanyCommand.com a reality. The original team included Pete Kilner, Tom Woodie, Chris Engen, and Steve Delvaux. On 2 February 2000, they purchased the domain name CompanyCommand.Com and Steve Schweitzer began building the actual web page. [Burgess and Allen, 2003]

b) What CompanyCommand.com Has Accomplished

The establishment and support of this Community of Practice constituted an all-volunteer effort until this year. The success of the site has led the CompanyCommand.com Team to seek additional support directly from the Army. Based on the metrics used by the CompanyCommand.com team to evaluate the value of their site, they have proven very successful. "CompanyCommand.com uses the quantitative measures of unique/repeat visitors, number of downloads, and subjects searched for and found, submission rates and time saved in wheel re-invention." [Nate Allen, 2003] In 2002, the CompanyCommand.com site served 352,000 unique visitors who downloaded 136 gigabytes of information, logged 16 million hits, and viewed 2.7 million pages. With the ongoing deployments in early 2003 related to the operations in Iraq, the

CompanyCommand.com team saw a marked increase in the activity in their Community of Practice. They experienced record levels of activity in January and February 2003. For example, in January alone they witnessed 60,000 unique visits, logged 2.6 million hits and served over half a million downloads. The most popular downloads were products that support unit deployments to the Persian Gulf – Such as after action reports (AAR's) and lessons learned from previous Gulf operations, deployment checklists, NBC operations and advice and tools for unit family readiness groups. [CompanyCommand.com Team, 2003]

CompanyCommand.com has since partnered with The United States Military Academy (West Point), and three of the original four members of the team are enroute to institutions of higher learning to earn PhD's before returning to West Point as permanent professors. The Army has recognized the value in the Community of Practice created by these young Officers and has pledged to support the further development and growth of their Community of Practice as well as developing and supporting Communities of Practice at other levels of leadership (i.e., PlatoonLeader.org).

These examples provide a quick look at some successful Communities of Practice in several different types of organizations. Thousands of examples of Communities of Practice exist in the commercial space. These Communities of Practice operate in one form or another for most interests, from raising rabbits to repairing cars, e.g. www.doityourself.com. In the corporate space, thousands of Communities of Practice thrive, all recognizing the benefit of such tools. In the federal government and specifically the military, many groups can be considered by definition a Community of Practice, whether or not the participants are aware that they comprise one.

The Chief's mess, where senior enlisted personnel dine aboard Navy vessels, constitutes one such community. They also gather to share their experiences and talk about what is working and not working for them in their work areas. They trade best practices, exchange lessons learned and create new ideas for overcoming the challenges they face. Though not widespread, Communities of Practice are becoming an integral part of the way the some Navy

organizations do business in the 21st century. Once viewed by many as just another management fad, Communities of Practice have emerged as a stunning success in the everyday business operations of these organizations. Communities of Practice have contributed to the competitive advantage of organizations using them by bridging the knowledge gap within the organization. These Communities of Practice provide a forum for knowledge workers and warriors to exchange thoughts, ideas, insights, best practices, and to find solutions to real problems.

C. BUILDING SUCCESSFUL COMMUNITIES OF PRACTICE

Throughout our research, we found many checklists, ideas, and recommendations for building successful Communities of Practice. Some came from industry, e.g., Tomoye (www.tomoye.com), others from the academic press like the book *Cultivating Communities of Practice*, by Etienne Wenger and one Navy specific guide developed at Naval Sea System Command called *The NAVSEA Communities of Practice Practitioners Guide* that we have provided as an appendix to this thesis. There are as many guides available for building successful Communities of Practice, as there are definitions of knowledge management. To make this discussion more manageable, we have chosen to highlight only the ones that we used. One of the more authoritative guides available today is in the book *Cultivating Communities* by Etienne Wenger, Richard McDermott, and William Snyder, three well-known authors in the fields of knowledge management and Communities of Practice. The authors provide the “seven principles for cultivating Communities of Practice” [Wenger, 2002] shown in *Figure 6*.

While conducting research for this project, we read many books, articles and guides, as well as conducted personal interviews with team members of CompanyCommand.com and PMCoP.navy, and believe these seven principles capture best what the broad range of guides, tools, checklists, and recommendations entail about building and sustaining communities of practice.

For any person, group or organization embarking on the creation of a Community of Practice we highly recommend this book.

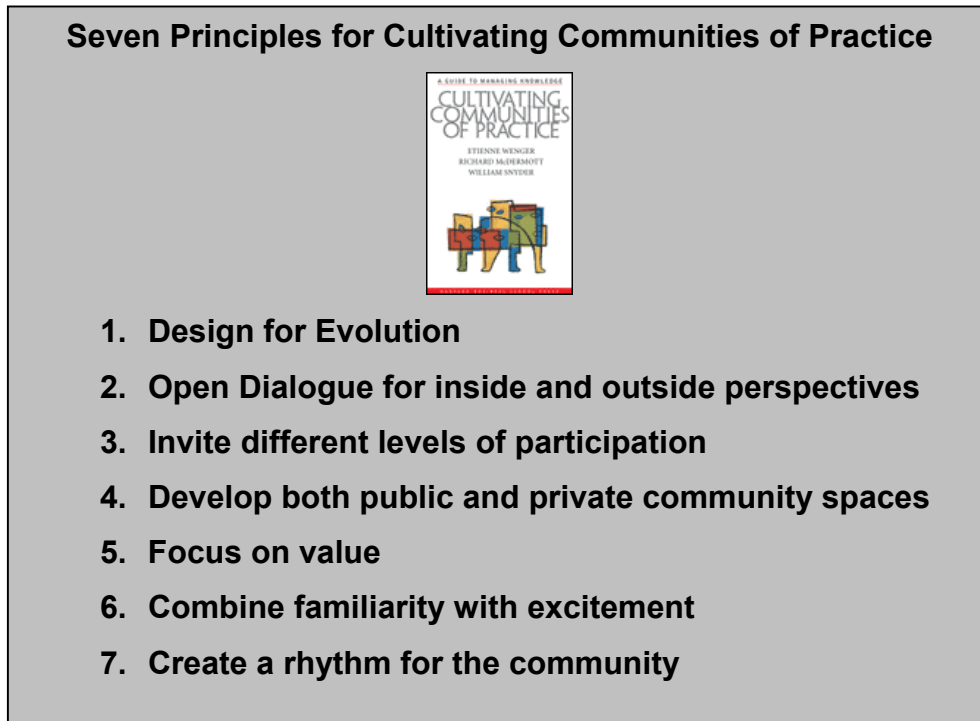


Figure 6 Seven Principles for Cultivating Communities of Practice. After “Cultivating Communities of Practice by Wenger, McDermott and Snyder, 2002

