1. AGENCY USE ONLY (Leave blank)  

2. REPORT DATE  
4 February 2000  

3. REPORT TYPE AND DATES COVERED  
Executive Summary and Annotated Briefing - August 1998  

4. TITLE AND SUBTITLE  
Joint Universal Lessons Learned System (JULS) Command and Control (C2) Analysis - Summer 1998 - Executive Summary and Annotated Briefing  

5. FUNDING NUMBERS  

6. AUTHOR(S)  
Mrs. Corinne Wallshein 
Cadet Jachin Sakamoto 
Cadet Chad James  

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)  
Air Force Studies and Analyses Agency 
1570 Air Force Pentagon 
Washington, DC 20330-1570  

8. PERFORMING ORGANIZATION REPORT NUMBER  
31493  

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)  
Air Force Studies and Analyses Agency 
1570 Air Force Pentagon 
Washington, DC 20330-1570  

10. SPONSORING/MONITORING AGENCY REPORT NUMBER  

11. SUPPLEMENTARY NOTES  

12a. DISTRIBUTION AVAILABILITY STATEMENT  
This publication is Unclassified and Approved for Public Release: Distribution Unlimited.  

12b. DISTRIBUTION CODE  

13. ABSTRACT (Maximum 200 words)  
Two Cadet activities in the Summer 1998 analyzed the JULS databases for numbers and types of C2 lessons learned (LL). The first activity used an Air Force JULS database from the Air Force Center for Knowledge Sharing Lessons Learned (AFCKSSL) and charted LL by C2 categories (such as Joint Forces Air Component Commander (JFACC), Air Operations Center (AOC), Air Tasking Order (ATO), type of exercise (Blue Flag, Red Flag, Roving Sands), type of service (Army, Navy, Air Force), and training) and by Joint Chiefs of Staff (JCS) components (J1 for manning, J2 for intelligence, J3 for operations, J4 for logistics, J5 for strategy/doctrine, J6 for C2, communications and coordination, J7-J8 for structure/resources/assessment.) The second activity used a Joint Warfighting Center (JWC), Joint Center for Lessons Learned (JCLL) JULS database and charted LL by C2 Uniformed Joint Task List (UJTL) categories, assigned by JCLL. Over 35% of LL in both activities related to C2, indicating that JULS could be a future source for C2 analysis data. Changes to the LL data collected must be made beforehand to ensure that LL data can be analyzed effectively and accurately for C2 LL and for trends in C2 LL over time.  

14. SUBJECT TERMS  
C2, JULS, Joint Universal Lessons Learned System, Analyses, Operations Research, AFSAAs, Study, JWC, Joint Warfighting Center, JCLL, Joint Center for Lessons Learned, AFCKSSL, Air Force Center for Knowledge Sharing Lessons Learned, UJTL, Uniformed Joint Task List  

15. DTIC QUALITY INPACTED 1  

16. PRICE CODE  

17. SECURITY CLASSIFICATION OF REPORT  
Unclassified  

18. SECURITY CLASSIFICATION OF THIS PAGE  
Unclassified  

19. SECURITY CLASSIFICATION OF ABSTRACT  
Unclassified  

20. LIMITATION OF ABSTRACT  
UL
Joint Universal Lessons Learned System (JULLS) Command and Control (C2) Analyses - Summer 1998

Study Director:
Corinne Wallshein

February 2000
Force Analysis Division

SAMI Number: 31493

UNCLASSIFIED

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited
Title: Joint Universal Lessons Learned System (JULLS) Command and Control (C2) Analysis Summer 1998

- Do not return copies of this report unless contractual obligations or notice on specific document requires its return.

- This report is published in the interest of scientific and technical information exchange and does not constitute approval or disapproval of its ideas or findings.

- Using Government drawings, specifications, or other data included in this document for any purpose other than Government procurement does not in any way obligate the US Government. The fact that the government formulated or supplied drawings, specification, or other data does not license the holder or any other person or corporation; or convey any rights or permission to manufacture, use, or sell any patented invention that may relate to them.

