



IMPROVING AMC AFTER ACTION REPORTS: WHAT IS THE STANDARD?

GRADUATE RESEARCH PAPER

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Abstract

The strength of institutional learning can be a source of competitive edge within organizations. Within the Air Force's Air Mobility Command, one of the ways the organization learns is through a lessons learned program. The lessons learned program collects information to fuel lessons learned through After Action Reports. However, the process governing AARs and the connection to lessons learned processes suffers from a variety of factors that prevent the full realization of value. After Action Reports could provide more benefit if they were standardized, available, analyzed, and lessons learned applied from them. This paper examines the current AMC process through the framework of standardization, availability, analysis, and application, all influenced by human behavior, to create a successful After Action Report. A survey research method consisting of a questionnaire and semi-structured interview was executed, and content analysis was performed on the results. Analysis revealed although standardization is desired, flexibility is equally needed. After Action Reports are mostly unavailable to inquiring parties, and feedback loops are rarely closed to inform contributors of any analysis conducted, preventing lessons learned from being applied. Recommendations are to offer a standardized After Action Report template with information categories based on the results of this study, invigorate the AMC lessons learned program by establishing definitive guidance and commanders' priorities, establish a report repository, and evaluate the HQ AMC lessons learned coordination via continuous process improvement.

Acknowledgments

I would like to express my sincere thanks to my research advisor, Col Jason Anderson, for all the guidance and advice provided in this project. He helped me think critically about all aspects of the endeavor and communicate them effectively. I'd also like to thank my research sponsor at Air Mobility Command, Mr. Harold Rice. His insight and vectoring were valuable in shaping the direction of the study. Finally, my wife and children deserve sincere thanks for the amount of time they allowed me to devote to this project when they could have used my attention.

Brett J. Messer

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IMPROVING AMC AFTER ACTION REPORTS: WHAT IS THE STANDARD?

I. Introduction

Background

Learning in organizations is essential to growth and continued success. Imagine working on a team or company that perfectly captured performance feedback and lessons learned, and applied them to continuously refine goals, procedures, and measures of success. Continuous learning within organizations breeds better performance. Performance feedback is essential to this learning (Morrison & Meliza, 1999). When it is not done correctly, poor knowledge retention and transfer, and other difficulties ensue (Mastaglio et al., 2011). After-Action Reports (AARs), and other methods and products known by similar names, aim to capture lessons learned from a wide range of events. These events can be exercises, military operations, disaster responses, simulations, or training; the possibilities are nearly endless. AARs capture learning opportunities. Unfortunately, many organizations' lessons learned programs and AARs fail to meet their established intent to facilitate learning (Donahue & Tuohy, 2006). But when accomplished correctly, some versions of After Action Reviews, AARs, or other lessons learned programs have been shown to increase performance by those parties that use them by nearly 20-25% (Tannenbaum & Cerasoli, 2012).

The failure to learn is due to several factors. Some of those factors as applicable to the Mobility Air Forces (MAF) were explored by Maj Ryan Wells in 2021 with his paper "Don't Waste My Time: Improving the MAF After-Action Report." During that research, he revealed a gap between written AARs and their desired end value. In summary, he posits to produce a successful AAR with full process commitment, it must be standardized, available, capable of

analysis, and application derived from it. Figure 1 shows his framework for a successful AAR.

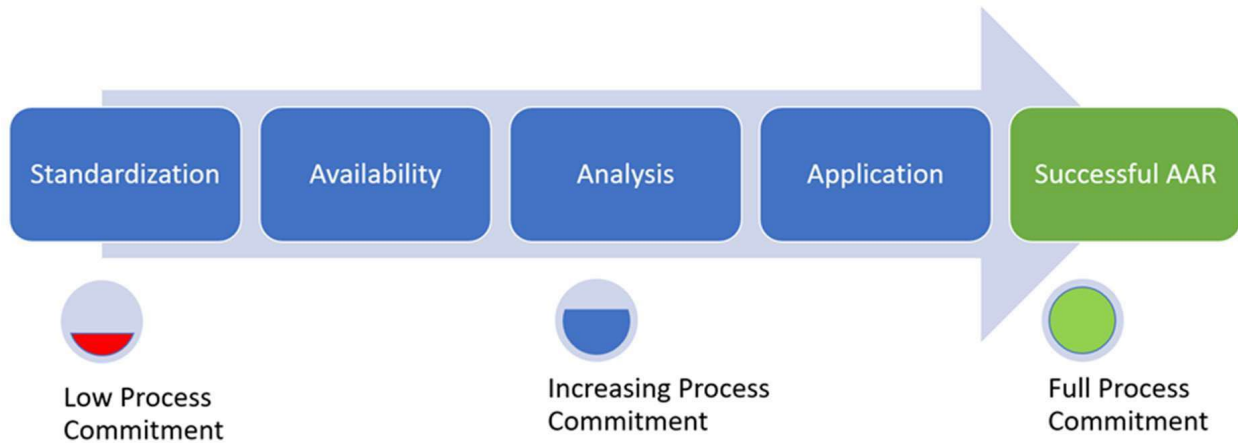


Figure 1. AAR Process Framework

His research indicates the current MAF AAR process does not produce standardized and available information, capable of analysis and application. If the literature shows there is value in a robust lessons learned program, the question for the MAF, and Air Mobility Command (AMC) in particular, is: how can we close the gaps keeping it from being a successful program?

The author of this report has similar personal experience with poor quality lessons learned programs. Typically, after a military exercise or significant event, participants will be directed to “log their lessons learned” or write a formal AAR. From the action officer’s perspective, this can often result in hastily written or “pencil-whipped” products to satisfy the requirement. The lessons learned or AARs are then submitted and filed into an unknown or poorly documented system of record and never heard from again. This weak process dooms the participants to repeat many of the same mistakes that had been previously captured as “lessons learned.”

This is an important effort because military service members in the field are writing AARs that may never be read or referenced again, resulting in wasted effort. Additionally, the way AARs are submitted and filed presently do not allow for robust analysis and must be

individually read to pull out data (Wells, 2021). Standardizing the current process and making the data available to all stakeholders and capable of analysis gives AMC the ability to capture lessons learned from various events as opposed to simply “lessons observed.”

Research Questions

If learning is essential to organizational success, and feedback is critical to learning and improving performance, then programs that institutionalize and hone feedback tools like AARs should be pursued. In pursuit of improving AMC AARs this paper addresses the following research questions:

R.Q. 1: How can AMC AARs be standardized?

R.Q. 2: How can AMC AARs be constructed to allow longitudinal and trend analysis?

This paper addresses the above research questions through a qualitative research study, consisting of a survey method through questionnaire and semi-structured interviews. The project builds on research conducted by Maj Ryan Wells to enhance the value of AMC AARs, specifically through standardizing and investigating types of content for analysis, enabling more meaningful analysis and application (Wells, 2021).

II. LITERATURE REVIEW

Overview

The United States Army is credited with the creation of the After Action Review (separate from “Report”) in the 1970s (Morrison & Meliza, 1999). This specific U.S. Army technique is an in-person review conducted with post-event participants to study what happened and what lessons could be learned (Morrison & Meliza, 1999). The original concept was to cement learning by giving instant feedback immediately following the completion of an event (Kaliner, 2013). In the last 40 years, other governmental entities and private industry have adopted and adapted versions of the U.S. Army’s After Action Review to suit their own needs. While the Army still conducts in-person facilitated reviews as a standard operating procedure, other versions of this process involve documenting lessons learned for further review and analysis, which is the method of primary focus in this paper. Despite the value people recognize in AARs, organizations repeatedly fail to learn crucial lessons captured in the reports (Donahue & Tuohy, 2006). The problem is that the programs are called “lessons learned,” but a lesson is not learned until the application phase has been completed. Experience suggests these are not really “learned” lessons since problems and mistakes are often repeated in subsequent events, and simply going through AAR motions is not enough to achieve true learning (Donahue & Tuohy, 2006). If it were possible to create a repository of AAR material and use electronic measures to review large data samples, the content analysis could be accelerated (Morrison & Meliza, 1999).

Every time the military conducts an exercise, executes a deployment or operation, or engages in humanitarian action, the event yields an opportunity to test performance and then determine ways to improve the next cycle (Ross et al., 2008). Using these reports to capture

lessons learned is for the benefit of future generations of planners and warfighters, so they can benefit from a well-documented history (Jagears, 2020). Providing feedback, improving performance, and enhancing readiness are all part of continuous quality improvement in aspects of military training, vital to the nation's defense (Bliss et al., 2011; Ross et al., 2008).