As part of this thesis, we built a prototype Community of Practice site on the Internet. This research has served as a guide in our design and implementation efforts. The next chapter discusses how we arrived at the present state. Drawing on what we have learned from collaborating with others who have grown successful Communities of Practice combined with what we have assimilated in our research, we will discuss the design that we believe will make a Navy Intelligence Community of Practice successful.

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V. IMPLEMENTING AN ONLINE NAVAL INTELLIGENCE OFFICER COMMUNITY OF PRACTICE

A. INTRODUCTION

Creating a successful online Community of Practice for a military intelligence organization presents several unique challenges. As described earlier, intelligence organizations have grown very reluctant to share information. Also, a number of security concerns must be addressed. Yet, without improving the ability to collaborate the community remains open to an unacceptable level of risk.

This chapter will focus on how to proceed with integrating a Community of Practice tool, specifically Simplify™ from Tomoye, into the Naval Intelligence community. Realizing that the military often seems reluctant to embrace any sort of change, e.g., a fundamental matter of women in combat or a simple issue as requiring everyone in the Army to wear the same beret, a very gradual approach is recommended. Our proposal calls for a three-phase implementation strategy. Phase I of the pilot program will focus on providing support to operationally deployed Naval intelligence Officers at the unclassified level. While benefiting those Officers, the main purpose of phase one is to expose the entire Naval intelligence community to the potential of an online collaboration environment. It will also give us, as the primary designers and administrators, a chance to try out different templates and procedures in a small and manageable environment.

Phase II will begin with the establishment of online collaborative environments on both the secret and top-secret networks. It may be necessary to divide this phase into two separate tracks, one for each of the networks. Phase III will look to expand the original unclassified community established during the pilot to include the entire Naval intelligence community, including Officers, enlisted personnel and civilians as well as other non-Navy organizations that are interested in joining. This third phase will also expand the scope of the unclassified community beyond just operationally deployed units to cover a wide

variety of topics facing our community. Phases two and three, as well as the potential for expansion to the entire USIC will be discussed in more detail in the final chapter of the thesis as a plan for the future.

The remainder of this chapter will provide a roadmap for community creation. Where applicable we will discuss the various stages of the development and why we chose specific options. The chapter is organized to serve as a blueprint for others who may be considering the establishment of their own online community as well.

B. WHERE WE ARE NOW

To understand our approach and recommended course of action we will first provide some background information how we arrived at our current stage of development. Our initial proposal for our thesis focused on the theoretical benefit that a Community of Practice could provide to Naval intelligence Officers around the world, with some discussion on how it could be applied further to the entire United States Intelligence community. The majority of the research was focused on examining Communities of Practice, both successes and failures, and identifying those aspects that would benefit a military intelligence organization. In the early stages of our research the head of information systems from the Office of Naval Intelligence (ONI) visited the Naval Postgraduate School to meet with all of the students in the Intelligence Information Management curriculum. Upon learning that our research involved studying the applicability of Communities of Practice for the intelligence community, he offered to sponsor us. However, he wanted to move past just a theoretical piece, and recommend we make specific plans to implement an online community. At that point, our research changed dramatically. No longer just considering the benefits of an online Community of Practice, we were now proceeding to evaluate the available CoP development tools and recommend the best software package to ONI. Realizing that the metrics for a successful Community of Practice in the military differ from that for an organization in the private sector we began studying extant Communities of Practice in the military. The fundamental difference between

Communities of Practice in government and those in the private sector is that in government there is no clear mechanism to measure the return on investment in a community of practice. During this phase we discovered the program management communities (www.pmcop.dau.mil) and CompanyCommand.com. (www.companycommand.com).

1. PM CoP

The main force behind the program management website was Mike Dorohovich, a retired Army Officer who was working as an independent contractor for the Army helping them develop communities practice. One of the first projects Dorohovich worked on involved the creation of an online Community of Practice for the program management community. He was faced with a challenge in that an overwhelming majority of the program management community was civilian of whom some 90% were going to retire before 2005. As they left, they would take with them their vast amount of experience and knowledge that served as the foundation for the program management community for the past twenty years. They believed the way to capture this knowledge for future use was through Communities of Practice. Dorohovich had been working with Communities of Practice for sometime and based on his own work and his group's evaluation of existing tools for Communities of Practice, they decided that a Canadian company, Tomoye, offered the best software tool to facilitate the community development.

Dorohovich's group and others pointed to Tomoye. A technology study by Etienne Wenger (See technology map in Appendix 1) identifies only Tomoye and one other company whose products squarely focused on the on-line infrastructure for building and maintaining Communities of Practice.

2. CompanyCommand.com.com

The similarities between the mission of the CompanyCommand.com.com team and our own goals made their model a very interesting one for us to follow. CompanyCommand.com's focuses on improving the quality of leadership at the

Army company commander level. More importantly, the CompanyCommand team developed a very successful online military Community of Practice. The website was designed to be an immediate attention getter. The CompanyCommand.com team relied on a professional appearance with high quality information within the site to help grow their community. What began as just a handful of junior officers now contains over 3,000 members. While the CompanyCommand.com site was instrumental to the success of their community, it proved a very labor-intensive process for the Webmaster. Almost all of the updates were performed by hand-coding actual HTML code. Some of the nicer features, the scrolling banners, a short list of the latest posts, the different surveys were created manually and the resulting displays created by hand. As CompanyCommand.com grew it became apparent that the CompanyCommand Team would not be able to sustain their website in its current form. They began searching for a commercial solution for their Community of Practice. Using some of Dorohovich's research and evaluation, and their own analysis process, they identified Tomoye's Simplify™ software as their best option. Tomoye's product contained all of the functionality that the CompanyCommand.com team needed and the added bonus of not charging a 'per seat' licensing fee. Most of the other commercial products charge a per seat fee for each registered user, which make them an economically prohibitive approach for most military communities.