- If you change your address, wish to be removed from this mailing list, or your organization no longer employs the addressee, please notify AFSAA/SAMI at:

  AFSAA/SAMI
  1570 AF Pentagon
  Washington, DC 20330-1570
Executive Summary
Joint Universal Lessons Learned System (JULLS)
Command and Control (C2) Analysis
Summer 1998

Question

In the Summer of 1998, Air Force Studies and Analyses Agency (AFSSA) employed two Air Force Cadets to evaluate JULLS as a C2 analysis data source. According to AF/XOOT, Lt Col Medvetz, a majority of exercises are designed to train and enhance C2. Our main question was “Are lessons learned a viable source for C2 analysis data?”

Customers

There were no external customers for this analysis. This analysis was internally generated by AFSSA as an attempt to mine C2 data from a joint source. During and after these activities, we coordinated with the Air Force and Joint offices handling lessons learned collection and dissemination. They helped us identify which databases to use, and they provided advice and guidance as we learned and analyzed the JULLS data. They were extremely supportive of our efforts and generously shared their experiences and knowledge of the system, processes, and data. This work culminated with a brief to AF/XOOT in December 1999. AF/XOOT informally requested AFSSA to participate and contribute to Air Force meetings in the spring of 2000 to update the lessons learned software. This may promote data collection needed for analysis, particularly trend analysis.

Scope/Limitations

Air Force Center for Knowledge Sharing Lessons Learned (AFCKSSL) under AF/XOOT provided a sample of 1300 records from 4/96 to 12/97. Joint Center for Lessons Learned (JCLL) under JCS/J7 provided 908 records categorized by the Universal Joint Task List (UJTL), which were a subset of the 13,000 entries of the JULLS database JM971. Cadet Sakamoto sorted the AFCKSSL database by Joint Chiefs of Staff (JCS) organization categories and by C2 keywords (e.g. Air Operations Center [AOC], Joint Forces Air Component Commander [JFACC]). Trend analysis was also attempted with data split over three equal time periods. Cadet James sorted by UJTL designated C2 categories (strategic, operational, and tactical) and C2 overall. Both Cadets had approximately six weeks to complete their analysis. Each of them produced a separate written report of their findings and recommendations.

Results and Aftermath

Over 35% of the records in both databases related to C2. In the current system, the user must read through the narratives. Data availability and completeness vary quite widely based on the input source(s). Currently, database fields are not designed for quantitative analysis. In order to be able to use JULLS for C2 analyses, the system needs to be structured to collect relevant C2 data. Adding short fields such as YES/NO and multiple choice would aid quantitative analysis of the lessons learned.
FINAL WORDS

JULLS databases today do not lend themselves easily to analysis. JULLS databases must be populated with more than keywords and narrative to facilitate quantitative analysis -- and the entire process should be engineered to be simple and automated. Additionally, with quantitative analysis in place, the Air Force lessons learned processes and remedial action programs can be managed more coherently.

Study Team:

Mrs Corinne Wallshein  AFSAA/SAAB
Cadet Jachin Sakamoto  Air Force Academy
Cadet Chad James  Louisiana State University

AFSAA Advisors:
Maj. Robert Morris  AFSAA/SAAB
Lt Col John Borsi  AFSAA/SAM

AFCKSSL POCs:
Mr. Ray Gutierrez  AFCKSSL Contractor (Cntr)
Mr. David Free  AFCKSSL Cntr
Mr. Steven McCoy  AFCKSSL Cntr
Mr. Randall Schmidt  AFCKSSL Cntr

AF/XOOT POCs
Lt Col James Sullivan  AF/XOOT
Lt Col Robert Medvetz  AF/XOOT
Mr. William Horton  AF/XOOT Cntr

Joint Warfighting Center
Mr. Michael Runnals  Joint Center for Lessons
Learned Cntr
This analysis was two pronged, by different Cadets, under the direction of Battle Management, Command and Control Branch in the Force Analysis Division of Air Force Studies and Analyses Agency (AFSAA). Cadet Jachin Sakamoto was a rising fourth class member at the U.S. Air Force Academy, from Hawaii. Cadet Chad James was a rising fourth class ROTC member at Louisiana State University, from Kansas.

The analysis director was Mrs. Corinne Wallshein, AFSAA/SAAB. An earlier version of this brief was reviewed by analysts in AFSAA, AF/XOOT, Joint Warfare Center's Joint Center for Lessons Learned, and the Air Force’s Center for Knowledge Sharing, Lessons Learned.