Standardization

The value of standardization comes from the ease of processing and giving multiple entities the ability to work from and understand a common frame of reference for differing material, creating a better opportunity for analysis (Davies et al., 2019; Sawyer & Deering, 2013; Wellman, 2007). Standardization of AARs or lessons learned across all using communities varies greatly. Some organizations have internally standardized templates or minimum required information for AARs, while some do not. There is no universally accepted approach within the discipline as to the development or content of reports (Donahue & Tuohy, 2006). However, most agree there should be a minimum standard for all products (Salter & Klein, 2007). In some cases, there has been such little standardization that within a single organization, different AARs would be generated after the same incident with wildly different content and formats, making it very difficult to deconflict what is in them and even harder to validate the findings (Donahue & Tuohy, 2006).

If there is no system integration or standardization, it does not facilitate the use or the building of any corporate knowledge or lessons learned; there is no foundation or framework (Jugdev, 2012). When members of the organization have a clear, structured process to follow to capture feedback and lessons learned, then learning becomes encouraged and much easier (Tannenbaum & Cerasoli, 2012). Standardization enables root cause analysis, link of cause and

effect relationships, commonly understood consequences of failures, and best practices, all of which have great utility in improving performance (Nussbaum, 2016).

The Department of Homeland Security has taken steps to standardize its Security Exercise and Evaluation program to make intelligence information sharing consistent across jurisdictions, thereby enabling a common frame of reference with a shared language (Piplai et al., 2020). Similarly, while over time, the U.S. Army has codified After Action Review processes into manuals and other instructions, for some time, there was just a soft agreement about what the reviews should entail and how they should be conducted, and there was no standardization across units (Morrison & Meliza, 1999). Standardizing the approach and products reduced trainer and evaluator work time and made it easier to link training conducted across a broad spectrum of operations, leveling the field across the command and different rotations through training centers (Morrison & Meliza, 1999). Lack of standardization generates confusion, and it is more difficult to show trends among similar organizations; lessons learned collections then have less utility as a data source (Nussbaum, 2016).

However, one must be careful not to over-standardize or do it needlessly. While standardization provides the aforementioned benefits, more standardization means less flexibility (Prince, 2005). Standardizing products and information gathering can help organizations that may be struggling with data capture or getting a program off the ground. Yet forcing a standard across all organizations could hamstring personnel and units who already have an effective local solution that works particularly well for them (Prince, 2005). If a team needs the flexibility to customize and evolve processes on their own to best suit their own needs, it will be tough for them to operate in a highly standardized method (Tenedez et al., 2018).

Availability

Wells noted in 2021 that AARs in the MAF were ineffective teaching mechanisms partially due to the fact they were inaccessible to personnel who could benefit from their review. People experienced a lack of access, stove-piping within operational communities, lack of knowledge on where to access AARs, and reliance on direct emails and personnel queries for dissemination of the information (Wells, 2021). But availability is not just a problem within the MAF.

Calls for nationwide capability in gathering and validating lessons learned from major events have been made before (Donahue & Tuohy, 2006). Any electronic tool put into practice to meet this need must be easy to use; the input and extraction of data need to be simple (Jugdev, 2012). Lack of accessibility and low employee awareness can lead personnel to be unaware of or participate in broad lessons learned review, which leads to inadequate feedback loops and stifling learning (Ross et al., 2008). There are demonstrated needs for AAR repositories, consisting of compiled post-event reviews of successes and failures. The information should be indexed by data fields or tags...a powerful capability across professional disciplines; public health, emergency management, private industry, or military (Savoia et al., 2012). Once the systems are built, given time and use, there would be a bank of AAR data to draw from, enabling experts to see common themes and analyze trends, enhancing future performance (Piplai et al., 2020).

Having an accessible system full of relevant AAR data would be a significant aid to organizations with high turnover rates, saving and logging lessons learned, and best practices that survive the frequent changeover of personnel (Jugdev, 2012). This system should be cloud-based with minimal restrictions on who has 'read' access, easy to use and easy to find, and searchable to retrieve information on specific entries. Organizations still reliant on email or

direct interpersonal communication to distribute lessons learned will find themselves outclassed by faster-moving competitors (Ross et al., 2008). The more accessible the system is, the more individuals will review the same reports and interpret the data, allowing the uncovering of perception bias and more well-rounded insights, including peer review processes (Davies et al., 2019).

The lack of availability could be the result of conscious choice and not a by-product of stove-piping, lack of knowledge, or personnel negligence. As information becomes more available, it potentially becomes less secure. The more connections are offered to a product, and the more people know about it, the risk of security breaches or asset misuse can increase (Mendez Mena et al., 2018). Organizations must balance the need for the availability of information with the security of the same information. It is possible for the information to be so tightly controlled and secure that the right people do not have access to see what they need to see when they need to see it (Albrechtsen, 2015).

Analysis

Analysis can begin once AARs are in hand and the data is gathered. Analysis conducted on multiple reports in a series or cross-functionally could reveal valuable trends (Piplai et al., 2020). The reports are valuable because each product can be analyzed on its own and as a single data point among a larger collection (Stoto et al., 2019).

While the U.S. Army created After Action Reviews to analyze the actions and decisions of its soldiers, other governmental and non-governmental organizations use a version of that process or other methods of reviewing performance and behavior. Among others, the humanitarian response community, often working in concert with the United States military,

adopted the practice of using AARs for organizational learning in disaster relief efforts (Stoto et al., 2019).

The public health community has noted similar difficulty with capturing lessons learned and applying them to future problems. Instituting formal processes to analyze past events for lessons learned and capturing them via written AARs has generated some benefits (Savoia et al., 2012). Using root cause analysis and writing the reports with specific and detailed entries has proven to be a valuable learning tool (Savoia et al., 2012). Additionally, post-simulation debriefing (modeled from After Action Reviews) has revealed great value in the process. It encourages reflection on performance, which is a key component of the experiential learning cycle (Sawyer & Deering, 2013). In disaster preparedness and emergency management, AARs are widely considered a best practice already (Nussbaum, 2016).

Firms within the cybersecurity industry have used AARs to analyze methods of malware attack to visualize holistic pictures of exactly what happened after events. After analysis of reports and debriefs, teams take the lessons and apply them to modify defensive approaches to prevent and combat future attacks on the infrastructure (Piplai et al., 2020). Over time, the collection of multiple AARs with similar subjects, events, or lessons creates a fusion of knowledge across multiple instances, creating substantial value in enhancing techniques and procedures (Piplai et al., 2020).

Content analysis has been used before with written AARs and is an effective method for retrieving themes and commonly occurring phenomena (Ross et al., 2008). While this type of analysis can be performed manually, the use of electronic content analysis programs and statistical software packages can significantly decrease the time required (Morrison & Meliza, 1999). It is most frequently used as a way of analyzing textual information and systematically

and reliably condensing it into fewer content categories; it discovers what are the quintessential characteristics of messages (Stemler, 2001).

Application

While the lessons-learned field tends to be understudied, it has been repeatedly demonstrated as an efficient and effective way of transferring valuable knowledge (Jugdev, 2012). Nevertheless, while there is consensus that the application of lessons learned is valuable, there is not much agreement on *how* to apply lessons learned; there is no generally accepted approach (Nussbaum, 2016).

World Vision, a Christian global humanitarian relief organization, has hosted conferences to create internal and industry-wide lessons learned after major disasters, trying to enhance future performance during responses (Stoto et al., 2019). Outcomes from significant organizational events are ripe for capturing via AAR as they can possess rich learning value (Nussbaum, 2016). Shell Oil, Harley-Davidson, Fidelity, IBM, and Colgate-Palmolive all have versions of deriving and applying lessons learned from processes that link back to either written AARs or the U.S. Army's After Action Review (Kaliner, 2013; Sawyer & Deering, 2013). Similarly, the implementation of processes to capture and debrief successes and failures, and applying those lessons learned, improves individual and team performance in military settings (Ellis & Davidi, 2005).

The United States Air Force's AMC is not the only organization that struggles with how to best capture lessons learned. Any organization can become a victim of stove-piped information held inside functional communities, inaccessible to others who could benefit from those lessons. Simply documenting them is not enough; improper analysis or application will result in the same issues continuing to creep up and cause disruption (Wellman, 2007).

One way to enhance the application of lessons learned is to empower program managers or trained facilitators, who undergo specific training in this area (Moffett et al., 2015). The training provides the individuals with the necessary skills to apply lessons learned within organizations, but also ensures a systematic way to consistently employ a process.

