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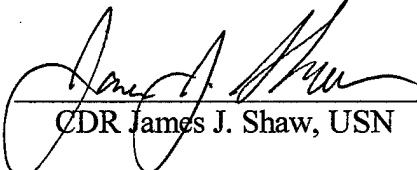
**ORGANIZING FOR NETWORK CENTRIC WARFARE:  
CREATING AND EMPOWERING CHIEF INFORMATION OFFICERS  
WITHIN THE COMBATANT COMMANDS**

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature:   
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16 May 2000

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## REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): Organizing for Network Centric Warfare: Creating and Empowering Chief Information Officers within the Combatant Commands (U)			
9. Personal Authors: Shaw, James John, CDR USN			
10. Type of Report: FINAL		11. Date of Report: 16 May 2000	
12. Page Count: 21		12A Paper Advisor (if any): CAPT D.S. Thompson, USN	
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Chief Information Officer, CIO, Network Centric Warfare, NCW, Year 2000, Y2K, organization, information infrastructure, infostructure, interoperable, systems, combatant commands			
15. Abstract: Creating and empowering Chief Information Officers (CIO) within the Combatant Commands and Joint Task Forces will create organizational structures that will facilitate the alignment of information technology and warfighting processes and enhance the commander's speed of command. Bringing the Command CIOs together with their counterparts on OSD (C3I), the Joint Staff, services and agencies for CIO Council tradespace discussions will accelerate decision cycles for joint, interoperable system acquisition. The organizational, technical, and cultural evolution will facilitate the transformation to Network Centric Warfare concepts.			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Security Classification of This Page Unclassified

## **Abstract**

Creating and empowering Chief Information Officers within the Combatant Commands and Joint Task Forces will create organizational structures that will facilitate the alignment of information technology and warfighting processes and enhance the commander's speed of command. Bringing the Command CIOs together with their counterparts on OSD (C3I), the Joint Staff, services and agencies for CIO Council tradespace discussions will accelerate decision cycles for joint, interoperable system acquisition. The organizational, technical and cultural evolution will facilitate the transformation to Network Centric Warfare concepts.

## **Introduction**

The number one recommendation from the Joint Staff and Combatant Command Year 2000 (Y2K) Task Forces, after a three day post-Y2K Lessons Learned Conference, was to create and empower Chief Information Officers (CIO) within the Joint Staff and Combatant Commands.<sup>1</sup> The Joint Staff and Combatant Command Y2K Task Forces, fulfilling the temporary role of CIOs, were very successful in resolving a complex infrastructure problem in a shorter time than previous organizational structures would have allowed. The Y2K Task Forces integrated requirements, acquisition and technology communities across service and functional lines, and consequently shortened decision cycles.

Current information infrastructures (infostructures) are still not fully interoperable and do not fully meet the needs of the joint warfighter. The current requirements and acquisition process (Joint Operation Planning and Execution System (JOPES)) may require years to solve these complex problems.<sup>2</sup> However, the Y2K Task Forces accomplished great progress towards system remediation and interoperability as well as configuration management. It was the collective belief of the Y2K Task Forces, that the tremendous amount of work they accomplished in 18 months and the great progress towards interoperability should be continued to solve remaining infostructure problems. The Y2K Task Forces recommended formalizing the Command CIO organization to facilitate further progress.

Transforming from the current infostructure to one based on the tenets of Network Centric Warfare will require a commensurate level of effort and cultural change as the Y2K effort to succeed. During recent remarks at the Olin Institute for Strategic Studies

in Cambridge, Massachusetts, Admiral Harold W. Gehman, Joint Forces Command, stated that "transformation is not just about the applications of information age technologies -- it is every bit as dependent on new organization structures, new operational concepts and improving joint teamwork."<sup>3</sup> Creating and empowering Chief Information Officers (CIO) within the Joint Staff, Combatant Commands, and the Joint Task Forces (JTF), will facilitate the transformation to an interoperable and more responsive infostructure.

