

Understanding the Application of Knowledge Management in a Technology Driven Industry

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AIAA Membership

- ◆ The American Institute of Aeronautics and Astronautics (AIAA) has over 30,000 members. It also publishes 8 peer-reviewed technical journals and hosts over 20 technical conferences a year. AIAA has recently completed the process of digitizing its entire technical library (*explicit knowledge*) which encompasses over 50 years of publications.

AIAA Disciplines & Technical Committees

The technical work of the AIAA society is performed through 69 Technical Committees (TC). These TC's are arranged into seven basic disciplines:

- ◆ Aerospace Sciences
- ◆ Aircraft and Air Transportation Systems
- ◆ Engineering & Technology Management
- ◆ Information Systems
- ◆ Propulsion and Energy
- ◆ Space and Missiles
- ◆ Structures, Design and Test

Knowledge

- ◆ There are (at least) two types of knowledge:
 - **Tacit** and **Explicit**
- ◆ **Tacit knowledge** is stored in the brain
- ◆ **Explicit knowledge** is represented by papers, videos, procedures, etc.
- ◆ Perspective is important, one persons "explicit knowledge" is another persons "information"
- ◆ Conference papers and archival papers are an *attempt* to transfer tacit knowledge from one person to another

*Human-human interactions are crucial to effective and efficient knowledge transfer-
i.e. "story telling"*

Why Knowledge Management ?

- ◆ The benefits of Knowledge Management are traditionally focused on reducing cost and risk; Leveraging existing assets to reduce cost, risk & cycle time, Improved Decision Making, Improved Strategic Planning, Faster Development of New Technical Approaches, Faster more Robust Problem Solving, Reduced Cost of Employee Training and Increased Versatility of the Workforce.
- ◆ These can benefit almost any business, but there are additional benefits in a technology driven industry like Aerospace or Computing.

Why Knowledge Management ?

- ◆ KM is crucial for corporations, the defense department, Universities, and any other large organization
- ◆ KM is 95% culture-people-politics-process and 5% Technology
- ◆ How do we get people to join an on-line community and share information, which we hope leads to increased productivity and innovation? What's In It For Me (WIIFM)?

What's In It For Me (WIIFM)?

People want to:

- Be efficient
- Have access and leverage of others' knowledge
Be integrated into the industry direction
- Be mentored and trained
- “Because wealth creation is now in people’s heads rather than in their hands, your success will depend not only on your ability in managing workflow but on your talent in enticing from each person his best ideas, judgments, and effort.”

Frances Horibe

Information and Knowledge

- ◆ Information is not knowledge
- ◆ Information is usually simply “data” (numbers, text, images, sound, ...)
- ◆ 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”
- ◆ And wisdom is more than just knowledge

(Davenport and Prusak)

Return on Intellectual Capital

You don't have to teach everyone everything. The goal isn't to stuff the same knowledge into as many heads as possible, but to improve your return on intellectual capital. You can reduce the efforts of many by leveraging the knowledge of a few.