The following personnel were responsible for this analysis brief:

Mrs. Corinne Wallshein  AFSAA/SAAB
Cadet Jachin Sakamoto  AFA
Cadet Chad James  ROTC, Louisiana State University
The Cadets were asked to sort and count the lessons learned in the database by C2 category. They were then requested to evaluate the databases as a C2 data source for trend analysis and other C2 analyses.

CJCS 3150.25 establishes reporting policies and general responsibilities for the management of the Joint After Action Reporting System (JAARS). It applies to the Joint Staff, combatant commands, Services, Combat Support Agencies (CSAs), Defense agencies responsive to the Chairman of the Joint Chiefs of Staff, and OSD. Further, it applies to both the operational and training environments of the Armed Forces. JAARS is the formal process for the collection and dissemination of observations, lessons learned, and issues generated from joint operations and exercises. All operations precipitated by an executive order or deployment order from the National Command Authority (NCA) require a complete JAAR. All CJCS exercises in the CJCS Joint Training Master Schedule (CJCSN 3501) or the Quarterly Schedule of Significant Military Exercises (CJCSN 3502) require a JAAR. The type of report for joint training events is determined by the combatant commander during the Joint Annual Training Plan submission. There are three types of reports: a complete JAAR; an abbreviated JAAR; and a cancellation report. Lessons learned databases, reporting in the Joint Universal Lessons Learned System (JULLS) begin with a user generated JAAR report. A JAAR may consist of a summary and multiple lessons learned, issues, key observations and assessments. JAAR components are entered into JULLS databases.
JULLS was congressionally mandated so the military could learn from past mistakes and, hopefully, not repeat them. The Joint Chiefs of Staff J7 office is responsible for managing all the lessons learned, and to collect, analyze, distribute, and preserve JULLS, they set up JCLL at JWFC. The Air Force took a centralized control / decentralized execution theme in managing JULLS. AF/XOOT oversees AFCKSLL which was established in October 1997 at Langley Air Force Base (AFB), Virginia. AFCKSLL’s vision is to create an environment within the Air Force where knowledge sharing is a “normal” practice at all levels of command. And, in order to share knowledge, we first have to acquire it. More data does not translate into more knowledge directly. There’s a process to convert data into information, and then into knowledge. This process requires tremendous manual effort and diligence since LL are primarily narrative and, usually, highly subjective. None of the LL data is cataloged or categorized other than by type of LL and level of security classification. Data collection contributes to the problem of too much data and too little knowledge. Analysis is done by reading the narratives and mentally evaluating the LL, then conveying those findings verbally and/or in writing to others.

There are three types of JULLS. (1) The LL includes lessons learned, issues, and observations. It records a specific lesson learned or an issue noted. It is the most common type of JULL. It contains one or more UJTL Task(s) linked to the LL. (2) The summary JULL is mandatory. It provides an overall picture of the exercise of operation objectives and documents the facts of the event. It contains the Joint Mission Essential Task List (JMETL) tasks as one or more of the UJTL task. (3) The Assessment JULL is optional. It reports the degree of success obtained. It is usually from CC, staff, evaluators, or trainers. It is a complete appraisal of each objective and each UJTL based JMET.
Background: Who’s who?

- JCS/J7 established Joint Warfighting Center’s Joint Center for LL (JCLL) at Fort Monroe
- AF/XOOT established Air Force Center for Knowledge Sharing LL (AFCKSSL) at Langley AFB
- Other Services have LL systems
  - Center for Army LL at Fort Leavenworth
  - Navy LL System at Naval Warfare Development Command Doctrine Development Division at Newport
  - Marine Corp LL System at Marine Warfighting Development Integration Division of MCCDC at Quantico

These agencies are responsible for collecting, processing, exploiting, and disseminating LL. With the implosion of web based technology, there’s lots of LL on the Internet and SIPRNET, available for personnel to leaf through with key word searches.