Having talked with Mike Dorohovich and the CC team, Tomoye became our immediate frontrunner. To ensure that the recommendations and justification would also apply to the intelligence community, we arranged for the government account executive for Tomoye to travel to the Naval Postgraduate School and present their Simplify™ product. In conjunction with this visit, Tomoye established a temporary websites using the Simplify™ software and granted us access for demonstration purposes. After a brief training period, consisting of an hour-long conference call, we were able to create a virtual community space on Tomoye's temporary site. During the account executive's presentation, we learned that Tomoye was preparing to release its first major rewrite of the

Simplify™ product and migrate to a new enterprise Edition. This new addition would be priced on a per seat basis, just like the majority of the other commercial products. This per seat arrangement raised the potential for making the Tomoye product cost prohibitive for the Naval intelligence online community. We also learned that any organization that purchased the current Server Edition from Tomoye would be 'grandfathered' in under the current flat fee and would receive the upgrade to the Enterprise edition when it was released. Realizing that our thesis conclusion would be to recommend to ONI that the Naval intelligence community use Tomoye's Simplify™, and not wanting to incur the higher per seat fees, we contacted our sponsor. He concurred with our recommendation and arranged for ONI to purchase the Tomoye product and associated hardware. Suddenly we found ourselves with a Community of Practice software tool installed on a server with only some initial thoughts on how to get the community up and running.

C. HARDWARE

Our first hurdle actually required us to retrace a step. An issue emerged with running the tool on a single server. Seeing the potential for large potential number of concurrent users, three thousand under our current license and software configuration, a single server may become overloaded. A more optimized solution would necessitate installing a web server in front for user interaction and a database server behind from which the web server can pull the required data.

This configuration required us to wait until ONI could build and configure another server for our use. While only a minor setback, less than a week, it could have been avoided by stating the dual server configuration requirement up front. Servers outside of ONI's firewalls were needed as well. Due to the nature of ONI's work, their firewall limits the types of connections that can be made from the outside. Because of their security posture, setting up the servers behind the firewall would prove unreasonably difficult. Since the idea of a Community of Practice is built on information sharing, and Simplify™ incorporates some built-in

user management and security tools/capabilities/functions, we decided to locate the servers outside the firewall for maximum availability, currently in an area called the demilitarized zone (DMZ), allowing access from any internet-connected computer.

D. THE PILOT PROGRAM

While we have condensed a significant portion of the design process in this chapter, the bulk of the work required to create a successful online Community of Practice would take place during the pilot program. The success of any follow-on phase will depend on how well both the senior leadership and the junior Officers, who will form the overwhelming majority of the participants in the community, respond to the pilot. Unless it can be shown that the time that intelligence Officers are spending online provides a tangible benefit to these already time-strapped analysts, they will not return. It will also be necessary to pinpoint how these benefits extend to the individual's parent organization in order to gain command approval. Without demonstrating how the organization benefits, the leadership may be unwilling to allow its members to spend their valuable time sharing within the Community of Practice.

With so much riding on the success of the pilot, we have decided to rely heavily on the CompanyCommand.com model. After numerous e-mails, telephone conversations and a trip to West Point we hope not to make the same mistakes and not re-learn the same lessons that they have experienced over the past three years.

E. FORMING THE TEAM

Managing a successful Community of Practice, especially in its infancy, can prove somewhat labor intensive. Only a handful of people will realize the potential benefits of a Naval Intelligence Community of Practice right away. As such, it is difficult to find members willing to dedicate the time to moderate the various topics and provide most of the initial content. With most Communities of Practice, the vast majority of the content is provided by only a very small

percentage of the members. Until we develop an adequate membership pool, the community will not contain enough of these active participants to be self-sustaining. If left on its own, the data would become stale and the site irrelevant. To ensure that the initial site is engaging enough to generate repeat visitors and to develop the active recurring population we have recruited two other Officers to augment the core team. Again learning from CompanyCommand.com, we recruited an Officer with a very strong HTML background. While the Tomoye tool is very simple to set up and manage out of the box, customizing the display templates requires extensive HTML coding knowledge. As part of the enterprise edition expected later this summer, Tomoye has developed an interactive questionnaire/survey/quiz feature. CompanyCommand.com makes extensive use of surveys, questionnaires, and quizzes to generate and guide discussions. In the interim, this type of interactive feature requires a Webmaster with HTML and other web language coding skills. The other member of the core team is a fellow junior Officer, with prior enlisted experience as intelligence specialist, who recently completed a tour as the aide to Director of Naval Intelligence.

1. Target Audience

With the core team on board, it was time to identify our target audience. We started with a very narrow focus and audience, supporting the deployed Naval intelligence Officer. This group provides us Intelligence Officers that stand to gain significantly from an online Community of Practice. A majority of these Officers are working in their first tour. After only a few months of training at the Basic Intelligence Officer Course, these mostly junior Officers suddenly find themselves deployed with carrier battle groups and amphibious ready groups around the world. With no afloat experience, they are suddenly thrust into the position of providing timely intelligence to the Warfighter. Their inexperience coupled with insecurity can result in them not seeking assistance for even the simplest problems. By providing an online community where these Officers can ask questions outside of their peer group, we can provide an environment where

they will feel free to ask any question, no matter how trivial or simple it may seem.

The site may offer an opportunity to assist these new Officers in their professional development as well. Many will find themselves in leadership roles with two or three junior enlisted personnel working for them. Unlike their counterparts in the line communities, who rely heavily on their Chief Petty Officer during their first tour, many will not benefit from the counsel of a senior enlisted person. Navy1630.com will offer these Officers a chance to seek advice from the senior intelligence specialists and provide them the freedom to ask questions that they might otherwise be too embarrassed to ask in person.

