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C-212 User's Epistle on Text Chat Tool Acquisition

Topic: Governance of Collaboration

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A User's Epistle on
Text Chat Tool Acquisition

Just as leaders of the world wars of the 20th century exploited advances in the industrial revolution, military leaders today exploit the information revolution. Despite the hindrance of current military command, control and communications (C3) to a hear to a classic Napoleonic hierarchy, information revolution values strategically enable principles like Net-Centric Warfare and challenge the status quo.

With a revolutionary technology like 'text chat," a monopoly of naysayers produce a litany of obstacles that predict inevitable failure and a monopoly of ideologues' insist that only the purest implementation can succeed. The rest of us plug away-testing, innovating, and using the new technology in any way in which it works better than the old way. It is often said in the C3 world that amateurs talk "tools" while professionals discuss "capabilities." This paper provides an acquisition philosophy to encourage "Text Chat" as a universally viable military capability. As the information age progressed, individuals came to regard Text Chat as a normal mode of communication. Chat Rooms enable members of a workgroup to visually "converse" and can include the ability to record that conversation.

In recent conflicts in Afghanistan and Iraq, the Text Chat application of choice in the battle arena and many Department of Defense (DOD)/Intelligence Community facilities is Mardam Internet Relay Chat (mIRC). mIRC is a Windows Internet Relay Chat (IRC) client written by Khaled Mardam-Bey. Although it has not been approved for use within the DOD, Air Force and Air Operations Center (AOC) organizations worldwide want to use it as a collaborative tool. Few understand how mIRC succeeds as an "Information Revolution" Text Chat tool viable for military use. It creates a powerful collaborative virtual environment in very low bandwidth that allows operators on robust communications to commune with fielded warfighters on disadvantaged communications. mIRC chat servers in Bahrain create a cyber community of over 2700 ongoing conversations in one Regional Combatant Commander's area of responsibility. It has been reported that over 1253 Joint organizations exchange textual information via the Bahrain mIRC servers. Operators share a physical connection to a common network (SIPRNET) on which these servers are located. Two Information Revolution principles demonstrated for the first time in recent conflicts are military action offices (AOs) "swarming" in cyberspace to quickly solve emerging problems and the "flat earth" model of decision making in which AOs are empowered to make or coordinate decisions rather than forcing information up the classic Napoleonic hierarchy for processing.

Despite lack of formal approval, mIRC has been used in the field and gained notable acceptance. Continued use does present a number of risks and raises concerns. One significant issue is that mIRC is shareware, not freeware. The license allows evaluation for 30 days after which the software is to be purchased. Purchasing mIRC has been considered, but the developer's Palestinian, Syrian, and Jordanian ties and proprietary closed source nature of the code are a concern.

The principal concern stems from licensing, support, and security issues. A DOD request to use the code without paying was emphatically denied. If licenses are acquired for Government use, reliability and security would have to be assured. The DOD requested access to the source code for analysis and was refused. Statements by Mardam-Bey cast

doubt on the suitability of using mIRC for mission essential tasks on classified networks. The mIRC client is currently used to directly support National security missions and is a critical element in the warfighting effort. The software is so essential that lack of formal approval from DOD or the developer and questions of security are considered a negligible risk. Justification for continued use is difficult as free evaluated IRC chat clients and evaluated commercial chat software have been used successfully in wartime operations. The freeware solution, doIRC, is used in the Global Command and Control System (GCCS) and is to be an official part of future Theater Battle Management Core Systems releases. The commercial solution, Webbe, is Joint Interoperability Test Command (JITC)-certified and has been used extensively in operational environments by Naval Special Warfare Units.

Organizations like Air Combat Command (ACC)/DOY and SCW have done surveys of requirements for an IRC capability for the AOC. All Text Chat tools provide a collaboration environment that enables interaction among users and decision makers. Information sharing, issue-resolution strategies, and system support products enable users to jointly recognize the interplay of operational decisions that foster team coordination and virtual cohesion. Specific vendor technologies include sharing, advanced white-boarding, human-machine partnership (groupware), and facilitation. Text Chat capabilities can significantly enable military members to perform most office-oriented and operational communication tasks from their desktops. Collaboration capability is tied to a central military goal of empowering end users by channeling the information flood into a reservoir for enterprise wide decisions. Execution of this goal will provide a cohesive, interoperable, streamlined business process.