Human Behavior

While some of the benefits of the AAR process may be known, human behavior can be a significant hurdle to overcome when trying to implement new processes or make changes (Jugdev, 2012). Even if an organization builds standardized, accessible lessons learned programs with capability for analysis, it will not amount to anything if people will not use it, or the leadership does not value it. Quality AAR programs are championed by leadership, without who it would be impossible to execute (Nussbaum, 2016). True learning is difficult; reports and analysis are often ignored, or lessons are too isolated and perishable rather than generalized and institutionalized (Donahue & Tuohy, 2006).

Buy-in to the program is important. People need to feel that they can receive value from AARs and lessons learned and that they do not simply exist for executives' benefit (Garvin, 2000). At the outset, participants need to feel safe with what they document as a lesson learned especially if it captures mistakes or failure. There is widespread agreement that the purpose of AARs is to improve people and systems and not cast blame when things go wrong. Using the AAR or similar product in this way reduces participants' buy-in and the likelihood of remaining part of the process (Stoto et al., 2019). The fear of reprisal is very real, which makes many reluctant to share things that happened, which can fuel AARs as attention-seeking "atta boys" to produce good news for the bosses (Wellman, 2007). AARs and lessons learned should be developmental, and not used to judge or evaluate performance (which should be captured via

other means). The focus needs to be purely educational, targeted at improving processes and procedures, and not looking to assign blame to individuals (Moffett et al., 2015). They should be treated and conducted like collaborative meetings with the sole purpose of enhancing learning (Mastaglio et al., 2011).

For this reason, it is also important that AARs capture best practices, good things, beneficial actions, etc. (Donahue & Tuohy, 2006; Stoto et al., 2019). Leadership and employees at all levels must take an active role in the program, as simply having a standardized and available system is not enough to synthesize and integrate lessons within the organization; this must be accomplished by humans (Savoia et al., 2012).

The United States Air Force runs its own Lessons Learned Program, for which most of the relevant guidance is contained in Air Force Instruction 10-1302. This instruction mandates the implementation of a service-wide lessons learned program and outlines its purpose, roles and responsibilities of different command echelons, and other elements. The Air Force defines a lesson learned as “an observation...that, when validated and resolved, becomes an evaluated insight resulting in an improvement in military operations or activities” (Air Force Instruction 10-1302: Air Force Lessons Learned Program, 2019). AARs are a method of “collection” as defined by this instruction and “are intended to help Airmen learn from experience to fight a smarter, more capable fight” (Air Force Instruction 10-1302: Air Force Lessons Learned Program, 2019). In further description of what type of content should be in these Air Force AARs, the instruction outlines the submission of the reports should be timely and result in improvements to military operations at any level (strategic, operational, tactical, etc.). The reports should be more than simply a collection of statistics or a summary of actions taken during an event (Air Force Instruction 10-1302: Air Force Lessons Learned Program, 2019).

This same instruction also contains a formal Air Force definition of AAR, and details it “is a consolidated report that includes an executive summary covering the event information (e.g., dates, locations, and participants) and Observations...” (Air Force Instruction 10-1302: Air Force Lessons Learned Program, 2019). The “Observations” noted here are defined in the preceding paragraph. The definition from this instruction sets a minimum required content for all Air Force AARs.

The nature of the human behavior element is overarching, and it influences each step of the AAR process. These influences can be positive or negative. Therefore, in further examination of this problem, Wells’ framework is adjusted to account for the influence of human behavior on each part of the process to produce a successful AAR. The updated framework is seen in Figure 2.

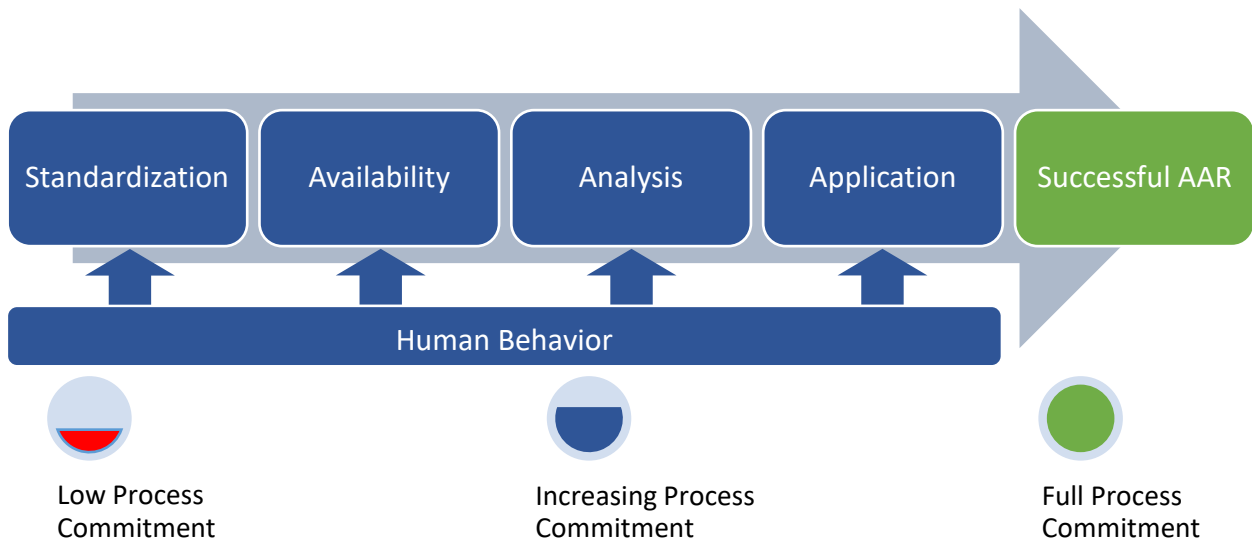


Figure 2. Updated AAR Framework

Conclusion

After an exercise or operation, especially if it is successful, it is possible to be fooled into thinking success grants immunity to all lessons learned between the last event and the next. However, planning must continue, and the learning process must be iterative; the time in between should be used to train, learn, and prepare for the next event (Kaliner, 2013). Identifying strengths, exposing weaknesses, and improving capacities and capabilities, lessen the impact of future negative incidents (Davies et al., 2019). The need for consistency, and a common structure in the lessons learned program, would facilitate analysis of individual events and enable cross-incident analysis if the reports were searchable from some kind of electronic structure (Stoto et al., 2019). Spending time consolidating and writing AARs is not where the true value is; if the lessons are not used for training or further analysis, with long-term commitment, nothing will come of it (Donahue & Tuohy, 2006). While the framework for lessons learned success is here in the preceding paragraphs, the challenge remains in not repeating the same mistakes event to event, never truly synthesizing. Over time, reviewing incidents and identifying lessons may be more readily accomplished than it was previous, but true organizational and systems-level learning remains difficult to achieve (Savoia et al., 2012). To maximize the long-term benefits of these programs, the “lessons learned” must be continually tested to cement learning, be incorporated into training and exercises before being heralded as best practices (Kaliner, 2013). The sustained and repeated engagement that reaches the most people and influences the most processes involved has the greatest chance for success of achieving deeper and more valid insight (Davies et al., 2019).

A community or organization that can get this right, effectively capturing lessons learned and applying them across all applicable disciplines and personnel, will be able to gain an

advantage over competitors. Adept learners can respond faster and build competitive edge more rapidly than opponents, and in the era of global competition (whether military or otherwise), this is a powerful tool (Wellman, 2007). The common goal in lessons learned is to share performance information to stop adverse events from recurring, and position to better meet future challenges (Donahue & Tuohy, 2006).

The AAR itself then presents a valuable tool through which to achieve learning objectives. AARs are designed to make learning routine and a part of self-assessment (both individual and organizational) (Garvin, 2000). A comprehensive lessons learned program confers distinct advantages, and in practice, some agencies have found it is easy to grasp and inexpensive to apply on a small or large scale (Garvin, 2000).

III. METHODOLOGY

Research Design

Beginning from Wells' foundation focused on improving AARs within the MAF, the research design centered around specific areas of the framework for "Full Process Commitment." To improve AARs through standardization, the author reviewed key strategic guidance documents, Air Force and Joint doctrine, and specific Air Force Instructions to catalog a list of objectives and behaviors that are practiced or tested in exercises or real-world operations. Previous AMC AARs were reviewed to discern what type of information was typically being captured after exercises and major operational events. Commonly occurring categories in the reports, along with other general topics for AARs seen in instructions and the literature review, were then used to create an itemized list of potential standard AAR content. This review resulted in a list of 24 items that could be (or currently are) included in AARs. A list of these 24 items can be seen in Appendix A.