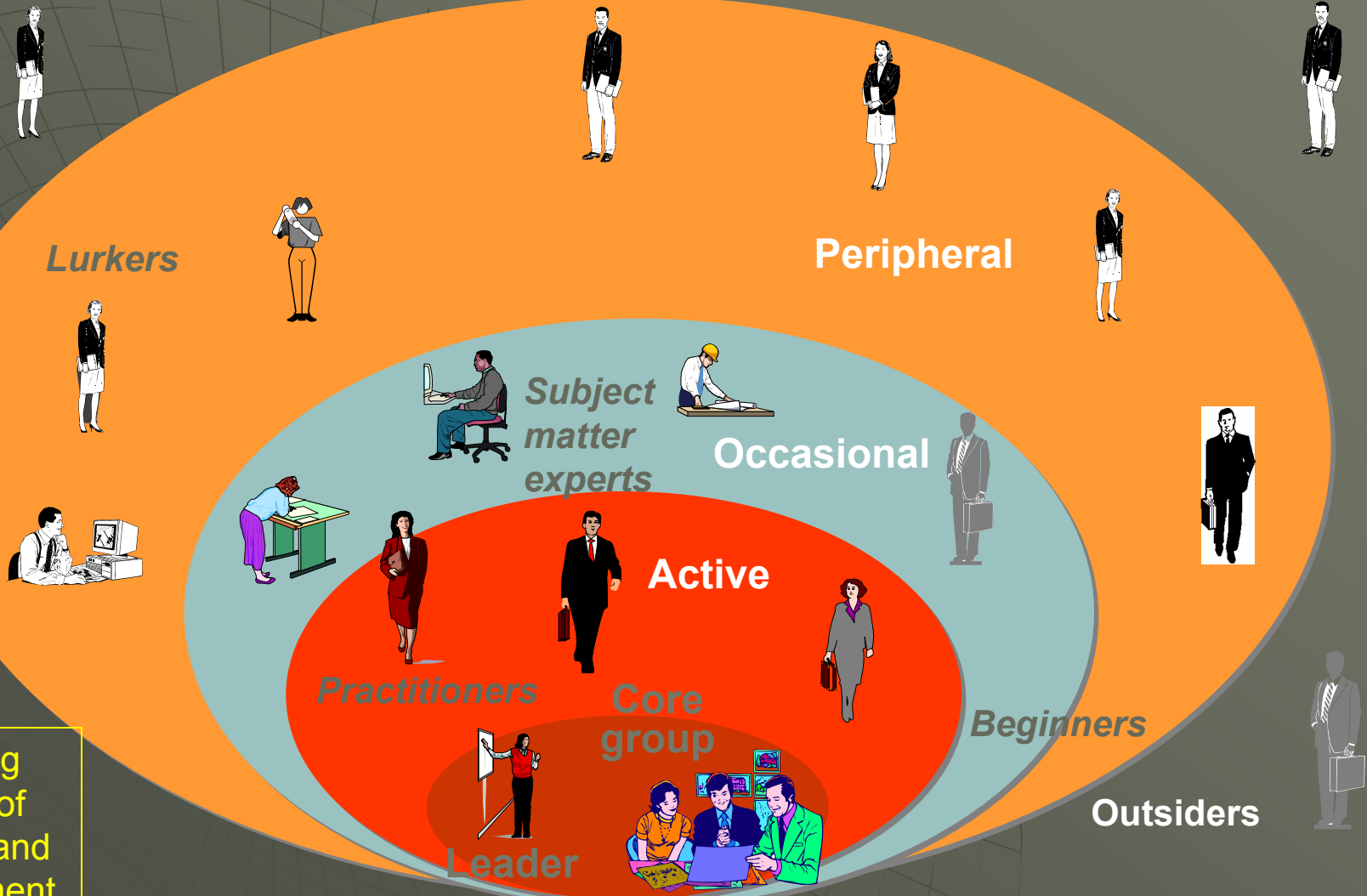
- Thomas A. Stewart



Communities of Practice (CoP)

- ◆ “Communities of Practice are 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)
- ◆ “CoP’s are not just a web site, a database, or a collection of best practices. It is a group of people who interact, learn together, build relationships, and in the process develop a sense of belonging, and mutual commitment.” (Wenger)
- ◆ “Without Communities of Practice, there can be no knowledge management.” (Wenger)
- ◆ In the last 10 years electronic CoP’s have been developed that are very effective (e.g. **companycommand.army.mil** with 20,000 members)