2. Membership Drive

After identifying the target audience, the value of establishing membership in the community must be made apparent. As explained earlier, successful Communities of Practice reject the simple 'if you build it, they will come' premise. The community must be branded, publicized, and supported by the highest echelon within an organization and potential members courted. Just informing Naval intelligence Officers who are spread all over the globe that such an online community exists represents a challenge. Simply sending out a record message providing a URL for the site and mandating that all Naval intelligence Officers register at the website would seem a simple way to require usage, but that approach would undermine our long-term goal. As much as the military relies on orders, it would set the wrong tone. Communities that try to force participation routinely fail. We need to grow our community in a way that fosters long-term participation. Community members must develop a sense of belonging, almost a sense of obligation completely on their own. Our belief based on the experience by CompanyCommand.com and other Communities of Practice, indicates that the best way to create this type of devoted member is to rely on word of mouth to advertise the community's existence and benefits. A significant amount of time would be required if we relied solely on word of mouth to broadcast the message so we have identified fellow intelligence Officers to help. We laid out a map of

the world and identified Officers in each major concentration of Naval Intelligence Officers with whom we have worked; Officers who are also dedicated to improving our profession.

3. Topic Leads

In addition to serving as our first phase marketing team, we are also asking these individuals to serve as topic leads. Topic leads will pick their own set of topics to moderate. As moderators, their role includes monitoring discussion threads to ensure that all of the posts fall in line with our mission of improving intelligence Officers' ability to support the Warfighter. The bulk of their work will be directed to provide content during the initial start-up, as we expect the community to become mostly self-regulating. CompanyCommand.com as well as many other military communities have been surprised at how actively involved the individual members of the community become in guiding topic discussion and ensuring other members adhere to established netiquette. As members they do not want to see bad advice or manners being dispensed online and are quick to offer their opinions and views should they disagree with the nature or tenor of a post.

4. Joining the Community

Once our target audience is made aware of the existence of navy1630.com, we need them to join. It may seem a simple component to the development of the community but the details require careful consideration. CompanyCommand.com realized that unreasonable limitations on their members are extremely counterproductive to the community. Depending on the Officers' assignments, their target audience may only possess the time and resources to participate from home, which would prove difficult under the Army's proposed card reader configuration. Thus, the CompanyCommand.com team has avoided any limiting access controls to their community. Anonymous users, users who have not signed in or even created an account, can access almost the entire CompanyCommand.com website.

Unfortunately, we cannot adopt all of CompanyCommand.com's open access policies. While the pilot program will remain unclassified, some of the information posted within the navy1630 community may be of a sensitive nature. To restrict access to authorized users our community mandates users to login to the website using a user created account. Account creation is another procedure that requires us to differ from CompanyCommand.com. Their site is currently configured to allow anyone to create an account. A user simply visits the CompanyCommand.com website and clicks on *Create an Account*. This action launches a small online form in which the user supplies basic biographical data including an e-mail address. Upon completing this form, a username and corresponding password are sent to the e-mail account supplied by the user. Anyone who visits the site can therefore gain access, whether in the Army or not. Our community needs a slightly more restrictive policy for account creation. Using one of the options with the Tomoye tool, we have changed the *Create an Account* feature to *Request an Account*. The user still fills out the same biographical data form but upon completion, e-mail is generated and sent to the chief editor requesting an account. Currently the only criterion for account creation requires that the requestor be able to provide a .mil e-mail address for receipt of their login name and password. After the initial setup, the user may then change their registered e-mail address to any account they desire. Our policies may not be as open as the CompanyCommand.com policies, but after the initial account registration, our users will also be able to participate from any Internet connected computer.

5. No Command Logos

Another lesson that the CompanyCommand.com team learned was that regardless of what organization actually hosts the website, no attempt should be made for an organization to take 'ownership' of the community. For example CompanyCommand.com website is currently being hosted on servers at the US Military Academy at West Point. Officials at West Point originally wanted to place an academy logo somewhere on the website's homepage. The

CompanyCommand.com team explained that this association would prove very counterproductive to their mission. Whether deserved or not, every organization and institution brings associated 'baggage' (e.g., peoples impression of the organization), some good and some bad. To insure the widest possible membership the site must be kept free of any negative stigma brought by association of the site with any given organization. CompanyCommand.com solved the problem by designing their own logo and giving the community its own identity. They also registered the CompanyCommand.com website in the '.com' domain, which allowed them to at least give the appearance that Department of the Army was not even involved. This configuration allows members to share more freely and without fear of reprisal. While this practice cannot be adopted on the classified networks, we will utilize a '.com' URL during the pilot program. After receiving confirmation that ONI would purchase and host the Simplify™ tool, we registered 'Navy1630' in the '.com' domain; 1630 is the designator for Naval intelligence Officers. We are also registering 'Navy1630.navy.mil' with The Defense Information Systems Agency (DISA). At first, we considered incorporating 'intelligence' or 'intel' into the site title but realized that we may draw unnecessary attention to ourselves. The server itself remains within the .mil network, but the Tomoye tool allows us to control what website is displayed on the user's navigation bar within the browser.

6. Anonymous Posts

One of the biggest concerns voiced about our proposal is that the community would degenerate into a free-for-all or name calling session. To ensure that certain standards of decorum are maintained we have restricted users' ability to post documents or messages anonymously. Users may submit an item for anonymous posting but the editor for that individual topic must first approve the proposed post. The editor can either approve the anonymous post or reject it. Rejection requires the editor to provide feedback to the requestor.

7. The Content

After spending considerable time and effort setting up the mechanics of the community site we have begun to focus on the actual content of the website. Presently, we have identified four top-level topics – *On the horizon*, *Operations*, *Detailing*, and *The Cruise Box*. While we envision eventually expanding this number, especially during the later phases of the implementation, we are limiting ourselves to topics that will pertain directly to our target audience during the pilot phase. Additionally only a few subdivisions will be initially permitted under each of the top-level topics. As the community grows, it will be necessary to subdivide each of the topics further to maintain order. During the initial startup, however, we wanted to populate all topic areas with content. In addition, while we may propose where the subdivisions should occur we will use the first few months of the pilot program to monitor the various discussion threads and identify those topics that warrant their own defined areas.