The content of an AAR needs to contain information that is valuable to a decision-making authority. The information included in an AAR will have value to a decision-maker if it is both *relevant* and *actionable*. Leaders' time is limited, and the increasing availability of information quickly leads to information overload; therefore, only the most relevant information should be presented and considered for decision-making (Lu & Kokar, 2020). However, even if the information presented to a leader is relevant, if a decision cannot be made from it then it is useless to present it. To determine whether each of the 24 items previously discussed should be included in an AAR, a two-question heuristic was developed to determine if each item was both relevant and actionable. An item would be determined to be valuable to a decision-maker only if

it was at least “moderately relevant” to improving military operations and it was considered to be capable of informing a decision.

As the researcher was looking to answer specific questions on standardization, and seeking to further understand the nature of the problem in an exploratory nature, a survey method was appropriate (Jones et al., 2013). Survey methodology has been used with success in the field of organizational learning in the past (Garvin et al., 2008). To accomplish this, the itemized list of AAR content was adapted into a 24-item questionnaire to be used as a survey instrument in the research study. Each of the 24-items is worded with the intent to make it simple, taking care to avoid double-barreled questions as these can skew results (Kelley et al., 2003). The questionnaire was designed to have respondents answer the two-question heuristic for each of the 24 items. Evaluation of the items against the heuristic would determine if they (referred to as “information categories”) should be included in AARs. The heuristic answers:

- 1) How relevant is this information category to improving military operations?
- 2) Information in this category can inform a decision.

A 5-point Likert-type ordinal scale was used for responses to heuristic question one. Likert-type scales are especially useful when administered with other data gathering approaches such as interviews (Beglar & Nemoto, 2014). The range of responses in the scale can be seen in Appendix B. A structure with less than 7 response categories is less demanding of respondents and induces less fatigue (“Int. Handb. Surv. Methodol.,” 2008). With the questionnaire comprising 48 total questions, the 5-point unipolar scale was used to not put an additional burden on the respondent, with the scale still capturing the objective of the survey (Fogli & Herkenhoff, 2018).

A 5-point Likert scale was used for responses to heuristic question 2. The scale measured the degree of a subject's agreement with the statement "Information in this category can inform a decision," from Strongly Disagree to Strongly Agree. Altogether, this gave a respondent 48 total questions to answer (24-AAR content items with two heuristic questions each). The questionnaire was designed to elicit whether each of the 24 content items has value to include in AARs. If an item was determined to be at least "Moderately relevant", and achieved an agreement that it was actionable information, then it was determined to have value.

After questionnaires were received from all respondents, a semi-structured interview was conducted with each subject. The purpose of the interview was: to gather additional expert information from respondents on any items they thought should be re-worded, clarify any of their answers, add new items for consideration to the overall list of content, and explore the general nature of the problem. Semi-structured interviews offer data gathering flexibility and complement other research methods, especially when using open-ended questions (Jones et al., 2013). Asking participants open-ended questions has also been shown to be a good method to capture unanticipated responses in exploratory research (Fogli & Herkenhoff, 2018). The list of standard questions posed to each participant in the semi-structured interview can be found in the Interview Guide in Appendix C.

A maximum of 8 participants were identified for the study due to institutional limitations for human subjects and survey methodologies. Participants were chosen using purposive sampling to specifically target personnel with expert knowledge of and previous involvement and exposure to the military environment, operations and exercises, and AMC AARs. Purposive sampling is an effective method when expert information is sought or when knowledge is specific to certain communities (Kelley et al., 2003). All participants chosen were officers or

government civilians in the United States Air Force currently assigned in AMC. Participants came from various levels of assignment, including unit, wing, center, and Major Command staff (HQ AMC).

Research Execution

All proposed research participants were contacted via electronic means to describe the intent and method of the research and to gain permission to contact them with the questionnaire and interview guide questions (reference Appendix D for the cover letter and instructions sent with each research solicitation). All eight potential respondents affirmed they would fully participate in the study. The 24-item questionnaire with instructions and the interview guide (Appendix C) were then sent electronically to all participants. Each participant's interview was scheduled as the questionnaires were electronically returned over 40 days.

All eight research subjects returned a fully completed questionnaire, and all eight participated in interviews. Interviews were conducted telephonically, with one exception (in-person). The actual interview length ranged from 24 minutes and 18 seconds to 39 minutes and 45 seconds, with an average length of 31 minutes and 15 seconds. In each case, the interviewer spent the first few minutes of the session going over the respondent's professional background, to break the ice and put them at ease. During each interview, audio was recorded and then later transcribed verbatim to a word processor after the interview was concluded. The researcher used the established questions from the interview guide as the official prompt but let the respondent take the answers as far-ranging or as broad as they wanted to go. If the respondent went too off-topic with subjects outside the scope of the project, the interviewer refocused their attention on the specific questions from the study. Each question was purposefully open-ended to explore each topic fully and to gain insight into things that may not have been considered before. After

transcription, content analysis was performed on each interview to record ideas and themes. Content analysis is a useful technique for examining patterns, trends, or themes in textual documents (Stemler, 2001). It can be used in qualitative research studies to analyze transcriptions of interviews (Grayson et al., 2020).

Through all research processes detailed above, care was taken to protect the identities of all participants. Informed consent was reinforced at each engagement. Participant identities were known only to the researcher (as a function of the interview procedures), and no identifying information was kept after any part of the questionnaire or interview process. All interview recordings and any records containing personally identifying information were sanitized after the study.

IV. ANALYSIS AND RESULTS

Data Analysis

The first step in analyzing the data was the questionnaire. All questionnaire responses were cataloged by category to portray the frequency of occurrence. To depict the average answer to each question, numerical values of 1 to 5 were assigned to each response and can be seen in Figure 3.

Heuristic Question 1

1	2	3	4	5
Not at all relevant	Slightly relevant	Moderately relevant	Very relevant	Extremely relevant

Heuristic Question 2

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

Figure 3. Numerical values assigned to Likert scale responses

A summary table of statistics can be found in Appendix E. After assigning numerical values and calculating the average response, 23 out of 24 items had an average information relevance score of at least 3, with one exception. An average score of at least 3 indicates these information categories were at least “Moderately relevant.” The exception was the “Abbreviations and acronyms” category, which had an average score of 2.875; at least “Slightly relevant” but not “Moderately relevant.” Collectively, the research subjects found “Recommendations in response to specific observations/deficiencies” to be the most relevant category of information with an average answer of value 4.75. The standard deviations of answers to heuristic question 1 ranged

from 0.46 to 1.28, with just 4 out of 24 categories having a standard deviation of at least 1 (answers within one value of each other).

For heuristic question 2, 24 out of 24 items had an average response of at least 3, indicating that there were no information categories that subjects, on average, concluded could not inform a decision. In comparison, 19 out of 24 categories had an average score of 4, indicating that subjects, on average, concluded those information categories could inform a decision. Collectively, the research subjects found “Narrative description of lessons observed/learned” and “Recommendations in response to specific observations/deficiencies” to be the information categories with the highest level of agreement that they could inform a decision. The standard deviation of responses to heuristic question 2 ranged from 0.35 to 1.12, with 5 out of 24 categories having a standard deviation of 1 or greater.

Concerning the interview data, content analysis was conducted on each transcription manually. The responses were coded simple and at a high-level, with overall ideas and themes comprising the list of initial codes. The presence of a code within a single interview was sufficient for recording, and multiple or repeated occurrences of that code in the same interview were not considered more significant. There were 125 total initial codes assigned, 59 of which were unique. The complete list of 59 unique initial codes can be seen in Appendix F, along with the number of research subjects they were recorded from. After all initial codes were recorded, focused codes were developed by determining which codes were found in more than one participant. The list of focused codes can be seen in Appendix G. Focused codes are discussed in detail in the Discussion section. Focused codes were determined to be significant if they were mentioned by at least half of the research subjects (4 out of 8).

Results and Discussion

This research sought to investigate how to standardize AMC AARs, assess the potential for analysis over time and for trends, and provide additional insight into a complicated leadership challenge. As data was gathered and analyzed, results from the analysis were measured against the corresponding areas of the updated AAR process framework. In each section, recommendations for actions to take and some pitfalls to avoid are noted. The goal is to continually move toward a value-added lessons learned process with a robust AAR as a collection tool.