CoP Model: Participation*

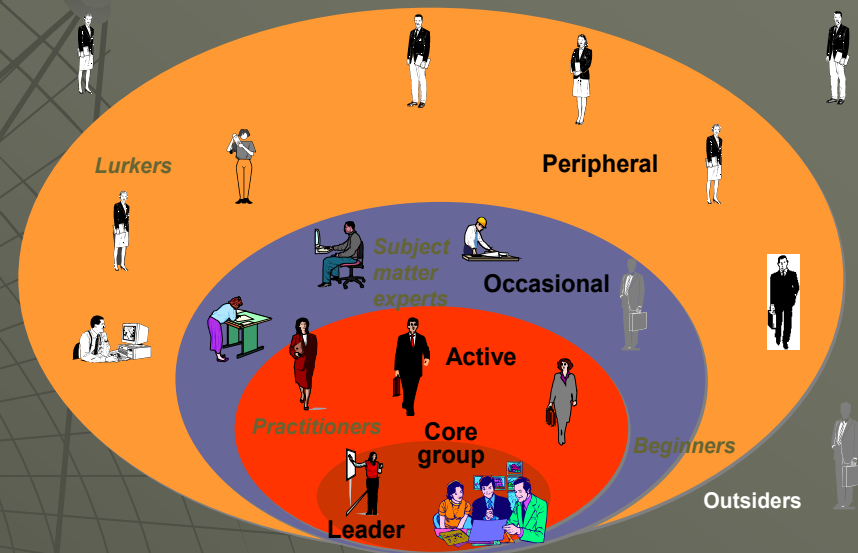


Varying levels of access and involvement

* From the work of Etienne Wenger

Access Control Lists

- ◆ ACL's are crucial to making it all work
- ◆ In a CoP, the various levels of users require different levels of access (none, read, edit, delete, ...).
- ◆ This refers to more than just file access, it also refers to the layout of the website, user accounts, access to various portions of website, ...
- ◆ Portions of CoP might be open to world, and portions might require high security



* From the work of Etienne Wenger

AIAA Knowledge Management- Strategic Plan

The AIAA Knowledge Management strategic plan lists eight goals:

1. Focus AIAA Activities on Critical and Emerging Technologies, Capabilities, and Programs
2. Strengthen Internal and External Communications
3. Improve and Expand Services and Benefits to AIAA Members
4. Increase the Depth and Breadth of AIAA Membership
5. Establish AIAA as the Voice and Advocate of/ for the Profession
6. Stimulate Workforce Development and Retention
7. Fully Utilize Information Technology
8. Communicate and Involve our Stakeholders in the Implementation of the Strategic Plan

AIAA KM Committee Recommendations

1. Establish virtual (online) Communities of Practice (VCoP's) to allow the members to communicate easily and continuously. AIAA would enable every TC, every journal, and every conference organizing committee to create and manage (on their own) online community. These online communities will increase the value of being an AIAA member, increase the interest in the AIAA digital library, and make it easier for the TCs and journals to function.

AIAA KM Committee Recommendations

2. Create several (3 – 5) key online communities as initial deployments or pilots, with teams of people willing and able to help make it a success. Starting with VCoPs that we believe to have a high success rate will continue to improve the model and the process as VCoPs are extended to other areas of the AIAA. Incremental development, careful deployment, and selection of areas for rich opportunity would allow for a 3-5 AIAA communities to launch in 2006, with another 3-5 communities launching in 2007.