The most labor intensive of the top-level topics, “*On the horizon...*” will also provide our biggest draw for new members. This section will change each month and allow us to spotlight a particular subject of current interest to the Naval intelligence community. For example, should the United States find itself supporting another major United Nations peacekeeping operation, we would feature ‘intelligence support to peacekeeping operations’ that month. The main page would include a survey or questionnaire related to peacekeeping to serve as initial attention getter. We would post interviews with senior members who have previously been involved in similar operations as well as related publications and doctrine. A fictional scenario would be posted that would challenge the members with a corresponding quiz designed to highlight some of the more difficult aspects of providing intelligence support to peacekeeping operations. After completing the quiz, the member would be able to see how their answers compared to other members of the community and participate in various discussion threads. “*On the horizon*” offers the new member a simple way to begin to interact with the community. The quizzes and the surveys will be specifically designed to provoke thought and to generate vibrant conversation

about the various topics. We will specifically be looking for situations where the formally approved doctrine differs from what is actually happening in the field.

CompanyCommand.com takes advantage of their location at West Point to interview various officials that are brought in to speak to the Corps of Cadets. These individuals can range from the Chief of Staff of the Army, General Shinsheki to the U.S. commander in Iraq, General Tommy Franks. The CompanyCommand.com team records the interview with a digital video camera and the edits the interview into one or two minute video clips and posts them to their website. For example, one of their recent clips featured the task force commander during Operation Anaconda in Afghanistan discussing how to lead troops during combat. This type of content gives their community members a chance to learn from individuals whom they would never meet otherwise.

We can extend this practice to returning battle groups to generate additional Horizon topics. As the battle group intelligence Officers return and provide their debriefs we can encourage them to post what they believe helped them most during their cruise. They will be able to highlight what worked and what did not and ways to improve the process. We essentially will be able to take the formal, and arguably antiquated 'lessons learned' process, and turn it into a value-added process. Those preparing to deploy will be able to request additional information related to a particular report and receive feedback from those that were actually there.

8. Other Content Areas

In addition to "*On the horizon*," the second top-level topic, *Operations*, focuses on the direct support of operationally deployed Intelligence Officers. This section is further subdivided into each of the different types of operational tours, carrier battle group, amphibious ready group, patrol and reconnaissance squadrons, and Special Operations Forces (SOF). These subtopics will serve as 'one stop shop' for all of the unclassified information needed for a successful deployment. Everything from ship and aircraft recognition guides to recommendations for the best hotel for a squadron admin in Sydney will be

posted here. Deployed or soon to deploy Officers can use the discussion threads to solicit advice from those who have recently returned. Problems that arose during a particular deployment that may not have reached the reporting threshold of the formal lessons learned process would now be shared between battle groups.

The third top-level topic is *Detailing*, which pertains to the entire Naval intelligence community, especially the junior Officers. While outside the scope of our initially defined target audience the decision was made to include a section devoted to the detailing process. Negotiating one's next assignment makes up one of most important aspects of an intelligence Officer's career. With so many jobs spread across the entire globe, Officers are sometimes very limited in their knowledge of what assignments actually entail. Whether it's as simple as how long is the typical work day for a particular assignment to soliciting advice about the quality of the local school systems, there always seem to be more questions than answers. Transfers also exert a significant stress on the entire Officer's family. An official sponsor program is already in place to try to assist transferring members, but the amount of support can vary widely. By leveraging the advantages associated with a Community of Practice for collaboration and information sharing, we hope to provide a higher level of support and lower the amount of frustration associated with choosing and transferring to a new assignment. For community development purposes, *Detailing*, just like the *On the horizon* and *Operations*, offers us a chance to increase the number of initial members.

The fourth top-level topic is *The Cruise Box*. In the Navy, deploying squadrons and air wings utilize cruise boxes to transfer all of their equipment from their commands ashore to the aircraft carrier. Absolutely everything they can possibly need during a six-month deployment, ranging from personal side arms to maps and aeronautical charts are crammed into cruise boxes and transferred to the ship. In the Navy1630.com website *The Cruise Box* looks much like the library at other sites and will serve in much the same manner as actual boxes; providing a centralized area for any of the various information

resources that an intelligence officer may require. Some of the types of information available here will be unclassified briefing templates (i.e., for cyclic operations briefings), examples for any number of reports that are written while underway, e.g, awards, and even port visit information. The reader who has not deployed may ask “why?” When the carrier deploys, the different units onboard rely on their intelligence officers not only for intelligence support, but when pulling into ports for a visit, they are called upon to provide timely information for the pending port visit. This information usually includes the best locations for an admin (central location for the squadron to base their ashore social activities from), security precautions, places to see, and things to do while there.

F. ADDITIONAL FEATURES

We have identified several features that would improve our community and submitted them to Tomoye for consideration. Two of the most beneficial components include a personnel skill set database with an extensive search capability and a *Peek'* feature. The skill set database would require initial data collection from each community member during the account creation. To minimize the impact on the individual members we would recommend accessing the Bureau of Naval Personnel (BUPERS) databases to import readily available data, including previous assignments, language skills, and any special school or qualifications. Users would then only need to enter any experiences or skills they have added which has not already been captured in their service record. For example, an intelligence Officer may have spent a year abroad as part of their undergraduate studies, or perhaps they traveled to a little known country as part of church trip. Currently these types of experiences are not recorded and thus impossible to identify unless volunteered during a crisis. Even the basic skills, such as language proficiency, are not easily searched or cross-referenced. If a crisis erupted in a developing nation, where the inhabitants spoke a very rare language, it would take days to assemble an intelligence support team with the required skills and experiences. Under the current system, an Intelligence Officer who spent a considerable amount of time within the country of concern

possibly would be completely overlooked for the mission for the simple fact the Officer was not currently stationed in theater. By incorporating a skill set database as part of the Community of Practice, senior leadership could access a list of qualified candidates and their current locations. Accessing BUPERS data raises questions of security of information, but as the community grows, these and other ideas and opportunities require further consideration.