Standardization

The purpose of the questionnaire was to assess a list of standard AAR content that could be applied to a wide range of scenarios and uses. The questionnaire results could be used to inform the creation of a standard template for AMC. Each information category was assessed on its relevance to improving military operations, and its ability to inform a decision. In fulfillment of that purpose, the questionnaire was successful in determining all but 1 proposed category were both relevant and actionable. Abbreviations and acronyms did not meet the minimum standard considered in both categories, however, this may still need to be included for ease of understanding the report (even if it is not relevant for analysis). For what respondents thought was *most* relevant and actionable, see Table 1. Information categories that had an average score of at least 4.5 for both heuristic questions are displayed, in descending order of combined average score.

Table 1: Information categories with highest combined scores

Information Category	Average Response
Recommendations in response to specific observations/deficiencies	4.8125
Narrative description of lessons observed/learned	4.75
Narrative of recommended focus areas for next event	4.6875
Narrative description of significant challenges faced	4.6875
Description and explanation of why selected objectives' performance were less than satisfactory	4.625
Command and control diagram(s)	4.5625
Individual AARs for specific weapon systems or functional communities (C-17, C-130, Contingency Response, Logistics, etc.)	4.5

These top information categories are the most essential to include in any standard AAR template. See Appendix H for the complete list of information categories in a similar format to Table 1, displayed in descending levels of importance.

While the questionnaire fulfilled its purpose of collecting feedback on standard AAR content, it had limitations. In the creation of the instrument itself, it is possible that the researcher did not include information categories that would have been appropriate. A specific question for additional content was present in the interview guide to address this limitation. Furthermore, with a relatively low sample size of 8 participants, it is not possible to generalize any of the responses to the larger population of all AMC users of AARs (not enough statistical power). There is also inherent sampling bias when using purposive sampling, as it is non-random and restricts generalizability to the greater population (Kelley et al., 2003).

During the interviews, some respondents gave direct feedback on the questionnaire itself. Comments were made indicating a good deal of “it depends” answers. For example, answers to specific measures would change depending on what role the respondent had chosen to assume or at what echelon of command or staff they would choose as a matter of perspective. Because there are many different levels of leadership or positions of authority the questions could be answered from, some respondents noted it was hard to determine answers to the relevance dimension. This was because most information could be relevant to somebody, somewhere, given a wide enough

range of options. Likewise on the decision dimension, with leaders at all levels within AMC, it may be hard to find a category of information that *cannot* be used to inform a decision. These factors may have led to more inflated (in terms of value) answers on all the measures in the questionnaire.

In answering Research Question 1: “How can AMC AARs be standardized,” the analysis of the questionnaire provides a partial result. The questionnaire results led to a list of standard AAR content based on relevance to improving military operations and the ability to inform decisions. This list of content can now be provided to AAR users when building their reports or provided as building blocks for a standard AAR template. This could be valuable to units struggling with AAR structure issues, as they might now know what to include in a report. One of the focused codes from the interviews revealed that 5 of 8 respondents specifically called for a standard AAR template. Currently, there is no standard for content or template made available across the command. Several respondents detailed this led to locally developed formats with lots of variability, and AARs were sometimes submitted as emails, word processing documents, or slide presentations.

The interviews provided further insight into other considerations affecting standardization. While standardization was acknowledged to have value and would aid analysis of reports, some respondents advised too much standardization removes the flexibility personnel need to address observations adequately. Six out of eight respondents observed that different communities and functional organizations within AMC have varying uses for AARs. Generally speaking, organizations that are using AARs adapt them to best suit their own needs. This flexibility is something commanders need. Therefore, the command should avoid an overly-prescriptive standardization of AARs that removes the flexibility units need to tailor the reports

appropriately for their own uses. The recommendation for standardization is to establish a standard for the minimum required content and format in an AAR, but allow commanders and other submitters the flexibility to tailor the reports further.

Availability

The availability and accessibility of AARs in AMC limit their utility and prevent analysis and application of lessons learned to the wider community. Five of eight respondents made remarks effectively saying that the poor accessibility of existing AARs hinders their value. There were multiple mentions of a desire to seek previous AARs from exercises or operational events, but personnel did not know where to look, or if they did, did not have digital permissions or access to the places they were kept. Due to the issues with AARs being accessible, there was another focused code assigned, with 4 of 8 respondents remarking there was an over-reliance on direct communications to distribute AARs. Since there was no central location where AARs were stored or they did not have the right access, personnel would try to locate a person who might have them. This led to direct email requests to individuals for the reports, and when successful, would result in a direct email with the AAR as an attachment. While direct communication for dissemination might be effective on a case-by-case basis, it is not efficient. This is especially true when many people want access to AARs; they should not have to rely on personal email communications for access.

Availability can be difficult to solve, as it lies on a spectrum with security and data integrity. The Air Force and AMC must keep information secure, and the more people can touch, manipulate, or have access to the information, the less secure it becomes. Regarding availability, two respondents commented that completely unrestricted permissions to an AAR bank could easily result in “information overload,” where the resource would be flooded with meaningless

or non-value-added information, thereby making analysis more difficult due to more noise. Two respondents also stated that “siloe thinking” unnecessarily resulted in restricted information access. For example, a particular functional community on the staff or within a wing might restrict access to their shared drives or SharePoint sites where they keep AARs, thinking that the information would not apply outside their specialty. This could be a result of failing to think of cross-functional applicability.

To combat the issues with availability, 5 of 8 participants cited a need for an accessible location to post AARs. In describing the nature of this location, a common idea proposed was a central, electronic location where AARs could be deposited. It should have minimal permission restrictions, to give any AMC personnel the ability to pull AARs they are interested in reviewing or analyzing, at any time. The central location is important because it directly attacks the issue of AARs not being accessible. This location would also need to be well-advertised and communicated to all users. One commonly cited issue among the respondents was the collective failure to “close the feedback loop.” This repository gives personnel the power to close the feedback loop themselves, rather than waiting on an email from an individual. In creating this repository, or re-purposing an existing one, care should be made to emphasize accessibility, rather than security. A minimum security level should be established for CAC-carrying members and employees of the Department of the Air Force, or AMC. Beyond that, the urge to lock the site down to members assigned to a particular staff office or unit should be avoided.

A potential solution already in place is the Joint Lessons Learned Information System (JLLIS). JLLIS is already the Department of Defense system of record for lessons learned and distribution of AARs (Air Force Instruction 10-1302: Air Force Lessons Learned Program, 2019). A thorough review of AFI 10-1302 is also important because it contains many directives

regarding the program, one of which is to Major Commands and their requirement to upload AARs to JLLIS no later than 30 days after an event (Air Force Instruction 10-1302: Air Force Lessons Learned Program, 2019). Permissions to access JLLIS are simple to obtain by navigating to the site and creating a request. While JLLIS will not accomplish any kind of analysis on reports, it does function as a databank of AARs across all commands and military services, representing a wealth of collected defense information and potential lessons learned. It is relatively simple for all registered users to upload and retrieve files. Using an existing system could quickly fill this requirement the field is asking for; it would only require a bit of education to AMC personnel that it already exists for their use.

Analysis

Personnel in AMC are rarely aware of analysis being performed on AARs because the aforementioned feedback loops are seldom being closed. It is also difficult to apply the same type of analysis to all AARs within the command, as the formats and content are not consistent. Furthermore, since different groups have differing needs for the content and information in AARs, it follows that they need different types of analysis to reap their lessons learned and apply them.

During the interview process, there were two commonly-stated purposes of an AAR. One purpose was to generate lessons learned (3 of 8 participants), and the other was to document or record a significant event (3 of 8 participants). Most participants recognized that AARs generally serve multiple purposes and were a combination of the two reasons given above. Other stated reasons were to capture impacts to tactics, techniques, and procedures, justify allocation or expenditure of resources, capture impacts to DOTMLPFP (doctrine, organization, training, materiel, leadership and education, personnel, facilities, policy), update instructions, record

commander's intent, and to log unit performance and readiness assessments. All these varying stated purposes make it more difficult to determine what data to analyze and what type of analysis to conduct.

One of the specific research questions was (R.Q. 2): "How can AMC AARs be constructed to allow longitudinal and trend analysis?" While there was a specific question asked of participants via the interview guide on this topic, responses were not insightful. More than one respondent recognized that trend and longitudinal analysis could be useful, but there were no ideas among any respondents on what to conduct it on. More research needs to be done in this area to determine what types of information contained in AARs would be useful to track over time. Engaging senior leaders in the command directly for this insight could be valuable. At the outset of the project, there was also interest expressed in having the AARs analyzed electronically via data analysis software packages or coding of the AAR repository to do this automatically. However, given the results revealed via this study, it is recommended implementation of that capability be delayed until the lessons learned process is more mature.