AIAA KM Committee Recommendations

3. We recommend launching the pilot VCoPs for the following AIAA communities:

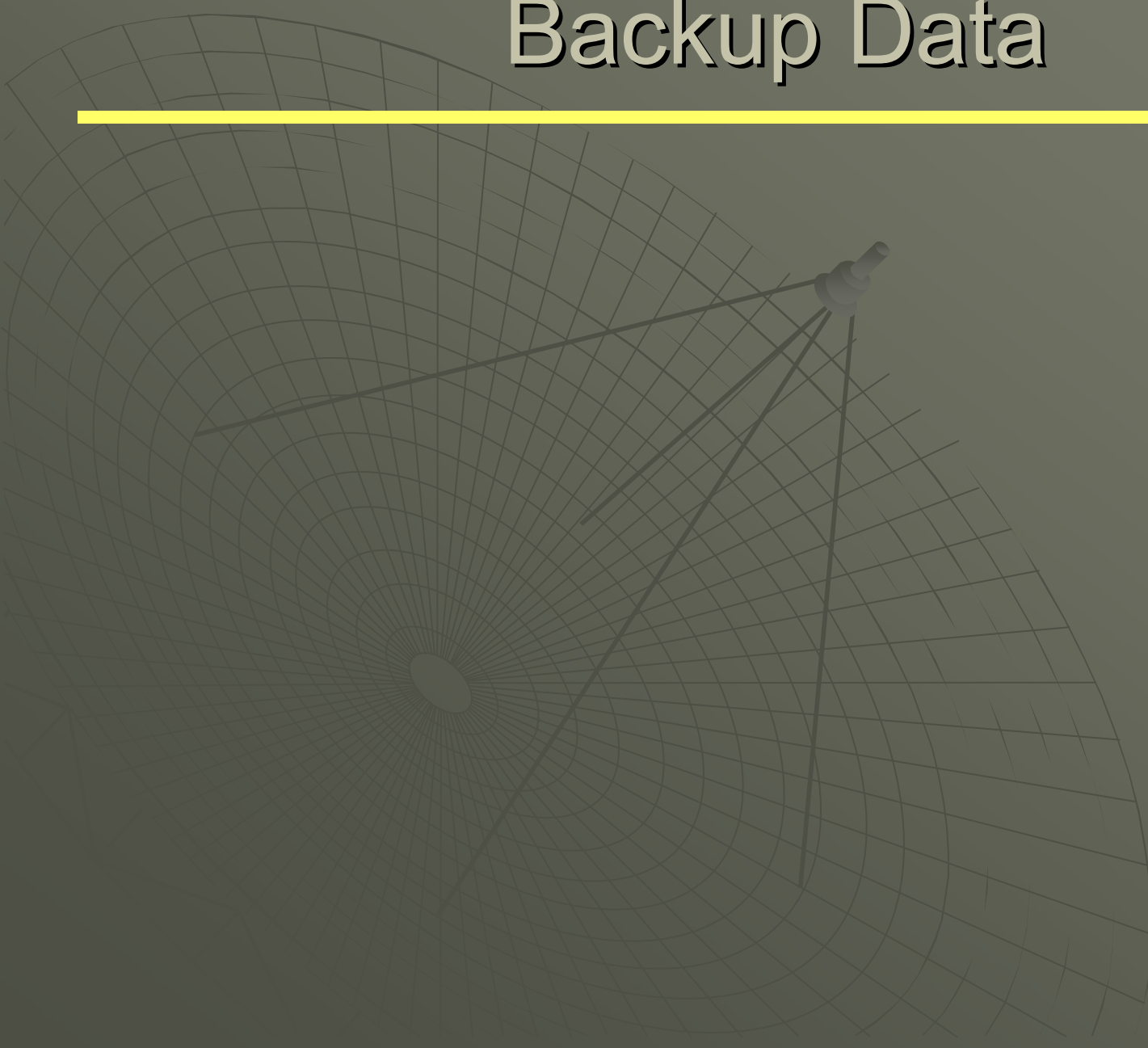
- ◆ The Journal of Aerospace Computing, Information, and Communication (JACIC) community
- ◆ Software Systems and Computer Systems Technical Committees
- ◆ Systems Engineering Technical Committee

Conclusion

Success criteria for the proposed start-up AIAA VCoPs should be assessed using metrics such as papers submitted, web hits, assessments, and user surveys. The AIAA KM Committee would support the members, assist with the tool selection, and monitor the metrics.

The tacit knowledge resides in people, and there must be a priority to begin transferring and sharing that knowledge now. Knowledge reuse is an important part of retaining the US competitive position in aerospace.

Backup Data



CoP Software

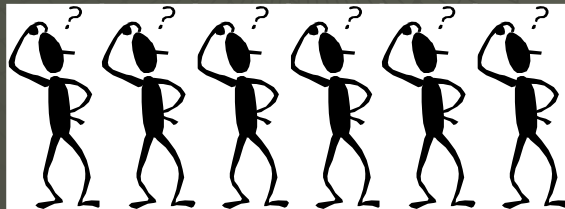
- ◆ The most difficult thing for most people to understand is that most CoP sites let ALL MEMBERS modify the website content (and very easily).

Traditional Webpage CoP

The
"Webmaster"



This causes tension because people don't have control anymore...but this is good.