At a minimum, the Core Enterprise Service must provide synchronous secure net-centric capability of Text Chat enabling ubiquitous real-time collaborative interaction among all group members (including edge-users from any platform) that is persistent and uses related net-centric services (including discovery, storage, Information Assurance/Security). Any Text Chat tool should also support workgroups, individuals, and communities of interest with repositories for discussion.

The perfect tool would provide simultaneous "one-to-one" private text chat and "many-to-many"; support ability of users and administrators to time-stamp, save, archive and retrieve chat sessions; authenticate bulletins and alerts using digital signatures, certificates or other validation method; and perform simultaneous foreign language translation for text data. Our perfect tool would provide chat capability between multiple individuals using profiles as the connection medium. It would be able to send a notice (pop-up) to anyone logged on the network and not require the user to run chat application to initiate a session. The user would have the ability to toggle the pop-up capability on and off. Users would run multiple chat sessions simultaneously. This wonderful device would provide the ability to send a notice to users that they are being bumped out of a chat room by the monitor rather than the application if chat room capacity is exceeded. At the same time, it would provide capability for threaded discussions and the option to save/archive chat sessions. The last function of ideal Text Chat tools would provide synchronous capability to access organic directory services.

The "perfect tool" is one of the obstacles ideologues argue must be created before enterprise implementation can even start. If this argument is not overcome, "good

enough" technology like mIRC which works better than the old stuff (e.g., no widespread Text Chat tool) will continue to garner fielded warfighter support.

We cannot compete with the monopoly of the ideologues or the monopoly of the naysayers of the new technology by playing by the monopolist's rules. Both groups have the characteristics of any monopoly they have political clout, various members can present "logical" arguments and access to financial resources-- in sum, too many strengths. To compete and win against their arguments, we must change the rules.

At the end of the nineteenth century, the monopoly was railroads. Major railroads held effective monopolies on transportation between major cities. Indeed, major cities like Chicago developed around central terminals owned by railroad companies. These monopolies were not broken by new railroads that charged less. They were rendered obsolete by an interstate highway system and the door-to-door delivery trucking companies offered over limited point-to-point delivery from railroads. Owners of existing proprietary "text chat" schemas own a technology reminiscent of the railroad monopoly and could suffer the same fate. Military users of text chat cannot wait while collaboration vendors "duke it out." Most commercial software ventures, free or proprietary, fail. To the perpetual dismay of the technical-computing community, the best technology seldom wins. Building a better mousetrap does not assure success. If it did, we would have Beta[1], not VHS, VCRs and calculators would use reverse polish notation[2]. Until recently, software ventures were proprietary and it is safe to say that software development and marketing is a difficult way to make a living. Vendors try to gain market share through service to the military community. Often, their marketing skills are better than their product. Many companies attempt a partially open-source approach to marketing, adopting a license that allows free distribution of software if the user does not use it for commercial or Government purpose. If such use is considered, the user must pay a license fee or royalty. The military should not use their considerable economic clout as proponent for a single vendor in the text chat industry. We need a methodology that interconnects the most users, regardless of Service or location. Hence, the issue is not tools or the ability of a vendor's product compared to a theoretical model, but the number of users affected.

We must embrace the model of the car industry. We get parts from a large number of suppliers. No one drives a "car" - we drive Hondas or Fords - assembled from parts culled from a vast variety of sources. Few organizations or individuals have the technical ability to assemble vehicles independently. If they could, they have neither the time nor

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[1] Though all but forgotten in today's consumer electronics, Sony's Betamax format video tape recorders hold a special place history. Sony promoted Beta by stressing its better quality. But most people didn't seem to care and anyway the difference is slight.