In industry, companies are aligning information technology and business processes to gain greater efficiency, which translates into greater revenue. Government agencies are also moving towards greater integration of information technology and business processes, gaining greater efficiency and customer satisfaction. Recommend the Joint Staff, Combatant Commands and Joint Task Forces begin to align information technology and warfighting processes to gain greater efficiencies in warfighting capabilities through the offices of a Chief Information Officer.

### **Year 2000 (Y2K) Lessons Learned and Recommendations**

During the Joint Staff Year 2000 Task Force Lessons Learned Brief to Deputy Secretary of Defense, Dr. Hamre, on 9 February 2000, Joint Staff Y2K Task Force Commander, RADM Robert F. Willard, USN, discussed the following:<sup>4</sup>

“Lesson:

JS / CINC CIO roles, responsibilities and implementations are inconsistent.

Way Ahead:

Establish CIO at Joint Staff and CINCs

Charge IAW Clinger Cohen Act

Responsible for cross functional view

Champion: CJCS/CINCs

Target Date: 90 Days”

During the Y2K effort, the Joint Staff and Combatant Command Y2K Task Forces had effectively become the command's CIOs since no formally designated entity previously existed. After the successful Y2K effort, the Joint Staff and Combatant Command Y2K Task Forces recommended normalizing department, service and agency CIO roles, responsibilities and implementation, and establishing CIOs at the Joint Staff and the Combatant Commands under common policy, guidelines and organization. As was accomplished for the Y2K effort, creating and empowering CIOs within the commands will facilitate bringing together communities of interest to solve common infostructure problems. The synergy of effort demonstrated during the successful Y2K effort resulted in solving infostructure problems in a relatively short time.

The Office of Secretary of Defense, Command and Control, Computers and Intelligence (OSD (C3I)) Year 2000 Office and the Joint Staff Y2K Task Force directed the Agency and Command Y2K Task Forces to review core warfighting processes from a broad functional perspective vice a narrow technical systems perspective. Industry efforts had indicated that focusing on core business processes was a more successful strategy than focusing on systems. By focusing on core warfighting functions, commands were able to identify, prioritize, and test all mission critical systems at least twice prior to the New Year's rollover, thus ensuring the continuity of mission critical

operations. The OSD (C3I) Y2K Office, and the Joint Staff Y2K Task Force, acting as the Joint Staff CIO, set the guidance and direction for command, service, and agency Y2K testing efforts. The Command Y2K Task Forces, acting as the Command CIOs, identified critical warfighting functions and the mission critical systems supporting those functions. They coordinated the command's operational testing of those systems with the Joint Staff, services and agencies. The Command Y2K Task Forces, acting as the Command CIOs, provided the focal point for these efforts and facilitated successful resolution of the Y2K problem.

The Department of Defense's cultural reaction to the Y2K problem offers some insight into the transformation to concepts such as Network Centric Warfare. Initially, the Y2K problem was viewed as a technical systems problem; however, that perspective changed to an operational focus. Industry experienced the same cultural reaction to Y2K as occurred in the Department of Defense. "When it (Y2K) first started, it was a data-processing problem. As it evolved, it became a customer communication problem, a vendor problem, a business risk assessment problem and an internal communications problem. It was a true enterprise effort," according to Rich Alden, a vice president at First Union Bank in Charlotte, N.C.<sup>5</sup> In both the Department of Defense and industry, reaction to the Y2K problem evolved from a narrow, technical, systems perspective to a broad, cross-functional, enterprise perspective. Further, the transformation to concepts such as Network Centric Warfare will probably experience the same evolution.