The second recommendation calls for a *Peek* feature. We envision this capability as a tool for senior leadership to gain some insight into the junior officer community. Several areas will be restricted to junior Officers only. These areas are specifically designed to allow junior Officers to ask questions or voice concerns without fear of reprisal. In a very similar manner to the omission of command logos as part of the community, establishing a junior Officer area allows these young Officers to develop their own strong sense of community. However, the senior leaders may desire to see what junior officers rank as hot issues. The *Peek* feature would allow selected senior leaders to view the posts within the junior officer areas but the names of the posters, and any names that appear in posts, cross referenced against the member database, will be removed.

G. SUMMARY

As illustrated in this chapter even the smallest details regarding site construction, content population, and membership solicitation require careful consideration during the creation of an online Community of Practice. Making the wrong decision can discourage user membership and participation and ultimately lead to the failure of the community. With very little room for error during the pilot phase, we have relied heavily on the best practices from other military Communities of Practice. However, these models can only take us so far. Once the community officially opens for business, we will be faced with an entirely new set of challenges. As the community begins to grow, situations unique to our community will arise and we will not be able to rely on the experience of others to direct our course of action. During this process, we can

take one more important lesson from the CompanyCommand.com team, i.e., remain focused on the mission. As a matter of procedure the CompanyCommand.com team begins their regular meetings with one member reading their mission statement. As CompanyCommand.com.com has evolved, situations have caused the team to get off track and they found themselves on tangents that not in line with their mission. As we are faced with our own unique situations, it will be important to keep our mission as the primary focus. We realize that we will make mistakes but believe that we have set a strong foundation for our Community of Practice that will allow us the flexibility to correct our errors, learn from them and move on. The greatest asset we gain through this whole process is a population in the Naval intelligence community that wants to improve our profession and realizes a need to improve our analytical capability.

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VI. CONCLUSION AND RECOMMENDATIONS FOR THE SUCCESSFUL IMPLEMENTATION OF AN ONLINE NAVAL INTELLIGENCE OFFICER COMMUNITY OF PRACTICE

We have accomplished most of our goals and exceeded our original expectations for this thesis. What began as a theoretical piece with the hope of identifying the potential benefits from establishing a Community of Practice for the Naval Intelligence Officer community has progressed rapidly to the implementation phase. We have created an interactive, but up to this point empty, knowledge library called *The Cruise Box*. Additionally, *Navy1630.com* comes complete with an 'Officer's club', the discussion threads for vibrant interactions and lively debates about issues facing our community, a 'theater', the '*On the horizon*' section to spotlight the hot topics and provide immediate feedback to the community, a chief's mess to help mentor our newest Officers and help them become better leaders and the flexibility and potential for uses we have not considered yet.

A. THE WAY AHEAD

Our goal with the pilot program is to reach the 'tipping point' [Gladwell, 2003] as soon as possible. The tipping point for a Community of Practice occurs when enough members and active participants make the community self-sustaining. Overall guidance and organization of the site will always be needed but once the tipping point is reached, we will be able to dedicate our efforts to addressing the second and third phases of the implementation process.

B. BRANDING/ADVERTISING

During the next few months, critical steps will be taken to increase the awareness of the website's existence among as many Naval Intelligence Officers as possible. Our approach of utilizing our fellow junior Officers offers a low cost technique to gain an initial membership base. However to increase the probability of success and reach the tipping point as soon as possible we need to implement a dedicated advertising and marketing plan.

Senior members of military, who are used to giving orders and expecting them to be carried out, may not initially see the value in advertising and marketing. As Companycommand.com realized, this type of mandated approach can be very counterproductive. Members must join voluntarily to begin to foster the sense of community vital to its success. We propose that arrangements be made with our next commands to allow both of us to travel to the major Naval intelligence concentrations. The most effective way involves us visiting various sites in conjunction with the detailers. While Naval intelligence Officers may not attend a briefing solely about *Navy1630.com*, they will show up in force to hear the latest from the detailer. In addition, an overview of the online community needs to be incorporated to cover those commands and areas that we cannot visit in person. Additionally, a funding line should be established to help support the marketing effort. As intelligence Officers we make our living giving briefs, and while we will be able to present a convincing case as to why our fellow intelligence Officers should join and participate in *Navy1630.com* we can be even more effective with a few marketing items. We will design t-shirts, hats, and coffee mugs featuring the *Navy1630.com* logo. As we travel to various commands, we will distribute these items. Again taking a cue from CompanyCommand.com's experience, these simple items help foster the sense of community. When a member sits down in front of a home computer with a cup of coffee in one of our mugs it helps instill a sense of ownership, which might result in a more active participant.

C. PHASE II

Phase II represents the most important aspect of our entire effort, improving the analytical ability of Naval intelligence Officers and establishing a new collaboration model for the entire intelligence community. Three major issues are associated with establishing a Community of Practice on the classified networks: accreditation, membership, and the most challenging, changing the culture of the analytical community to accept collaboration readily.

Every piece of software that is installed on either the secret or top-secret classified networks must undergo an accreditation process. Due to the nature of the information residing on these networks the software must be evaluated for any type of vulnerability it may introduce. While Tomoye's server edition is currently being used in the pilot phase, the accreditation step should be delayed until the release of the new *Enterprise Edition*. Otherwise, due to the complete rewrite of the source code in the new edition, the entire process would be repeated. Initial arrangements are being made for ONI to assist Tomoye during the accreditation process starting as soon as the *Enterprise Edition* is available. A related issue may arise due to the fact that Tomoye is a Canadian company and some of the networks involved are limited to only U.S. citizens. Tomoye is aware of the need to incorporate U.S. citizens with the appropriate clearance into their U.S. offices. This requirement was already identified by the Army when they decided to purchase 1.2 millions seats for the Army wide Community of Practice effort.