Web Browsers

CoP

The
Community
IS the
Expert



*Everyone can easily change content₁₉
thru web browsers*

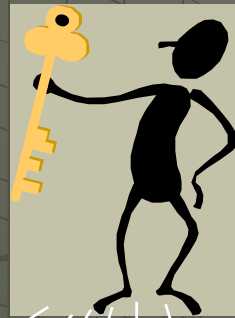
Archival Journals

- ◆ The foundation of science and engineering
- ◆ Paper versions are expensive to produce, distribute, and store
- ◆ Information that is not on-line will be used and referenced less and less (“if it isn’t online, it doesn’t exist”)
- ◆ The American Institute of Aeronautics and Astronautics (AIAA) has its *entire archive* of conference and journal papers scanned and available on-line (40 years of technical papers) (www.aiaa.org)
- ◆ NASA has begun to convert both NACA and NASA papers to electronic form
 - <http://techreports.larc.nasa.gov/ltrs/ltrs.html>
 - <http://ntrs.nasa.gov>
 - <http://naca.larc.nasa.gov>

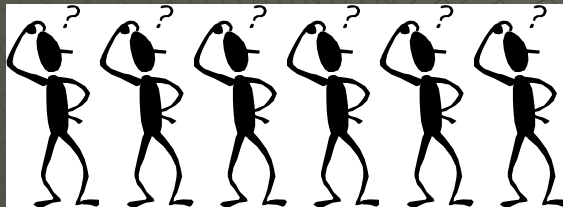
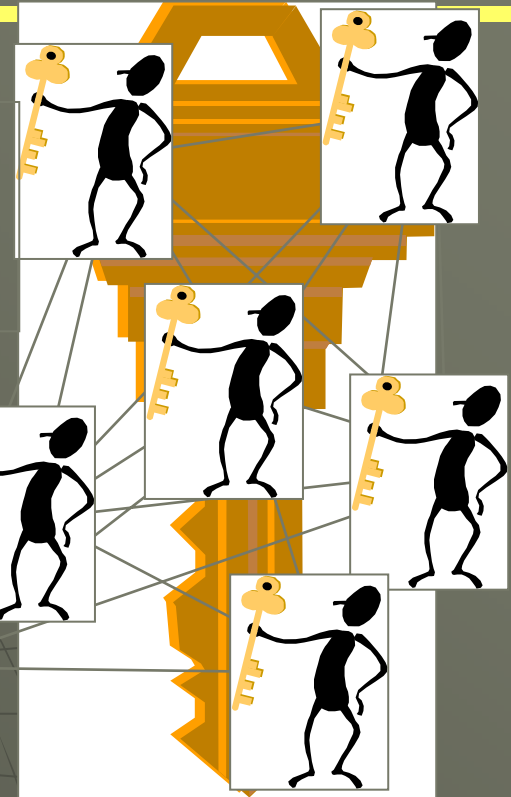
Archival Journals

CoP

The Expert



The Community IS the Expert



The merging of Journals and CoPs will create a system for creating new knowledge while balancing that knowledge with a validation scheme. The CoP and the journal should meet through a multi-tiered validation system that transports CoP style informal conversational knowledge into fully validated explicit knowledge



AIAA Computer Systems Technical Committee Home

Quick Launch

- [General Discussion](#)
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Events

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- | | |
|---------------------|---|
| 10/20/2003 12:00 AM | 18th Annual OOPSLA
Object Oriented Programming, Systems, Languages and Applications |
| 10/30/2003 12:00 AM | Intl. Conf. on Compilers, Architectures and Synthesis for Embedded Systems
Demand for high performance embedded computing and increases in complexity of embedded software require leveraging diverse architecture, microarchitecture and compiler research. Application-specific solutions are needed in embedded areas, such as digital... |
| 11/10/2003 12:00 AM | 15th Syposium on Computer Architecture and High Performance Computing
SBAC-PAD is an international annual conference, started in 1987, which has continuously presented an overview of new developments, applications, and trends in parallel and distributed computing technologies. SBAC-PAD is open for faculty members, researchers,... |
| 11/19/2003 3:00 PM | Joint TC Telecon
Call in Number to be provided on 11/17. |
| 1/5/2004 12:00 AM | AIAA Aerospace Sciences Conference
The 42nd AIAA Aerospace Sciences Meeting and Exhibit with its traditionally multidisciplinary character provides an ideal forum for scientists and engineers from industry, government, and academia to share and disseminate the scientific knowledge and... |
| 1/5/2004 9:00 AM | Joint TC Meeting |