## **Network Centric Warfare (NCW) Infostructure**

In their book Network Centric Warfare, Developing and Leveraging Information Superiority, authors David Alberts, John Garstka and Fred Stein state that "the entry fee for Network Centric Warfare is an infostructure that provides all elements of the warfighting enterprise with access to high-quality information services."<sup>6</sup> The entry fee for creating a Network Centric Warfare infostructure is an empowered CIO who can align information technology and warfighting for the commander. "Infostructure systems will provide key capabilities (bandwidth, processing power, stored information, decision aids, and agents) and need to be better designed to support battlespace entities as they interact much more closely than ever before. The increased use of decision aids and battlespace agents will make it more important for the systems to be thoroughly tested before deployment. Just like organizations, their job is to enable and facilitate, not to get in the way. Legacy systems, designed as stovepipes optimized for one way of doing business, will need to give way to systems that are optimized to share and exchange information (with appropriate security). Individual systems will no longer be effective unless they can contribute value as part of a larger federation of systems that constitute the infostructure."<sup>7</sup> Chief Information Officers' goals should include working towards a more joint interoperable infostructure. The result will be the interoperability of common hardware and software and the migration or consolidation towards fewer functional systems, resulting in more efficient warfighting processes.

## **Combatant Command Commander in Chief (CINC) and CIO relationship**

The Combatant Command Commander in Chief (CINC), and the Commander Joint Task Force (CJTF) must have a strategic relationship with their Command CIOs. In industry, the relationship between the CEO and CIO is becoming closer and more important to the alignment of information technology and business. For example, the Marriott International Inc. hotel chain spent three years bringing both sides together with positive results. "Three years ago, Marriott's president and chief operating officer, William Shaw, recognized the need for more strategic IT-business alignment and acted. He hired a senior vice president of planning for Information Resources (IR) and invited the CIO into the boardroom."

"Today, the business dictates every technology decision, and IR is part of the process. Thus, by erasing the lines between business and IT, Marriott has embraced what analysts say will be the key to maintaining a competitive edge in the 21<sup>st</sup> Century."

"If I don't have a strategic relationship with my business partners to identify problems and opportunities to leverage information technology, then I'm bleeding critical lifeblood out of the company,' says Jerry Luftman, executive director for the graduate information systems programs at Stevens Institute of Technology in Hoboken, N.J."

"If your IT organization isn't represented in the boardroom like it is at Marriott, it's probably because you're not walking the business walk and talking the business talk of value, revenue and process. But by following basic stepping-stones – getting to know your business, communicating a business message and participating in planning meetings – you can bridge that gap."<sup>8</sup>

In government, the relationship between the CEO and CIO has not evolved as far their industry counterparts; however, the government CEO and CIO relationship is migrating towards the industry model. "Unlike their private-sector counterparts, federal CIOs often lack access to top management and may be treated primarily as technical support managers. It's a disparity that's worrying some federal officials, especially as information technology projects and good information security practices become increasingly critical to an agency's success.... Private-sector CIOs can work directly with the CEOs to make immediate decisions...CIOs need to be recognized by top executives in order to be effective."<sup>9</sup> A recent industry survey indicated "that 15 percent of new CIOs now serve on the boards of their companies and 70 percent are on their companies' high-level management teams. Those numbers are up sharply from a decade ago, industry specialists say, when 0 percent and 10 percent would have been more likely figures."<sup>10</sup>

As information technology is becoming increasingly embedded in all warfighting functions, then the alignment of information technology and warfighting becomes more critical. The importance of information technology and business processes in corporations has brought new organizational structures. "An increasing number of chief information officers...are amassing greater power as top bosses, and company boards realize how crucial technical expertise is in staying ahead of the competition."<sup>11</sup> Mr. Eugene DeCroux, from A Web Technologist Corporation, describes the trends. "With technology evolving faster than most CEOs can comprehend, it has become an absolute necessity for company leaders to elevate CIOs to par positions or run the risk of losing both the CIO and market share to the competition."<sup>12</sup> The application of industry's

lessons learned to warfighting includes elevating the CIO to the Commander's staff and creating a special relationship between the Commander and the CIO to implement successful infostructure implementation.

The Command CIO must have a cross-functional perspective to support the entire warfighting mission and should avoid functional advocacy. In commercial organizations, CIO responsibilities cross many business lines, and CIOs "spend at least half their time outside the information-technology department on efforts like developing and incubating new prospects for electronic commerce."<sup>13</sup> Similarly, the Command CIO should be horizontally, vice vertically, integrated with the functional command staffs to develop and further new warfighting concepts.