Application

A recurring theme of this study is that different organizations have different needs for AARs, which partially informs why there is so much variability in them across AMC. Different needs drive different content and analyses, which means any AARs or lessons learned in the application phase of the framework could rarely be applied equally to all units. At the staff and field level, two respondents remarked that the contingency response (C.R.) community seemed to perform exceptionally well with AARs and applying lessons learned from them. Small team AARs are prevalent in this specialty, as they tend to deploy in small teams rather than large groups. Turnover for these CR AARs can be high as well, as a team might be deploying to

relieve one currently in place, and has an immediate need for all the information that would be contained in an AAR. The use case differs when compared to applying lessons learned from an AAR from a large force joint exercise like Mobility Guardian, where planning takes place over months and years. The report is larger and essential for capturing objectives that were met or not met, and applying lessons learned to the next iteration of the exercise. To further illustrate limited applicability, Mobility Guardian AARs are a good example. In a large, sweeping event like Mobility Guardian, all elements of the report will not be equally applicable to all functional communities that touch the event. The entire report will be relevant to the joint exercise division within the AMC/A37, but not necessarily the AMC/A4 or A2. Likewise, much of the report would not be relevant to civil engineer functionals on the AMC staff or within the wings, unless there were observations in the report with feedback or impacts to real property, facilities, etc.

Many lessons that could be applied are simply lost due to the non-closure of feedback loops regarding AARs in general. Six of eight respondents made comments indicating one of their chief problems with AARs and lessons learned processes was that there is no closure to the feedback loop. There were several common examples of this issue. After Action Reports would be submitted to leadership or the requesting office but were never heard of again. Writers of AARs and submitters of lessons learned had expected to hear back on the adjudication and results from their submissions, however, in most cases, the feedback loop was never closed and the submitter was left wondering what happened. This was true in cases of individual observations from reports, but also of entire completed reports. When coordination of a lesson learned at the H.Q. level takes 6 months, 1 year, or 2 years or longer, any potential gain has been lost as staff members have moved on to other projects, leaving members wondering what happened with their submissions. Within AMC's lessons learned tracking tool, many potential

lessons remain unresolved, in various stages of adjudication or validation, some with significant age.

For the application phase to be achieved, the feedback loops must be closed, fueling a successful AAR process. Personnel must see a result to their efforts, and promptly. Without closure to that loop, units in the field do not know what changes to make or what actions to stop or sustain. Staff and action officer bandwidth is a major factor in the timely coordination of these lessons learned, and the content of AARs is perishable information. Finally concluding a lesson learned in 2022 from an exercise in 2017 will likely be minimal value-added. Offices requesting AARs must prioritize closing the feedback loop to the submitters, as the application phase is the phase where the real value from the entire process is realized.

Human Behavior

The current value of AARs within AMC is widely variable at best, and among the participants in this study, mostly ineffective. It was particularly stated by 4 respondents that AARs in their current form and process were not effective at all. This is due to a breakdown in one or more areas of the AAR process framework seen in Figure 2. Human behavior influences each phase of that framework, positive or negative. It affects the closing of feedback loops, establishment of guidance, availability of reports, distribution to relevant parties, and formation of a culture that values lessons learned processes.

In several sections of this paper, it has been mentioned feedback loops are not being closed regarding AARs and lessons learned. When the feedback loop is not closed, there is no lesson to apply at the receiver's level, and the value of the process is lost. Aside from the practical implication of that loss, failure to close the feedback loop also results in an overall loss of faith in the whole endeavor. One participant noted when they would submit AARs and lessons

learned, and never heard back on adjudication or the impact of that work, it caused them to rethink putting in all the work to produce them. With no confirmation that what they were doing had value, they questioned its worth entirely.

When it comes to accessibility and availability, human behavior is also a factor. One respondent said in discussion they knew of personnel who were interested in reviewing AARs, but they did not know where to go to find them and did not know who to talk to about them, so they abandoned any attempts to search them out. Electronic access and permissions are seen as a significant hurdle to overcome, and they are an obstacle keeping more people from participating in the lessons learned program. Anything that could be done to break down those barriers would result in more personnel willingly participating in the program, simply by using effective channel factors like a well-communicated, easy-to-use databank of reports.

One respondent noted another human behavior factor affecting the process. As is true with anything, individual personalities matter, and can be positive or negative influences. In the absence of leadership taking an active role, and without known directive guidance, individual initiative becomes more prevalent. This respondent mentioned that even when other AAR issues are fixed (AARs are understandable, available, capable of analysis, lessons ready to be applied), it comes down to the individual being willing to do something about it. This person had known people serving in a certain position that could certainly benefit from reviewing previous AARs to do their job, but they did not simply because of a lack of personal initiative. A perceived immature lessons learned culture within the command also impacts the human behavior aspect.

There are two things revealed by the study which could help solve this human behavior problem. The first is the establishment of definitive guidance on the lessons learned program, to include AARs as a collection tool. Six of eight participants in the study alluded to the need to

formally codify AAR and lessons learned processes in policy, instructions, or guidance. When asked pointed questions about what the lessons learned or AAR process was supposed to look like, most answered by describing what they or their offices did, instead of what they were required to do by directives. Many implied they were working AAR and lessons learned processes without the influence or direction of written guidance. One respondent was aware of AFI 10-1302 and relayed an AMC Instruction (AMCI) with supplemental lessons learned guidance was in coordination for publication. Many other respondents noted that while AAR or lessons learned guidance was not in AFIs, AMCIs, or directives of that nature, it would sometimes be contained in others. These could include official operational or exercise orders (EXORD, OPORD, etc.), crew paperwork for an airlift mission, or within the special instructions for an event. Formally codifying guidance on AAR and lessons learned processes is important because it conveys expectations. Making it formal also communicates it is a commander's priority, which 3 out of 8 respondents noted was important to do. Without formal guidance to operate from, members in the field are coming up with what they think is best, rather than knowing they are doing it correctly. The command should be careful to avoid a pitfall when establishing this guidance, similar to standardization, in that it should be prescriptive enough that units know what they need to know, but still allow them the flexibility to make the best local decisions for themselves.

Establishing written guidance fuels the second solution, which is making lessons learned a leadership priority. Three of eight participants in the study remarked about the need for commanders to clearly communicate the value in the process and their expectations for committed participation from all personnel. Commanders and leaders in AMC need to make lessons learned a common term in their lexicon. Much like commanders' operational and social

priorities for their units, people will not know them unless they hear them often. Participation in lessons learned processes should be part of staff meetings, self-assessment checklists, etc.

V. CONCLUSION AND RECOMMENDATIONS

Overview

The goal of this research was to improve AMC AARs. AARs are a tool to record events and capture lessons learned for future military exercises and operations. Improving AARs means a better opportunity to accurately capture and record contingencies, major exercises, crises, and a better opportunity to chronicle observations on things that worked or did not work during the event. A majority of the participants in this study made a point to say they thought this problem was worthy of analysis and solving. As one respondent noted, this effort is especially important now as the previous 2 decades of persistent military conflict draw to a close. The United States had been involved in significant military operations in Afghanistan and Iraq since 2001 and 2003. The collective experiential knowledge gained from these conflicts will expire as the direct participants reach retirement age, and the military and its personnel transition to other pursuits. If AMC cannot capture the lessons from these operations, this experience and knowledge will vanish, perhaps doomed to be repeated in the next conflict. A reliable process and the necessary measurement instruments to capture this data, and apply those lessons, are necessary now as events continue to occur.

Theoretical Contributions

With no established theory of AAR to work from, previous research into this topic developed an AAR framework to use in their study. That framework (seen in Figure 1) contained standardization, availability, analysis, and application as necessary elements to achieve a successful AAR (Wells, 2021). In this study, a human behavior element was added to account for those influences affecting each phase of the process. Any future research into this topic should consider AARs within that updated context, as seen in Figure 4.