Collecting Lessons Learned (LL) is a requirement for all Services. There are various databases of LL on web sites easily accessible to the defense community. A sampling is below:
- ACC Center for Lessons Learned -- http://157.214.212.52/samples/search/query.htm
- AFCKSSL Internet Database -- http://131.6.216.21
- AFCKSSL SIPRNET Database -- http://157.214.212.51
- Joint Staff JULLS Database is at:
  - EUCOM Center for Lessons Learned Command Data Base Search Engine is at:

There are many JULLS databases. Each CINC has a command database for internal use. There were three joint staff level JULLS databases. Two resided at JCLL: the archived and the current database. The third database is the Remedial Action Program (RAP) database at JCS/J7’s Evaluation and Analysis Division (EAD). Both JCLL and AFCKSSL had several data bases. We chose one from each organization: the AFCKSSL was the basis for Cadet Sakamoto’s analysis and the JCLL database was the basis for Cadet James. Our efforts were geared to examining JULLS for C2 lessons learned. This was done by first selecting the database, reading the narrative entries, sorting the entries into categories of C2 and/or exercises, attempting trend analysis on the JULLS, and then suggesting what might be done to JULLS to make it easier to analyze.
Background: AF LL status

- Ad hoc LL exploitation
- No standard impact on AF performance reviews
- GAO Report, Aug 95, Military Training: Potential to Use LL to Avoid Past Mistakes is Largely Untapped true in 1998 according to AFCKSSL
- AF web based LL collection and dissemination
  - Full text search or keyword search possible
  - Challenge to inject past LL into planned exercises and operations
- AF member of CJCS Remedial Action Program
  - Only Joint Staff JULLS corrective action program
  - Formal Service requirement in CJSUI 3150.01

Currently, in the AF, LL exploitation is labor intensive and ad hoc. Whether you do a thorough job of filling out JAARS or not, whether you read through past LL or not, and whether you are aware of LL system or not has no standard impact on your individual or unit performance review(s).

1995 GAO findings were: Marine Corps, Air Force, and Navy do not: (1) include all significant information from training exercises and operations in their LL programs; and (2) analyze their LL information to identify trends in performance weaknesses. For the most part, the dissemination of LL information is adequate. However, the Air Force does not make this information readily available to all potential users. AF’s decentralized LL databases are maintained at each major command’s headquarters and therefore are not easily accessible to units throughout the AF. GAO recommends that the Secretary of Defense direct the Secretaries of the Air Force and the Navy, the Chairman of the Joint Chiefs of Staff, and the regional commands in chief, as appropriate, to (1) establish controls to ensure that all significant LL information collected from combat training centers, fleet exercises, and other major training exercises are recorded in LL databases; (2) analyze LL information so that trend data can be developed to identify recurring problems; (3) provide training to key personnel in the use of LL information; and (4) incorporate effective validation procedures, such as testing corrective actions in joint training exercises, into LL programs. AF’s LL program is the only one of the services’ programs that is decentralized. As a result, each of the AF’s six major operational commands is responsible for developing and managing its own LL program. AF regulations do not require that the commands’ programs be uniform, so each command can take different approaches to operating its program. The programs were designed to account for, act on, and share LL information throughout the command, but not throughout the AF. The AF also operates a limited LL program at its headquarters. This program, staffed by two people, addresses LL information that results only from the AF’s participation in joint exercises or operations or that affects more than one of the major commands’ missions. AF LL managers at one major command were not successful in obtaining after-action reports covering units’ participation in various exercises and operations. Conversely, another AF major command had established a process to monitor the submission of after-action reports by subordinate units. A 1993 AF LL report on Operations Restore Hope stated that: “Almost every problem occurring during Operation Restore Hope has already been documented in JULLS as a result of previous exercises and contingencies. There appears to be a continuing trend of failure to fix problems already known [sic] to exist. We end up paying again to achieve the same undesirable results.” Lessons are not routinely analyzed to identify recurring deficiencies.