In industry, companies have created special relationships between the CEO and CIO to facilitate the organization's alignment of information technology and business processes. Government agencies are just now beginning to establish those special relationships between the agency's CEO and CIO. Recommend the Commander place the CIO on his special staff to closely align information technology and warfighting processes.

### **Information Technology and Cultural Evolution**

The Y2K Task Forces learned to overcome cultural differences between information technologists and warfighters by "operationalizing" the approach to Y2K remediation. They became partners with the command warfighting elements, by first examining warfighting processes, thereby gaining credibility, and then by reviewing mission critical systems' status. Command CIOs should continue this approach to bridge

the cultural divide between information technology and command leadership. The Y2K Task Forces overcame misperceptions of the effects of Y2K on warfighting and business processes by analyzing, and actively educating and discussing the issues with the command leadership. Additionally, the Y2K Task Forces fostered greater credibility and trust among leaders and the command elements through complete disclosure of the problems and solutions and associated timelines for repair.

The nature of the CIO has evolved. According to Mr. Lochow, Tech Data CIO, "We're in the third generation of CIO now. The first generation was made up of techies, like data center directors. And although the second generation was more vocal in terms of becoming part of corporate planning, its members were still one level below directly reporting to their chief executives. Now, however, thanks to the Internet, CIOs are moving into corporate decision-making." In a recent article, The New York Times states, "Executive recruiters say the trend is the inevitable fallout of the Internet revolution, which has recast the dynamics of the marketplace of almost every industry overnight and forced companies to react with equal speed or face extinction. 'It used to be that companies would say, 'Find us a CIO who will take care of our computer systems,' says S. Ross Brown, the director of the high-technology and telecommunications recruiting practice at Egon Zehnder. 'But now they're calling to say, 'We need a CIO who can help us define our whole way of doing business.'" Those new responsibilities require new duties, of course, including spending more time with both the corporate brass and customers."<sup>14</sup>

## **Foundation for CIO Success:<sup>15</sup>**

According to the Government Accounting Office (GAO), there are six principles of CIO management in leading organizations:

1. Recognize the role of information management in creating value.
2. Position the CIO for success.
3. Ensure the credibility of the information management organization.
4. Measure success and demonstrate results.
5. Organize information management to meet business needs.
6. Develop information management human capital.

## **Combatant Command and Joint Task Force CIO Roles and Responsibilities**

The Combatant Command and Joint Task Force CIO roles and responsibilities should include the following:

1. Senior Information Technology Advisor. Provide advice to the commander and other senior management personnel of the command to ensure that information technology is acquired and information resources are managed in a manner that enhances warfighting capabilities and business processes. Establish and equip the commander with the necessary infostructure strategy needed for warfighting. The end-result should be increasing the commander's speed of command.
2. Information Technology Architect. Develop, maintain, and facilitate the implementation of a sound and integrated infostructure for the Combatant Command,

Joint Task Force and subordinate commands across command, service and agency programs. Identify command-wide information technology priorities.

3. Information Resources Manager. Promote the effective and efficient design and operation of all information resources management processes for the command, including improvements to warfighting and business processes of the command and subordinate commands. Provide strategic plans, describing long-term plans. Prepare annual performance plans, containing short-term goals and performance measurements. Prepare annual performance reports, describing success or failure at meeting goals set out in the performance plans.<sup>16</sup>

4. Configuration Manager. Maintain close configuration management of all systems within the command and subordinate commands. Configuration management includes maintaining complete and accurate architectures, tracking hardware and software version numbers for all systems in order to readily accept changes and understand implications to the entire infostructure.

5. Joint System Interoperability Advocate. Facilitate system interoperability by reviewing functional processes and requirements with the goal of developing common joint systems among the commands, services, agencies and components.