Just as with our pilot phase, gaining initial membership and making people aware of the existence of community on the classified networks will require a dedicated effort. Setting the pilot program up and running will greatly aid us in advertising the new community established during phase II. With the focus of phase two being to increase collaboration and thereby improving the analytical capability of intelligence Officers, we should attend the various theater intelligence conferences. As described earlier in chapter two the intelligence community has recognized the need to increase collaboration and holds annual meeting to discuss some of the high priority intelligence requirements. At these meetings, we will advertise the online community spaces as a natural extension of the collaboration effort from the conferences.

Changing the culture presents the biggest hurdle. Unfortunately, the road map to cultural change has not been crafted yet. Some analysts will never adapt to this type of virtual collaboration. However, a significant portion will. The focus of this change effort will attempt to ensure that community

membership and participation provides a rewarding experience for both the individuals and their organizations.

D. PHASE III

Phase III, the expansion of *Navy1630.com* to include the enlisted members of the Naval intelligence community should be the easiest of our three phases. Just as *Companycommand.com* spawned *PlatoonLeader.org*, given enough time the *Navy1630.com* expansion would most likely occur naturally. However, delayed development and implementation may cost valuable time and result in missed opportunities. To help create a strong sense of community among the enlisted intelligence specialists, a separate Community of Practice should be established. Our suggestion is that ONI registers the 'NavyIS.com' domain name as soon as possible in order to secure this URL for future use. The site itself should be hosted on the same server as *Navy1630.com*, a technically feasible solution with the release of the new *Enterprise Edition* from Tomoye. Dual hosting will allow us to cross-reference topics that both the Officer and enlisted community share in common. It will also facilitate an *Ask a Chief* section in *Navy1630.com*, allowing those senior enlisted personnel involved to login into one site to participate in both.

In conjunction with the expansion to include the intelligence specialists, we recommend that a central support office be created to continue to facilitate and improve the communities on both the unclassified and classified networks. Ideally, the office should be staffed by two or three permanent parties to ensure continuity. One of the members needs to serve as the technical expert and possess a solid HTML background. The new *Enterprise Edition* promises to simplify the template modification process to a simple drag and drop procedure but the HTML skills will still be required for development of more advanced features.

E. FUTURE

While it would be valuable to include the expansion of *Navy1630.com* concept to the rest of the USIC, it is well beyond our scope. Naval Intelligence represents only one of fourteen of the agencies that comprise the USIC's bureaucracy. Such an organization may not be ready for the anticipated let alone unknown changes that might occur. However, *Navy1630.com* can serve as the model for the rest of the USIC. As we implement phase II and transition to the classified networks, analysts from other services and agencies will be exposed to the Naval intelligence communities. We believe that once exposed, these non-Navy analysts will realize the value of such a community and want to become members. In turn, we envision a 'grass roots' movement where the junior analysts, who culturally appear more open to change and quicker to embrace new technologies, demand access to what will then form the U.S. Intelligence Community of Practice.

F. FINAL THOUGHTS

The Tomoye tool helps create an environment that fosters community development, but it remains only a tool. The success of every Community of Practice depends on its members. The Naval intelligence community consists of individuals who are dedicated to serving their country to the best of their ability. Many times these individuals can become frustrated due to the limitations of current systems and realities associated with being intelligence analysts. The attacks on 9/11 should serve as a wake up call to the limitations of operating in a fragmented manner and cause us to be more critical of our current practices and procedures for intelligence gathering and decision-making. The USIC looms so large and our ability to collect information so great, that information dispersion is inevitable and unavoidable. Coupled with the analytical dispersion resulting from the ever-increasing mission and potential threats to the United States, the USIC continues to operate at an unacceptable risk level. Establishing a Community of Practice will allow us to address some of the most pressing issues by improving our analytical capabilities and increasing collaboration among the various

analysts throughout the world. The bottom line is that the members of the Naval intelligence community bring extraordinary passion to the work of improving the way we do business. A Community of Practice can provide an extremely powerful tool to facilitate our transformation.

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APPENDIX I

**NAVSEA
COMMUNITY OF PRACTICE
PRACTITIONER'S GUIDE**

VERSION 1.0a

MAY 2001

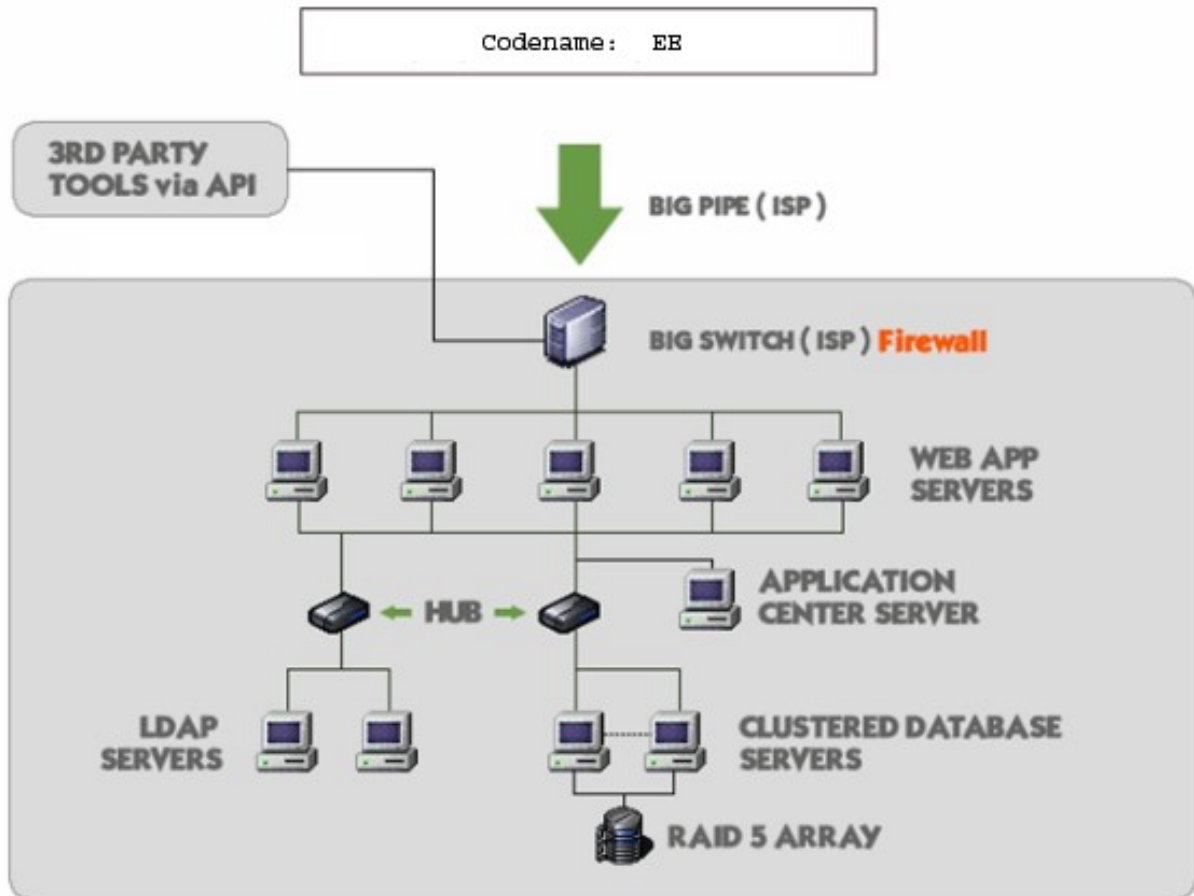
The Community of Practice Practitioner's Guide is designed as a tool for establishing and sustaining communities of practice. The focus of the guide is to provide a "how to" approach rather than a "what is" approach. Comments or suggestions on the guide are encouraged. The point of contact for this document is Jill Garcia, SEA 00I, garciajd@navsea.navy.mil, 202.781.3012.