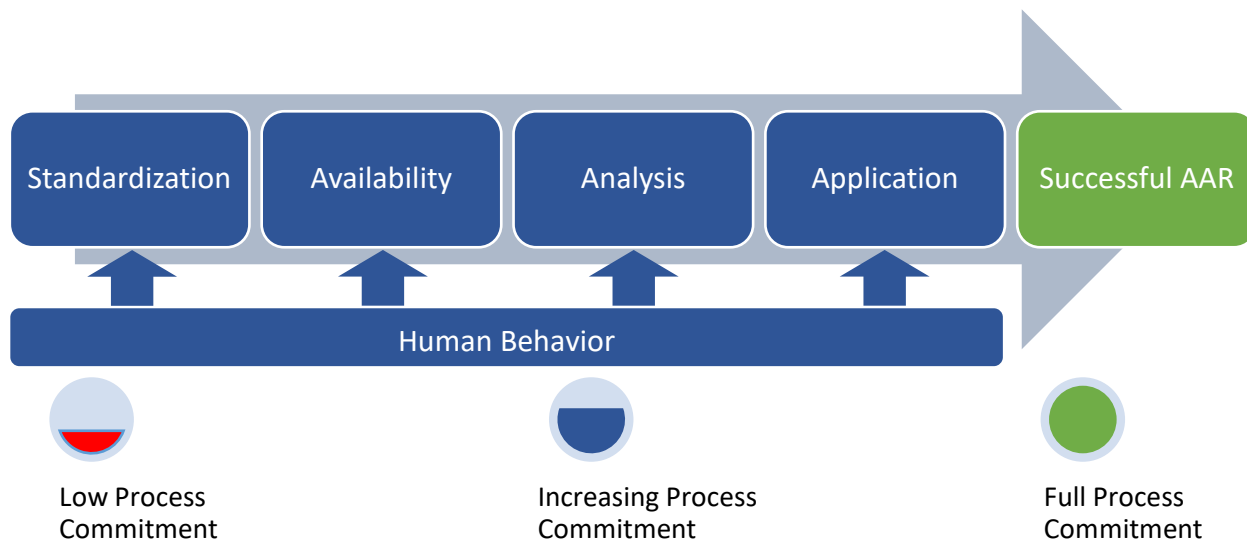


Figure 4: Updated AAR Framework

As the framework shows, if a unit or a staff can pay adequate attention to standardization, availability, analysis, and application, and recognize the positive or negative effect human behavior has on each phase of the process, and successful AAR process can be achieved.

Recommendations

Based on the complete results of the study, from both the questionnaire and the semi-structured interviews, the researcher makes the following recommendations to the AMC staff.

Offer a standardized AAR template

This study established that AARs: serve multiple purposes, are used with great variation by staffs and units, and lack a standard AMC template. The researcher offers a recommended list of standardized information categories that most activities should find a use for (Appendix H). However, it is recommended that any template should be offered as a tool to use when chosen (or as directed by leadership) to still allow units to tailor reports for their uses to maximize their utility. Offering a standardized template to the field also shows that AMC is invested in writing,

analyzing, and promulgating value-added AARs and wants to give the right tools to units to accomplish this. A list of minimum required content could also be established, for which units could then go above and beyond if they chose. If the command chooses to incorporate more quantitative data in AARs, it is recommended not to eliminate accompanying narratives as this study established those were the sections of highest value.

Invigorate lessons learned culture

Lessons learned programs are ways of accomplishing organizational learning and transferring knowledge efficiently between its members. While AMC has a lessons learned manager, and a managerial process to coordinate them at the MAJCOM HQ level, there is a lack of guidance on how it should be conducted, and it may not be fully understood or embraced below the MAJCOM level. While this study primarily focused on AARs and their content, it was established that lessons learned are a key element of AARs and one of the primary purposes for completing them. Many lessons learned captured from AARs are taking too long to coordinate, adjudicate, and distribute back to the field to close feedback loops. Without knowledge of a concrete process to follow, personnel are left in the dark regarding their roles in the AMC lessons learned program. Establishing clear guidance for this program will communicate that capturing and applying lessons learned is a priority for the commander and is an expectation that all commanders participate. The AMCI in coordination should be signed and promulgated as quickly as possible. Commanders at all levels should then follow up the published guidance with their own directive intent to prioritize lessons learned management and processes. Priorities should also be established for lessons learned coordination at HQ AMC to combat languishing items in the AMC/A9 coordination tool. If staff members do not have the bandwidth to coordinate all the lessons learned, at a minimum they could address those of highest priority.

Establish AMC AAR repository / Utilize JLLIS

It became clear during the interviews that a common problem related to AARs was their lack of accessibility, and this was also established by Wells' project in 2021. No amount of well-written, standardized content will make AARs successful if they are not accessible. The researcher recommends establishing and directing the use of a central electronic repository for AARs, regardless of their subject matter. The repository could hold reports from exercises, contingencies, humanitarian responses, one-time operations, non-combatant evacuation operations, etc. The repository should have search functionality and contain enough metadata to meaningfully separate reports from each other and be tagged with different categories to divide them. For example, a user should be able to easily search for all AARs containing data about KC-10 exercises, or all contingency response deployment AAR from a specific year. Permission restrictions should be kept to a minimum and the location should be well-advertised for personnel to be able to use.

Some versions of this already exist. On the AMC HQ staff, multiple electronic locations exist where AARs are kept. Additionally, the 621 CRW has a SharePoint site in use for their wing that already provides much of the previously described functionality. Their SharePoint site could be reviewed and benchmarked command-wide. Finally, the Joint Lessons Learned Information System (JLLIS) provides this functionality as well. JLLIS already contains hundreds of AARs and similar documents, and it is not difficult to get access as accounts are automatically approved. Air Force Instruction 10-1302 also states that "all Airmen are encouraged to create an account on the Joint Lessons Learned Information System..." so they can use the DoD system of record to upload and review observations for lessons learned. If the A.F. is already supposed to be using this program as the system of record for lessons learned, it may not be necessary to

create a new repository for AMC AARs and JLLIS can serve this purpose for the command. In the short term, this appears to be the best solution for availability.

Future Research

Further research into this topic should be accomplished in two areas. First, supplementary research into AAR trend analysis should be conducted. In the preceding section on recommendations, none of those actions directly attack or fulfill the desire to analyze trends across AARs. This either has to be executed manually by a human review of AARs and logging and comparing data across reports, or it could be done electronically. To do it electronically, research should be conducted on specifically what leaders want trends analyzed for (to target the right information), and then see if it can feasibly be done automatically via computer. Human review and analysis are possible but time-consuming. The ideal solution would be an electronic review, categorization, analysis, and presentation by computer software that could deliver this. Senior leadership should be surveyed directly on what they see as the most useful trends to track and on what to conduct longitudinal analysis.

Second, while it may not be traditional research, additional work should be done in investigating and analyzing lessons learned processes. After hearing all the feedback given in the semi-structured interviews, it is the opinion of the researcher that the lessons learned process could benefit from a continuous process improvement evaluation. In whatever method AMC would like to conduct, a group of SMEs should collectively process map the web of lessons learned activities, determine where there is waste, and seek to eliminate it. Adding value to the lessons learned program specifically will help in other areas of the AAR framework, namely the steps for analyzing and applying lessons learned from AARs.

Appendix A: 24-item List of AAR Information Categories

- 1) Summary data: counts of accomplished activities, i.e. # of sorties, # of cancels, lbs cargo moved, etc.
- 2) Narrative summary of overall event activities
- 3) Narrative description of key accomplishments
- 4) Standardized performance scores for selected tasks (i.e. wet wing defuel performance 4 out of 5 or similar)
- 5) Narrative of recommended focus areas for next event
- 6) Description and explanation of why selected objectives' performance were less than satisfactory
- 7) Description and explanation of why selected objectives' performance were satisfactory
- 8) Description and explanation of why selected objectives' performance were better than satisfactory
- 9) Specific requests for commander endorsement or action
- 10) List of overall event objectives or lines of effort
- 11) Video content (e.g. video of procedures or performance, video interview with key personnel, etc.)
- 12) Audio content (e.g. audio logs of performance, audio journaling, etc.)
- 13) Command and control diagram(s)
- 14) Description of events leading up to event on which the AAR is written
- 15) Summary of planning activities prior to event
- 16) Narrative description of significant challenges faced
- 17) Narrative description of lessons observed/learned
- 18) Narrative description of event's history (i.e. for recurring activities such as exercises)
- 19) List of commander's priorities established for the event
- 20) List and description of individual event phases
- 21) List of significant observations during the event
- 22) Recommendations in response to specific observations/deficiencies
- 23) Individual AARs for specific weapon systems or functional communities (C-17, C-130, Contingency Response, Logistics, etc.)
- 24) Abbreviations and Acronyms

Appendix B: Survey Heuristic Questions & Scales

A) How relevant is this information category to improving military operations?