6. Cross-Functional Requirements Advocate. Maintain a cross-functional perspective across all warfighting capabilities and business processes. The CIO should have overall

requirements authority and visibility into all personnel, intelligence, surveillance, reconnaissance, operations, logistics, planning, command and control, and communications systems. The CIO should be the single voice on all infostructure requirements for the command. During Y2K remediation, the Y2K Task Forces were able to look at warfighting processes across functional, organizational and geographic lines. Additionally, in industry, the Du Pont Corporation Y2K Team learned "the ability to work together across organizational lines and across geographies"<sup>17</sup> to solve the Y2K problem.

7. Tradespace Facilitator. Facilitate tradespace meetings and discussions between the command and command element warfighters (requirements), service/program managers (acquisition strategies), the industry (capabilities and cost) and department/service (budget) to shorten the decision cycle concerning system migration and new system acquisition. Shorter decision cycles will enable quicker acquisition of critical capabilities. The Command CIO must collaborate with various communities of interest and become a "knowledge sharer." "...The biggest challenges for successful knowledge management are cultural, not technological. In organizational environments, where knowledge often is power, people may have few incentives to disperse knowledge among their colleagues. To use the jargon of knowledge management, many are "knowledge hoarders" rather than "knowledge sharers."<sup>18</sup>

8. Innovation/Experimentation Advocate. Facilitate innovation and experimentation to address infostructure shortfalls. The CIO should prioritize innovative projects and

experiments in close coordination with the commands, services and agencies, to match resources for the greatest return on investment. Admiral Gehman recently stated that "Joint experimentation will attempt to determine, from a joint perspective, the best. We must be committed to accelerating the best and terminating some systems as wasteful failures, but knowing what doesn't work is perhaps the most important outcome of experimentation."<sup>19</sup>

9. Joint Requirements Advocate. Review all policies and doctrine to ensure that the alignment of infostructures and warfighting processes are compliant with joint policies and doctrine. Additionally, the CIO should review all policies and doctrine to ensure that alignment of new infostructures and warfighting processes are reflected in joint policies and doctrine.

10. Information Assurance Leader. Direct information assurance of the infostructure. The close integration of infostructure managers and those responsible for its security is critical. However, this should not preclude outside security review of the infostructure for information assurance.

11. Information Operations Warfighter. Direct information operations due to his close understanding of information architectures and the warfighting mission of the command. There may be implications towards one's own infostructure when engaged in information operations.

## **CIO Council**

One Combatant Command cannot represent all of the various warfighting perspectives on aligning information technology and warfighting capabilities. However, by bringing together all of the Combatant Command and Joint Task Force CIOs through a series of CIO Council meetings and video-teleconferences to work through specific warfighting issues, joint warfighter requirements can be brought forward for joint, service and agency implementation. Past examples of functional CIO Councils include the monthly Joint Staff and Combatant Command Y2K Task Force meetings and video-teleconferences; the Senior Warfighter's Forum (SWARF) within the Joint Requirements Oversight Council (JROC) process; the Department of Defense Intelligence Information Systems (DODIIS) Management Board (DMB) meetings; and the Intelligence Community CIO Council (IC CIO) meetings. These forums are in essence CIO Council meetings, aligning information technology and warfighting capabilities. By formalizing a CIO Council process, the commands could identify and prioritize joint warfighting requirements and explore the tradespace between joint requirements, acquisition strategies, capabilities, cost, and budget, resulting in quicker decisions on the migration of legacy systems and future system acquisition.

The Joint Forces Command (JFCOM) has recently been assigned a new role in representing joint requirements. Joint Forces Commander, Admiral Harold W. Gehman Jr., USN, recently stated "...it is time for the unified commanders in chief to stake out maybe half a dozen military capability areas and establish that, in these narrow areas, joint requirements supercede service requirements."<sup>20</sup> Admiral Gehman further stated "I'm convinced that the solution lies in giving a stronger voice in requirements and

acquisition to the unified commanders, the users of the military capabilities that the services produce."<sup>21</sup> Rather than leaving procurement decisions to the services, the Joint Staff is seeking input from the Combatant Commands to ensure that all weapons systems being developed are "born joint," according to Air Force Gen. Richard B. Myers, Vice Chairman of the Joint Chiefs of Staff.<sup>22</sup>