[2] Reverse Polish Notation (RPN) was developed in 1920 by Jan Lukasiewicz as a way to write a mathematical expression without using parentheses and brackets. Hewlett-Packard Co., realizing that Lukasiewicz's method was superior to standard algebraic expressions when using calculators and computers, adapted RPN for its first hand-held scientific calculator, the HP35, in 1972. RPN is not the predominate method of data entry into calculators and computers today.

inclination. Assembly and service are the core of the automotive business model. Similarly, Text Chat tools must be considered "parts" of the collaboration collective "vehicle." The goal is to exchange information, not to support a single vendor software business model.

The birth throes of "text chat" are similar to those of the personal computer (PC). When IBM published the specifications to its PC in 1981, why did the world adopt this model with such enthusiasm? The original 8086-based PC shipped with 64K (yes, K!) bytes of main memory and an upper memory limit of 640K. No one could imagine that a single user would need more. A tape cassette recorder provided data back-up. What drove the PC revolution was that it provided users CONTROL over their computing platform. They could buy a first PC from IBM, a second from Compaq, and a third from HP. They could obtain memory or hard drives from any of a hundred suppliers and an almost infinite range of peripheral equipment was available. The new model brought a morass of inconsistency, incompatibility, and confusion between technologies, products, and suppliers. But, as the world now knows, consumers love choice. They will tolerate confusion and inconsistency to access choice and control. Note that the PC hardware industry did not fragment. Specifications remained open and there is strong pressure to conform to standards that preserves interoperability. No one has a sufficiently better "mousetrap" to entice users and hold them hostage by going proprietary. Just as control drove PC interoperability, the number of users connected will determine winner and losers in the Text Chat "wars."

The significance of interconnection is undervalued. Many chat tools failed in transit from laboratory to real world because they did not address the need for scalability in military tools. The number of pairwise connections required as the user's base increases to support a theater size war is not encountered in the civilian market. Metcalfe's Law provides a theoretical solution. It states that the value of a communication system grows at approximately the square of the number of users (N^2).

$$N(N-1), \text{ or } N^2-N.$$

Robert Metcalfe, founder of 3Com Corporation and designer of the robust Ethernet protocol for computer networks observed that new technologies are valuable only if many people use them. Specifically, the utility of a network is equal to the square of the number of users. The more people use your software, network, standard, game, or book, the more valuable it becomes and the more new users it attracts, increasing both its utility and speed of its adoption. An example of the power of Metcalfe's law is: if only two people in the world can call only each other, a phone is of little value. If we can call nearly everyone else in the world, its value is irrefutable.

RFC 1459-Internet Relay Chat Protocol (Internet Relay Chat) was designed over a number of years for use in text-based conferencing. The standard is not proprietary, the unwritten hope of users is that the RFC standard, will overcome that magical Metcalfe hump. IRC protocol was developed for use on systems using the TCP/IP network protocol.

IRC is a teleconferencing system that, through use of the client-server model, is well-suited to running on many machines in a distributed fashion. A typical setup involves a single process (the server) forming a central point for clients (or other servers) to connect, performing the required message delivery/multiplexing and other functions. The server is

the backbone of IRC, providing a point to which clients and other servers may connect and form a network. The only network configuration for IRC servers is a spanning tree in which each server acts as a central node for the portion of the net it sees.

A client is anything connecting to a server that is not another server. Each client is distinguished from other clients by a unique name with a maximum length of nine characters. In addition to the name, all servers must have the real name of the host on which the client is running, username of the client on that host, and the server to which the client is connected. The RFC is standard. Generally, vendors of tools implement the standard that supports their business model. There are other mandatory standards for tools running on military networks. These principles are often used by naysayers of new technology to slow, stop, or kill innovative capabilities. Generally, the system should comply with the requirements of the following Public Laws, DOD and Air Force directives, and policies and standards.

Section 508. - The tool shall comply with the Workforce Investment Act of 1998, Section 508, Electronic and Information Technology by following the relevant guidance established in Section 1194.22 of the Electronic and Information Technology Accessibility Standards Document.