AFCKSSL consolidating AF inputs on world wide web and SIPRNET. Searches on text and key words is simple, whereas analysis requires considerably more effort. CJSUI 3150.01 describes CJCS Remedial Action Program and spells out service requirements to designate coordinators at the action officer and planner levels. AF/XOOT has this responsibility.
Methodology

- Examine databases for C2 LL
  - AFCKSSL provided 1300 records from 4/96 to 12/97
    - Sorted by JCS organizational categories (J1- J8)
    - Sorted by C2 keywords (e.g. AOC, JFACC, ATO, Exercises)
    - Trend analysis attempted on time sequenced segments
  - JCLL provided 908 records validated by the CINC's
    - Considered true lessons learned dating from 1991 and including Operation Just Cause
    - Data categorized by Universal Joint Task List (UJTL)
      - Sorted by C2 strategic, operational and tactical categories
      - Analyzed proportion of C2 in UJTL categories

Databases contain a great deal of narrative, subjective information. The quality and usefulness of this information ranges from good to not so good. A considerable part of the work done by AFCKSSL and JCLL for their clients involves qualitative, subjective analysis and synthesis using previous military experience and professional judgment.

Cadet Sakamoto used a JULLS database from AFCKSSL containing approximately 1283 records and spanning a time period from 25 April 1996 to 5 December 1997. While the entire JULLS database programs has over 20,000 records, this analysis utilized a sample database for two reasons: (1) A smaller sample was easier and faster to query; (2) Additional records were difficult to obtain and import into Microsoft Access. Several attempts were made to provide key word search query capabilities on the world wide web and SIPRNET by organizations such as USEUCOM and ACC. Most of the INTELINK sites, which allow actual downloading of JULLS databases only provide the ASCII/text format, were difficult to manipulate. Other sites only allowed viewing on a file by file basis.

Cadet James used a JULLS database from JCLL containing 908 records, 810 of which were linked to one or more task in the UJTL. They were a subset of over 13,000 entries in a JULLS database called JM971. Records consisted of summaries, assessments, lessons learned, issues and key observations. In the JCLL Bulletin, CCTI 96-3, on C2 of Joint Air Operations, JCLL retrieved the following UJTLs: OP 1.5.3 -- Gain and maintain air superiority in theater of operations/JOA; OP 3.1.2 -- Assign Joint/Multinational operational firepower resources; OP 6.1.3 - - Provide aerospace control. They discussed three topics: (1) Implementation of a JFACC; (2) Production of the Air Tasking Order; (3) Component coordination. They did not use Section 5, titled Command and Control, in the UJTL. Cadet James concentrated solely on Section 5.
A topical approach was used here to address:

- Procedures such as the ATO and training
- Organizations and Offices such as the AF, Army, Navy, Marines, AOC and JFACC
- Exercises such as Roving Sands, Blue Flag and Red Flag.