The Joint Forces Command should host CIO Council meetings and facilitate the tradespace discussions between the Combatant Command and CJTF CIOs, OSD (C3I), the Joint Staff, service and agency CIOs to gain consensus on joint infostructure requirements and resource allocation recommendations. The CIO Council's agenda should focus on solving prioritized warfighting infostructure issues. Among the areas that Admiral Gehman suggested the commanders have a stronger voice in setting military requirements and in deciding acquisition strategies include integrated air and missile defense; command and control; combat identification; intelligence, surveillance and reconnaissance; battlefield strike and joint fires; and strategic mobility and deployment.<sup>23</sup>

#### **Combatant Command and Joint Task Force Way Ahead:**

1. Recognize the role of information management in creating value (e.g. speed of command) and adopt the intent of the Clinger-Cohen Act by creating Command CIOs.
2. Position the Command CIO for success by placing the CIO within the CINC's or CJTF's special staff whereby the CIO reports directly to the Commander.
3. Ensure the credibility of the information management organization. Empower the CIO with overall command infostructure requirements and responsibilities and infostructure resource allocation recommendations.

4. Measure success and demonstrate results (e.g. return on information technology investment) through common, carefully selected metrics. Share cost-benefit analysis results with other CIOs.
5. Organize information management to meet warfighting needs. Horizontally integrate the Command CIO within all warfighting processes.
6. Develop information management human capital. Resource the Command CIO with the requisite expertise to accomplish the mission.
7. Participate in CIO Council meetings with OSD (C3I), the Joint Staff, services, agencies, other combatant commands and JTFs to gain consensus, and provide recommendations for joint, command, service and agency resource allocation implementation. Recognize the CIO Council as the leader in the Department of Defense information technology community.

**Conclusion/Recommendations:**

Creating and empowering Chief Information Officers within the Combatant Commands and Joint Task Forces will create organizational structures that will facilitate the alignment of information technology and warfighting processes and enhance the commander's speed of command. Bringing the Command CIOs together with their counterparts on OSD (C3I), the Joint Staff, services and agencies for CIO Council tradespace discussions will accelerate decision cycles for joint, interoperable system acquisition. The organizational, technical and cultural evolution will facilitate the transformation to Network Centric Warfare concepts.

**Bibliography:**

Alberts, David, John Garstka, and Frederick Stein. Network Centric Warfare: Developing and Leveraging Information Superiority. 2<sup>nd</sup> ed. Washington, DC: Department of Defense (DoD) C4ISR Cooperative Research Program (CCRP), 1999.

Crawley, Vince. "Joint Forces Command Gives Clout to Leaders." The Navy Times, 17 April 2000, 27.

Ferris, Nancy. "Everyone Wants to Evaluate IT Performance, But Few Have Figured Out How to Do It." Government Executive, February 1999, 19-23.

Frank, Diane. "Management Update Building a Blueprint for Agency CIOs." Federal Computer Week, 3 April 2000, 25.

Garamone, Jim. "JV2010 Needs Stronger CINC Voice." American Forces Press Services, 17 March 2000, 1-3.

Harnessing the Power of Netcentricity. Robert J. Smith School of Business, Maryland: University of Maryland, 1999.

Harreld, Heather. "The Right Stuff: What it Will Take to Join the Next Generation of IT Leaders, and a Few Who Will Make It." Federal Computer Week, 1 May 2000, 16-21.

Heller, Martha. "Sound Off: Can CIOs be Corporate Leaders and Still be CIOs?" CIO Magazine On-Line. <[http://comment.cio.com/sound\\_see\\_comments.cfm?ID=2167](http://comment.cio.com/sound_see_comments.cfm?ID=2167)>, (11 May 2000).

Joint Staff Year 2000 (Y2K) Task Force. Year 2000 (Y2K) Lessons Learned Conference Briefing. Pentagon, Washington, DC, January 2000.

Joint Staff Year 2000 (Y2K) Task Force. Year 2000 (Y2K) Steering Committee Meeting Briefing. Pentagon, Washington, DC, 9 February 2000.