Links

[Add new link](#)

- [AIAA Conferences](#)
- [JACIC \(new Journal\)](#)
- [DASC Website](#)
- [AIAA SSTC Web Site](#)
- [AIAA CSTC Web Site](#)
- [Main CSTC Web Site](#)
- [AIAA Technical Committees](#)
- [AIAA Home Page](#)

companycommand.army.mil

(uses Tomoye Simplify)

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guest (Read)

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A Web site by and for Company Commanders--past, present, and future...[read more](#)

Photo: [Dexter Holley \(B/2-72 AR\)](#)

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CMD Quiz

Q: Does "training" fit into an operational environment?

Take Quiz

[View Results](#)
19 Comments

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- Training
- Fitness
- Force Protection
- Maintenance
- Supply
- Soldiers & Family
- Pro Readings
- Rally Points
- Cdrs' Log

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During Oct/Nov, we are focusing on **"Training."** Go to that section of the site, take this month's Cmd Quiz, join ongoing discussions, and contribute your training ideas.

Most Recent Discussions:

To post discussions you must be registered and logged on

Discussion Forum	Thread	Posts	Last Post @
CompanyCommand General Discussion	1SG Duty Description	2	2003-10-22 5:08 pm
Training: Open Discussion	CS/CSS Battlefield Survivability	7	2003-10-21 11:58 pm
CompanyCommand General Discussion	Convoy Operations Lessons Learned Needed	7	2003-10-21 11:35 pm
Warfighting Discussion	Civilian GPS in Iraq?	7	2003-10-21 6:47 pm
Training: Open Discussion	Training TTPs: What is working?	5	2003-10-21 4:37 pm
CompanyCommand General Discussion	Body Armor	6	2003-10-21 2:20 pm
Fitness Discussion	Profile PT Program	1	2003-10-20 3:09 pm
Video OPD: Open Discussion	Leadership in Operation Iraqi Freedom	2	2003-10-19 8:08 pm
Training Quiz: Open Discussion	Training in Operational Environment	1	2003-10-19 8:51 am
CompanyCommand General Discussion	Change of Command	7	2003-10-15 11:53 pm

Featured

in CompanyCommand

- [Growing the Next Generation of Leaders](#)
- [To Kill or Not to Kill: a Cdr Sets the Example](#)
- [Training Priorities: What is Important to You?](#)
- [Cdrs' Log](#)
- [Training TTPs: What is working? \(5\)](#)
- [Company Commanders' Combat Observations/Lessons Learned](#)
- [Interviews with Company-Level Leaders in War](#)

Featured Challenge:

[Commander Stress](#)

[Take the Challenge](#)

Featured Video OPD:

CMD Update

[AUG/SEP 2003 C-LL Newsletter \(Issue #26\)](#) ★★☆☆☆ The CDR/1SG Relationship (1 comment)

Special Book Program

platoonleader.army.mil

(uses mySQL and PHP, ie free software)

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19:03 Bragg 18:03 Hood 16:03 Lewis 08:03 Korea 04:33 Afghanistan 03:03 Iraq 01:03 Bosnia

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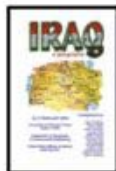
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- [026 Cheat Sheet](#)
- [APFT Roster Score...](#)
- [11 ACR Miles Inve...](#)
- [Retrans Team Trai...](#)
- [2-69AR Convoy Ops...](#)

What's HOT!