This approach seemed to be exclusive. It failed to include a majority of the records, though this could be handled by increasing the number of categories.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SIZE</th>
<th>PERCENTAGE</th>
<th>KEY WORDS USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>View AOC</td>
<td>58</td>
<td>4.52%</td>
<td>AOC, Air Operations Center</td>
</tr>
<tr>
<td>View Air Force</td>
<td>103</td>
<td>8.03%</td>
<td>Air Force, USAF</td>
</tr>
<tr>
<td>View Army</td>
<td>83</td>
<td>6.47%</td>
<td>Army</td>
</tr>
<tr>
<td>View Navy</td>
<td>32</td>
<td>2.50%</td>
<td>Navy, USN</td>
</tr>
<tr>
<td>View Marine Corps</td>
<td>16</td>
<td>1.25%</td>
<td>Marine, USMC</td>
</tr>
<tr>
<td>View Blue Flag</td>
<td>18</td>
<td>1.40%</td>
<td>Blue Flag</td>
</tr>
<tr>
<td>View Red Flag</td>
<td>3</td>
<td>0.23%</td>
<td>Red Flag</td>
</tr>
<tr>
<td>View JFACC</td>
<td>35</td>
<td>2.73%</td>
<td>JFACC, Joint Force Air</td>
</tr>
<tr>
<td>View JSTARS</td>
<td>7</td>
<td>0.55%</td>
<td>STARS, eagle, Joint Surveillance Target Attack System</td>
</tr>
<tr>
<td>View Roving Sands</td>
<td>112</td>
<td>8.74%</td>
<td>Roving Sand</td>
</tr>
<tr>
<td>View ATO</td>
<td>186</td>
<td>14.51%</td>
<td>tasking order, ATO</td>
</tr>
<tr>
<td>View Training</td>
<td>443</td>
<td>34.56%</td>
<td>training, exercise, simulation, scenario</td>
</tr>
<tr>
<td>Records Not Included</td>
<td>649</td>
<td>50.6%</td>
<td></td>
</tr>
</tbody>
</table>
The database was sub-categorized by the different Joint Staff components, J1 through J8. The reasoning behind this approach was each of the Joint Staff components could pick out problems that pertain to their field. Although this approach may uncover major issues to be addressed at the strategic level, many of the issues and recommendations in the AF JULLS database were directed at the operational level. Each sub-categorization was limited to a keyword search. The entire text portion of each record was searched and depended upon the word used by personnel in the data entry stage of the database. The following key word list was generated by Cadet Sakamoto after he had read through a sample of the database to glean an understanding of the common terminology in the records. As shown, J1, J3 and J6 have the most entries. One could infer that J1, J3, and J6 have the most problems.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>SIZE</th>
<th>PERCENT</th>
<th>KEY WORDS USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1 - Manning</td>
<td>452</td>
<td>35.26%</td>
<td>Manning, Personnel, manpower, deployed, manned</td>
</tr>
<tr>
<td>J2 - Intel</td>
<td>226</td>
<td>17.63%</td>
<td>intel, intelligence, data, surveillance, tracking, targeting</td>
</tr>
<tr>
<td>J3 - Operations</td>
<td>338</td>
<td>26.37%</td>
<td>operations, ops</td>
</tr>
<tr>
<td>J4 - Logistics</td>
<td>96</td>
<td>7.49%</td>
<td>Logistics, log</td>
</tr>
<tr>
<td>J5 - Strategy</td>
<td>34</td>
<td>2.65%</td>
<td>strategy, doctrine, policy, regulation</td>
</tr>
<tr>
<td>J6 - C2</td>
<td>63</td>
<td>4.91%</td>
<td>C2, C3, C4, command and control</td>
</tr>
<tr>
<td>J6 - Communication</td>
<td>392</td>
<td>30.58%</td>
<td>Communication, phone, radio, interface, computer, net, link</td>
</tr>
<tr>
<td>J7 - Coordination</td>
<td>166</td>
<td>12.95%</td>
<td>coordination, aligned, synchronization, conflicting, different databases, integration, interoperability</td>
</tr>
<tr>
<td>J8 - Assessment</td>
<td>102</td>
<td>7.96%</td>
<td>structure, resources, assessment</td>
</tr>
<tr>
<td>Records Not Included</td>
<td>1</td>
<td>0.08%</td>
<td></td>
</tr>
<tr>
<td>TOTAL:</td>
<td>1869</td>
<td>100%</td>
<td>145.79%</td>
</tr>
</tbody>
</table>
An attempt was made to analyze the communications, coordination, and C2 categories by time to discover recognizable trends. The goal behind this analysis was to show that the quantity of problems in certain areas decreased over time -- suggesting that the military was learning from its mistakes. The data was divided into three approximate six month sections, the last section being slightly larger than the other two. The time frames were: 4/26/96 to 10/26/96; 10/26/96 to 4/26/97; and 4/26/97 to 12/5/97. The bar charts show actual record counts and percentages in relation to the number of records contained in each period. While these results are inconclusive and no trends are evident, additional data covering a larger time frame may be more revealing. Data entries come in spikes following exercises and operations. Larger time sections would allow the data in each section to be more normalized in relation to other sections.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>NUMBER</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C2</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Communication</td>
<td>72</td>
<td>144</td>
</tr>
<tr>
<td>Coordination</td>
<td>4</td>
<td>94</td>
</tr>
<tr>
<td>Pure C2</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Pure Communication</td>
<td>71</td>
<td>100</td>
</tr>
<tr>
<td>Pure Coordination</td>
<td>3</td>
<td>55</td>
</tr>
<tr>
<td>Overlap C2 &amp; Comm</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Overlap Comm &amp; Coord</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td>Overlap Coord &amp; C2</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Overlap C2, Comm &amp; Coord</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>
Joint database C2 distribution

42% relate to C2

344 C2 related records out of 810 categorized by UJTL, out of 908 total

When Cadet James sorted UJTL Section 5 Command and Control records out of the total, he counted 344 records. 344/810 is 42.47% Therefore, at least 42% of the records in the database relate to C2.