Interoperability Standards. - The system shall meet interoperability standards and be certified by the JITC.

DOD Joint Technical Architecture (JTA). The system shall comply with DOD JTA standards.

DOD 5015.2-STD. - The system shall be compliant with DOD 5015.2-STD, Design Criteria Standard for Electronic Records Management Software Applications, Chapters 2 and 4.

Secretary of Defense (SECDEF) Memorandum, DOD Collaboration Interoperability Standards, Nov 02. The system shall comply with SECDEF Memorandum DOD Collaboration Interoperability Standards announcement.

DOD Information Technology Security Certificate and Accreditation Process (DITSCAP). - The system shall comply with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6211.02B Defense Information System Network (DISN) Policy Responsibility and Processes to enable DITSCAP.

DOD Public Key Infrastructure (PKI). - The system shall comply with DOD PKI program and support use of the Common Access Card for authentication, authorization, digital signature and encryption.

Global Command and Control System-Air Force (GCCS-AF). - The system shall comply with GCCS-AF Integration Framework requirements to include the presentation layer (e.g. Air Force Portal, single sign-on).

i-Technical Reference Model (TRM) Application Support. The system shall be capable of working with i-TRM listed office automation software products such as applications for electronic mail, word processors, spreadsheets, databases, desktop publishers, electronic data interchange systems, and web technology applications to capture web pages and links. (See DOD 5015.2 STD, Paragraph C3.2.3)

Secretary of Defense - The system shall comply with the SECDEF Memorandum, DOD Net-Centric Data Strategy, 9 May 03.

Generally, if an application reaches the field, military standards may be reached or waived, but some vendors use military standards to achieve a competitive advantage.

In conclusion, a military Text Chat tool must be as simple and available as any daily covenant. The goal is to make Text Chat as simple and available as a bottle of Ketchup on any local diner's table. Ketchup is nothing more than flavored tomato paste. Something that looks and tastes a lot like Heinz Ketchup can be made in your kitchen without so much as bending a copyright rule. It is comprised of freely redistributable objects: tomatoes, vinegar, salt and spices. So why don't we, as consumers, make ketchup and how does Heinz hold 80% of the ketchup market?

We don't make ketchup because it is cheaper and more convenient to buy it from Heinz, Hunts, or Del Monte than it is to make it. But convenience is only part of the story. Convenience alone suggests that Heinz, Hunts, and Del Monte share the market equally because they offer equivalent convenience. In fact, Heinz owns 80% of the market.

Heinz owns 80% of the market not because Heinz tastes better. If you go to the Third World and find 100 people who have never tasted ketchup, you discover two things: one - people don't actually like ketchup and, two-they dislike all ketchups equally.

Heinz has 80% of the ketchup market because they have been able to define the taste of ketchup in the mind of consumers. We need to define in the minds of "Text Chat" users the military utility of connecting all users. Now, the Heinz brand is so effective that as consumers we think ketchup that will not come out of the bottle is somehow better than ketchup that pours easily!

Collaboration occurs every day by traditional methods such as telephone calls, meetings, and e-mail. New technologies and communication architectures offer significant enhancement in exchanging information across the enterprise down to the desktop. Collaborative tools facilitate sharing information and resources, and coordinating among individuals across geographic and temporal boundaries. These tools should accommodate all variations on interpersonal and group interactions (one-to-one, one-to-many, many-to-one, many-to-many). They should be dynamic and have the flexibility to support formal, informal, and ad hoc collaboration. They should be natural and intuitive to use. They should support taxonomies such as:

- Same time/same place
- Same time/different place
- Different time/same place
- Different time/different place

In the past the communication in wars was by two general methods: on the battlefield by flags and horns and off the battlefield via written message. On the battlefield today, communication is via telephone and radio and off the battlefield via TCP/IP networks. NOW is the time and place to provide the opportunity to offer convenience and quality and, most importantly, help define in the minds of our customers what text chats can accomplish militarily.

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