Kelman, Steve. "Comment: Knowledge Management Truth or Fiction?" Federal Computer Week, 27 March 2000, 47.

Marsan, Carolyn D. "Management Strategies, Seeking New Challenges." Network World, 13 March 2000, 64.

Mathews, William. "Measuring Agency Performance: Out of Reach." Federal Computer Week, 3 April 2000, 22.

Radcliff, Deborah. "Business Case Study: Aligning Marriott." Computerworld, 10 April 2000, 58-60.

Siwolop, Sana. "Technology Management: Breaking Out of the Back Room: Corporate C.I.O.'s." The New York Times on the Web,

<<http://www.nytimes.com/library/tech/00/05/biztech/articles/10info.html>> (10 May 2000).

Thibodeau, Patrick. "Private Sector is Envy of Fed CIOs." Computerworld, 3 April 2000, 20.

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<sup>1</sup> Joint Staff Y2K Task Force, "Year 2000 Lessons Learned Conference Brief," January 2000.

<sup>2</sup> Vince Crawley, "Joint Forces Command Gives Clout to Leaders," The Navy Times, 17 April 2000, 27.

<sup>3</sup> Jim Garamone, "JV2010 Needs Stronger CINC Voice," American Forces Press Service, 17 March 2000.

<sup>4</sup> Joint Staff Y2K Task Force, "Year 2000 (Y2K) Lessons Learned Brief," 9 February 2000.

<sup>5</sup> Carolyn D. Marsan, "Management Strategies, Seeking New Challenges," Network World, 13 March 2000, 64.

<sup>6</sup> David Alberts and other, Network Centric Warfare: Developing and Leveraging Information Superiority, 2<sup>nd</sup> ed. (Washington, DC: CCRP 1999), 187.

<sup>7</sup> Ibid.

<sup>8</sup> Deborah Radcliff, "Aligning Marriott Business Case Study," Computerworld, 10 April 2000, 58-60.

<sup>9</sup> Patrick Thibodeau, "Private Sector Is Envy of Fed CIOs," Computerworld, 3 April 2000, 20.

<sup>10</sup> Sana Siwolop, "Technology Management: Breaking Out of the Back Room: Corporate C.I.O.'s," The New York Times on the Web, <<http://www.nytimes.com/library/tech/00/05/biztech/articles/10info.html>>, (10 May 2000).

<sup>11</sup> Ibid.

<sup>12</sup> Martha Heller, "Sound Off: Can CIOs be Corporate Leaders and Still be CIOs?" CIO Magazine On-Line, <[http://comment.cio.com/sound\\_see\\_comments.cfm?ID=2167](http://comment.cio.com/sound_see_comments.cfm?ID=2167)>, (11 May 2000).

<sup>13</sup> Sana Siwolop, "Technology Management: Breaking Out of the Back Room: Corporate C.I.O.'s," The New York Times on the Web, <<http://www.nytimes.com/library/tech/00/05/biztech/articles/10info.html>>, (10 May 2000).

<sup>14</sup> Ibid.

<sup>15</sup> Diane Frank, "Management Update Building a Blueprint for Agency CIOs," Federal Computer Week, 3 April 2000, 25.

<sup>16</sup> William Mathews, "Measuring Agency Performance: Out of Reach," Federal Computer Week, 3 April 2000, 22.

<sup>17</sup> Carolyn D. Marsan, "Management Strategies, Seeking New Challenges," Network World, 13 March 2000, 64.

<sup>18</sup> Steve Kelman, "Comment, Knowledge Managements Truth or Fiction?" Federal Computer Week, 27 March 2000, 47.

<sup>19</sup> Jim Garamone, "JV2010 Needs Stronger CINC Voice," American Forces Press Service, 17 March 2000.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> Vince Crawley, "Joint Forces Command Gives Clout to Leaders," Navy Times, 17 April 2000, 27.

<sup>23</sup> Jim Garamone, "JV2010 Needs Stronger CINC Voice," American Forces Press Service, 17 March 2000.