In Cadet Sakamoto’s Joint Staff categorization, where J6 had the key words of C2, C3, C4, command and control, communication, phone, radio, interface, computer, net, and link, there were 455 records out of 1282. Using the key words of C2, C3, C4, and command and control for J6’s C2, there were 63 records. Using the key words of communication, phone, radio, interface, computer, net, and link for J6’s communication, there were 392 records. Total J6 categorization came to 455 records. Though there was undoubtedly double counting, the total percentage of 455/1282 is 35.49%.
The UJTL records were sorted into several section 5 categories, namely:

- Section 5.1 -- Operate and Manage Communications and Information at the appropriate level (There are four levels: SN is Strategic National; ST is Strategic Theater; OP is Operational; and TA is Tactical)
- Section 5.4 -- Provide Direction to Forces at appropriate level
- Section 5.5 -- Organize Joint Headquarters
- Section 5.7 -- Coordinate and Integrate Joint/Multinational Interagency Support
- Section 5.8 -- Provide Public Affairs in Theater of Operations/Joint Operations Area (JOA)

The 309 records broke out into the following levels:

- SN -- 49
- ST -- 87
- OP -- 167
- TA -- 6

These numbers translate into the percentages shown in the pie chart.
This slide provides a snapshot of the total distribution of 309 C2 related records, shown in the center pie chart, together with the percentages in the three UJTL levels of warfare: Strategic National (SN), Strategic Theater (ST), and Operational (OP). The box at the bottom of the slide summarizes the difference between the warfare levels.

The percentage of LL linked to OP 5.1, Operate and Manage Communications and Information at the Operational Level, is less than that SN 5.1 and ST 5.1, Operate and Manage Communications and Information at the Strategic Level. The percentage of LL linked to OP 5.4, Provide Direction to Forces at the Operational Level, is less than SN 5.4 and ST 5.4, Provide Direction to Forces at the Strategic Level.

The percentage of LL linked to OP 5.5, Organize Joint Headquarters, and OP 5.7, Coordinate and Integrate Joint/Multinational Interagency Support, is much greater than similarly numbered UJTL strategic tasks.
The records sorted out as follows:

<table>
<thead>
<tr>
<th>UJTL</th>
<th>Description</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN 5.1</td>
<td>Operate/Manage Global Strategic Communications and Information System</td>
<td>28</td>
<td>50%</td>
</tr>
<tr>
<td>SN 5.4</td>
<td>Provide Strategic Direction to Forces Worldwide</td>
<td>21</td>
<td>37.5%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>7</td>
<td>12.5%</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>56</td>
<td>100%</td>
</tr>
</tbody>
</table>

All C2 records totaled 344, so the percentage related to Strategic National is 56/344 = 16%.
## UJTL Strategic Theater C2

- 28% related to Strategic Theater

### Strategic Level - Theater Tasks

<table>
<thead>
<tr>
<th>Description</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operate/Manage Theater Communications and Information Systems</td>
<td>34</td>
<td>35%</td>
</tr>
<tr>
<td>Prepare and Plan Orders</td>
<td>15</td>
<td>16%</td>
</tr>
<tr>
<td>Provide Strategic Direction</td>
<td>38</td>
<td>39%</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>10%</td>
</tr>
</tbody>
</table>

**TOTAL**  
97 100%

94/344 = 28%
### UJTL Operational C2

- **54% related to Operational C2**

**Operational Level Tasks**

- Acquire & Communicate Operational Level Info & Maintain Status
- Command Subordinate Operational Forces
- Organize Joint Force HQ
- Coordinate & Integrate Joint / Multinational & Interagency Support
- Provide Public Affairs in Theater of Operations/JOA
- Other

<table>
<thead>
<tr>
<th>UJTL</th>
<th>Description</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP 5.1</td>
<td>Acquire and Communicate Operational Level Information and Maintain Status</td>
<td>40</td>
<td>22%</td>
</tr>
<tr>
<td>OP 5.4</td>
<td>Command Subordinate Operational Forces</td>
<td>22</td>
<td>12%</td>
</tr>
<tr>
<td>OP 5.5</td>
<td>Organize Joint Forces Headquarters</td>
<td>60</td>
<td>32%</td>
</tr>
<tr>
<td>OP 5.7</td>
<td>Coordinate and Integrate Joint/ Multinational and Interagency Support</td>
<td>22</td>
<td>12%</td>
</tr>
<tr>
<td>OP 5.8</td>
<td>Provide Public Affairs in Theater of Operations/JOA</td>
<td>17</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>24</td>
<td>13%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>185</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

185/344 = 54%
Both Cadets found that approximately 40% of the LL related to C2.