[Physical, Cultural, and Military
Geography of Iraq—PDF](#)

Survey

The most important Leader
Competency is:

21 Oct 0630 EST



Check out some of the Q&A's from some company leaders currently serving in IRAQ: **Video OPD, LT O'Hern; A Wise LT; CPT Morgan, Jake Jacobs, 2LT Blickhahn, LT Mitroka, LT Stuewe, LT Mason, CPT Polsgrove, CPT Woodward, CPT Zinn, Shock Troop and CPT Toti, CPT McGahey, 2LT Mead, CPT Wrann, LT Pickler, LTC Barbee, 1LT Marcee.**

Monthly Newsletter: [Register here!](#)

Recent discussions in the PL Forums

Forum	Topic	Replies	Views	Last Post
Special Forces	General Boykin	11	377	10/22 18:27
Pre-Commissioning Questions	Grossly unprepared	7	444	10/22 18:04
Field Artillery LT's	Wait on FAOBC	1	57	10/22 16:39
Armor LT's	Armor OBC, November 17, What t...	10	341	10/22 15:38
Transportation LT's	Eustis Suggestions	18	414	10/22 14:13
Platoon Leader Questions	Hard headed squad leader	28	1374	10/22 13:44
Platoon Leader Questions	Conduct in Uniform	28	1671	10/22 12:24
Platoon Leader Questions	Any thoughts...	14	1025	10/22 11:44
Field Artillery LT's	Cell Phone service at Ft. Sill...	3	88	10/22 11:29
Aviation LT's	What to do?	8	342	10/22 10:44
MI LT's	MI vs other branches	2	234	10/22 01:20
Transportation LT's	deployments in the 6th batalli...	2	75	10/21 20:52
Quartermaster LT's	Duty Stations CONUS	1	67	10/21 19:13
Armor LT's	Not taught in AOBC	1	238	10/21 18:56
Reserve Component Issues	Paying for OBC	6	234	10/21 16:44

[Read ALL forum postings since your last visit](#)
Only works if you are Registered & Logged On

Daily Quote

"The essential thing is action. Action has three stages: The decision born of thought, the order or preparation for execution, and the execution itself. All three stages are goverend by will. The will is rooted in character, and for the man of action character is of more critical importance than intellect. Intellect without will is worthless. Will without intellect is dangerous."
-- Von Seek

[Email Us your Quote](#)

Who's Online

There are currently, 24 guest (s) and 6 member(s) that are online.

[drill_it](#), [SEPPL](#), [more...](#)

You are Anonymous user. You can register for free by clicking [here](#).

Last Seen

[LtGoForBroke](#): 54 seconds ago
[M_Raymond](#): 2 minutes ago
[Drill_LT](#): 6 minutes ago

www.companycorcommand.com

- ◆ Largest and most successful CoP in the DOD
- ◆ Created to help army captains share information and knowledge
- ◆ ~80,000 hits/month & 20,000 regular members
- ◆ Enormous amounts of information available (not open to public anymore)
- ◆ Run by four Army Majors (all West Point professors)
- ◆ Often the Generals do not have all the knowledge that the soldiers need (e.g. soldiers returning from Iraq can transfer their knowledge to new soldiers)
- ◆ On-line video interviews of soldiers in Iraq and Afghanistan
- ◆ Began with PHP/mySQL but now uses Tomoye Simplify

References

- ◆ Rick Wallace, V.P. of SAIC, *CoP Short Course*, Army Knowledge Management Symposium, 2003
- ◆ Etienne Wenger, Richard McDermott, and William Snyder, *Cultivating Communities of Practice*, Harvard Business School Press, 2002
- ◆ Hubert St Onge and Debra Wallace , *Leveraging Communities Of Practice For Strategic Advantage*, 2002
- ◆ Davenport, T. H. and Prusak, L., *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, 2000
- ◆ Long & Schweitzer, paper:
http://www.personal.psu.edu/lnl/papers/aiaa2004_1264.pdf
- ◆ Schweitzer seminar:
<http://www.ics.psu.edu/fallnotes/cop1.pdf>

Acronyms

- ◆ KM = Knowledge Management
- ◆ CoP = Community of Practice
- ◆ CoI = Community of Interest (often made up of numerous communities of practice, ie community of communities, Knowledge Boards)
- ◆ EIP = Enterprise Information Portal
- ◆ CMS = Content Management System
- ◆ CIC = Computing, Information, and Communication
- ◆ JACIC = Journal of Aerospace Computing, Information, and Communication