The remainder of this document can be downloaded from the following URL

[http://www.km.gov/documents/DoN CoP Practitioner's Guide ver 1.doc](http://www.km.gov/documents/DoN_CoP_Practitioner's_Guide_ver_1.doc)

APPENDIX II

Recommended Tomoye Server Architecture

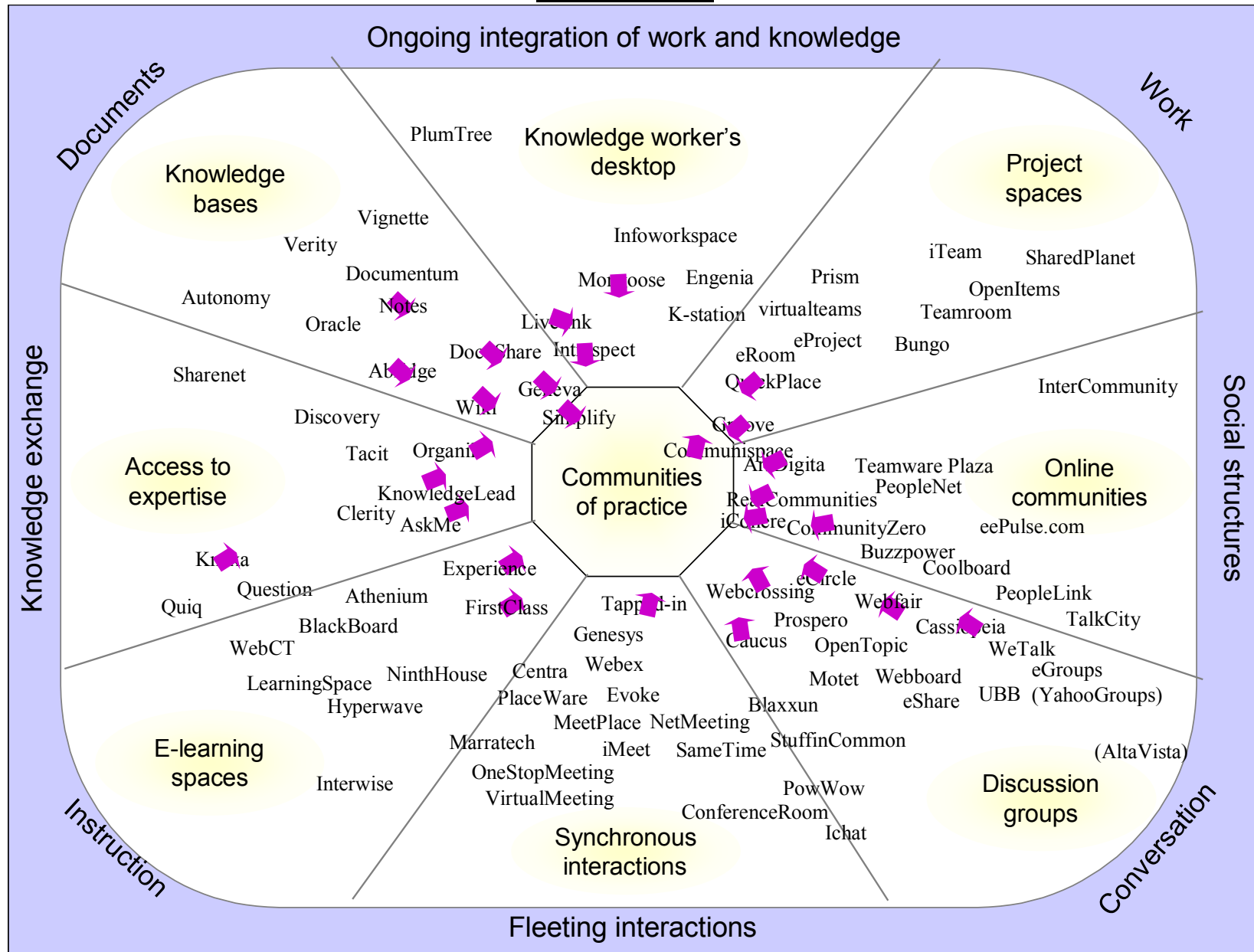


Platform: Win2k PRO , SQL Server/Oracle , IIS , .NET , App Center

Architecture: .NET XML API's , LDAP , PKI , Firewall Secure , NTLB

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APPENDIX III



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