The user must read through the narratives to get a feeling for what’s in the databases. The data availability and completeness varies by records within the same database and between databases. The only required short field is classification level. The databases from JCLL and AFCKSLL used specially developed software to view the records. This specially developed software did not allow for easy import into ACCESS which complicated the Cadets’s job of counting, sorting, and evaluating the data.

When we spoke with JCLL personnel, we learned that they were working on database inputs and formats and they were institutionalizing the process of sharing LL with testing and exercise personnel. Their approach was to grow their staff to read through and summarize the pertinent data to present to the testing and exercise personnel. I have a copy of their TRAIL BLAZER report.

At AFCKSLL, they were working on a web-based input and search database. They wanted to make the LL easily available to AF personnel. They did not have the staff and did not have plans to significantly grow the staff to internally read, process, summarize, and disseminate the summaries of AF LL.

The way to make it easier to learn lessons is to change the input process so the retrieval process is less manually intensive. It would make quantifying LL easier, it would make it easier to convert data into information and then into knowledge, and it would make disseminating the knowledge easier.
...never feel badly about making mistakes as long as you take the trouble to learn from them...but it’s not just learning things that’s important. It’s learning what to do with what you learn and learning why you learn at all that matters.” The Phantom Tollbooth, by Norman Juster, 1961, page 233.

One of the most glaringly obvious recommendations of this work was to restructure the JULLS inputs. If there were more quantifiable fields in the LL databases, then JULLS would be easier to quantify. This corresponds to adding Yes/No (Y/N) fields and multiple choice fields based on subjective inputs.

Another recommendation was to expand LL sharing of relevant LL. This recommendation includes the work it will require from our senior leaders to make LL relevant: communicating the importance of inputting LL, linking the quality of LL input to individual and unit performance ratings, and informing the AF of the status of RAP from LL.

Finally, once we have quantifiable fields in the database records and collect them, then we have a built a body of data for trend analysis and other analyses. The AF will be empowered to achieve the following: “We hope to share with the community the lessons we have learned so that our successes can be exploited instead of relearned and so our failures can be avoided instead of recommitted.” Modeling for Campaign Analysis: Lessons for the Next Generation of Models, Executive Summary, by Richard J. Hillestad, Bart Bennett, and Louis Moore, Rand Corporation, 1996, page 5.
Recommendations

- Plan to use JULLS in quantitative analyses
  - Restructure JULLS
    - Survey defense community for needed analysis info
    - Change collection process to get relevant data
    - Add survey fields that are Y/N and multiple choice
  - Expand lessons learned sharing
    - Communicate with AF
      - Emphasize importance of data input
      - Educate AF personnel
      - Link LL processes with performance reviews
      - Report widely on Remedial Action Program
    - Gather quantitative C2 data & metrics from JULLS
      - Share data and metrics with AF
      - Analyze using various techniques, including trend analysis

One of the most glaringly obvious recommendations of this work was to restructure the JULLS inputs. If there were more quantifiable fields in the LL databases, then JULLS would be easier to quantify. This corresponds to adding Yes/No (Y/N) fields and multiple choice fields based on subjective inputs.

Another recommendation was to expand LL sharing of relevant LL. This recommendation includes the work it will require from our senior leaders to make LL relevant: communicating the importance of inputting LL, linking the quality of LL input to individual and unit performance ratings, and informing the AF of the status of RAPs from LL.

Finally, once we have quantifiable fields in the database records and collect them, then we have a built a body of data for trend analysis and other analyses. The AF will be empowered to achieve the following: "We hope to share with the community the lessons we have learned so that our successes can be exploited instead of relearned and so our failures can be avoided instead of recommitted." Modeling for Campaign Analysis: Lessons for the Next Generation of Models, Executive Summary, by Richard J. Hillestad, Bart Bennett, and Louis Moore, Rand Corporation, 1996, page 5.