Not at all relevant	Slightly relevant	Moderately relevant	Very relevant	Extremely relevant
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B) Information in this category can inform a decision.

Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
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Appendix C: Interview Guide

1. What is your level of familiarity with AARs?
2. Were you unsure about your answers to any of the questions?
3. Why do we accomplish AARs?
4. Are AARs effective? Why or why not?
5. Are there information categories you would add to standard AAR content?
6. What things can be done to increase the value from AARs?
7. What things might be useful to track for trends or longitudinal analysis?
8. How do you know when an AAR is mandatory?
9. What guidance governs AAR or lessons learned processes?

Appendix D: Survey Cover Letter & Instructions

This questionnaire is designed to identify valuable or non-valuable elements of an Air Mobility Command (AMC) After Action Report (AAR). An AAR, as defined by Air Force Instruction 10-1302, Air Force Lessons Learned, is: “a consolidated report that includes an executive summary covering the event information (e.g. dates, locations, and participants) and Observations. Observations to be documented are those which result in improvements in military operations. After Action Report Observations should describe how the mission could be/was improved, potential risks to mission degradation and how to mitigate those risks.”

On the following pages are 24 different categories of information typically found in AMC AARs. For each category, you will be asked to assess two items:

- A) How relevant is this information category to improving military operations?
- B) Information in this category can inform a decision.

Your answers to Item A will be measured on a Likert-type scale from "Not at all relevant" to "Extremely relevant". Your answers to Item B will be measured on a Likert scale from "Strongly Disagree" to "Strongly Agree". When the word "event" is used in an information category, it can refer to any military event, such as a single contingency operation, routine training iteration, military exercise, etc.

Considering your answers to Item A, determine relevance only as it relates to improving performance in military operations. If it is extremely relevant to improving military operations, it should be marked all the way to the right. If it has no relevance to improving military operations, it should be marked all the way to left.

Considering your answers to Item B, determine how much you agree with the statement for that particular information category. Consider all echelons of military decision-making in your answer (tactical, operational, strategic), regardless of the type of unit or staff function. If that category of information can inform a decision by a decision-maker, mark your level of agreement. If it does not or cannot inform a decision or affect the decision-making process, mark your level of disagreement.

As an example, one hypothetical category of information in an AAR could be “Type of food served at meals.” You might mark Item A for this category as “Slightly relevant” as you feel the type of food served at meals might improve military operations, but not by much, i.e. better food may contribute to better performance. On Item B, you might mark “Agree” because you have some level of agreement that a decisionmaker has the ability to control what food is served at meals.

Mark your answers by clicking the appropriate radio button above your chosen response for each question.

The results from this questionnaire may be used to recommend adjustments to standard AAR content to focus on the most value-added information.

Your name and associated responses will be known only to the researcher, Maj Brett Messer. Your responses in the questionnaire are designed to be paired with and discussed in a semi-structured interview, which is found on the last page of this packet, labeled “Interview Guide.” The Interview Guide is provided for information only on this form and will be used in an interview scheduled separately.

Appendix E: Questionnaire Summary Statistics

	Info relevance						Can inform decision							
	Not at all relevant	Slightly relevant	Moderately relevant	Very relevant	Extremely relevant	Average Response	Standard Deviation	Strongly Disagree	Disagree	Neither Agree/Disagree	Agree	Strongly Agree	Average Response	Standard Deviation
1) Summary data: counts of accomplished activities, i.e. # of sorties, # of cancels, lbs cargo moved, etc		1	3	2	2	3.625	1.061		1	2	2	3	3.875	1.126
2) Narrative summary of overall event activities				1	4	3	4.25	0.707		1	3	4	4.375	0.744
3) Narrative description of key accomplishments			3		5	4.25	1.035		2	1	5	4.375	0.916	
4) Standardized performance scores for selected tasks (i.e. wet wing defuel performance 4 out of 5)			3	1	4	4.125	0.991		2	3	3	4.125	0.835	
5) Narrative of recommended focus areas for next event				3	5	4.625	0.518			2	6	4.75	0.463	
6) Description and explanation of why selected objectives' performance were less than satisfactory				3	5	4.625	0.518			3	5	4.625	0.518	
7) Description and explanation of why selected objectives' performance were satisfactory			2	3	3	4.125	0.835		1	3	4	4.375	0.744	
8) Description and explanation of why selected objectives' performance were better than satisfactory			2	3	3	4.125	0.835		1	3	4	4.375	0.744	
9) Specific requests for commander endorsement or action		2	1	2	3	3.75	1.282		1	1	2	4	4.125	1.126
10) List of overall event objectives or lines of effort			1	2	5	4.5	0.756		1	3	4	4.375	0.744	
11) Video content (e.g.video of procedures or performance, video interview with key personnel, etc)			4	3	1	3.625	0.744		2	4	2	4	0.756	
12) Audio content (e.g. audio logs of performance, audio journaling, etc)		1	4	2	1	3.375	0.916		1	3	2	2	3.625	1.061
13) Command and control diagram(s)			4	4	4	4.5	0.535			3	5	4.625	0.518	
14) Description of events leading up to event on which the AAR is written			1	5	2	4.125	0.641			5	3	4.375	0.518	
15) Summary of planning activities prior to event			2	4	2	4	0.756		1	5	2	4.125	0.641	
16) Narrative description of significant challenges faced				3	5	4.625	0.518			2	6	4.75	0.463	
17) Narrative description of lessons observed/learned				3	5	4.625	0.518			1	7	4.875	0.354	
18) Narrative description of event's history (i.e. for recurring activities such as exercises)		2	3	1	2	3.375	1.188		1	2	2	3	3.875	1.126
19) List of commander's priorities established for the event			3	2	3	4	0.926			3	1	4	4.125	0.991
20) List and description of individual event phases			4	4		3.5	0.535			3	3	2	3.875	0.835
21) List of significant observations during the event				5	3	4.375	0.518			1	2	5	4.5	0.756
22) Recommendations in response to specific observations/deficiencies				2	6	4.75	0.463			1	7	4.875	0.354	
23) Individual AARs for specific weapon systems or functional communities (C-17, C-130, Contingency Response, Logistics, etc.)				4	4	4.5	0.535				4	4	4.5	0.535
24) Abbreviations and acronyms	1		6	1		2.875	0.835		1	1	2	4	3.125	1.126

Appendix F: Unique Initial Codes

Respondents	Code title	Respondents	Code title
6	Feedback loops not closed	1	AARs can record training/certification/readiness
6	Units/communities have different needs for AARs	1	Immediate facilitated after action reviews are good
6	Need to formally codify AAR/LL processes	1	No central location for lessons learned
5	AARs suffer from poor accessibility	1	Listing objectives needs to be standard in AAR
5	Need central AAR location	1	AAR/LL management is personality dependent
5	No standard AAR template	1	Units need flexibility to tailor reports
4	AARs serve multiple purposes	1	Many AARs too large to read
4	Reliance on direct communications for distribution	1	Writing AAR at end of event can lead to data loss
4	A problem worth solving	1	Recommendations should accompany observations
4	Current AARs are not effective	1	Tracking trends over time in AARs could be useful
3	AARs facilitate knowledge transfer	1	Current AARs difficult to analyze
3	Commanders need to make AAR/LL a priority	1	Units sometimes favorably doctor their AARs
3	Lessons learned take too long to coordinate	1	AARs should be linked to specific objectives
3	Primary purpose of AAR is lessons learned	1	AARs currently more effective at tactical level
3	Personnel do not seek existing AARs	1	Lots of data to sift through
2	Siloed thinking inhibits accessibility	1	Don't have the right tools to analyze lots of AAR data
2	Low faith in value of the process	1	Too much standardization can make AARs overly prescriptive
2	CR community performs well in AARs	1	Primary purpose of AAR is to document an event
2	Wings don't have lessons learned managers	1	AAR content dependent on leadership
2	Separate AARs into multiple categories	1	Good AAR should show DOTMLPFP impacts
2	Variety of AAR formats	1	Existing AAR template not robust
2	Description and narrative more valuable than data	1	Strength of process depends on culture
2	AAR process poor at multiple levels	1	AAR guidance is in AFI and CJSCI
2	Easy to overwhelm central AAR/LL location with data	1	JLLIS hard to use
2	Executive summary needs to be standard in AARs	1	One person on AMC staff that works lessons learned
2	AARs need subjective and objective information	1	Reliant on manual review/analysis of AAR for lessons learned
2	Task saturation hinders processes	1	Most lessons learned do not come from AARs
1	Strength of processes vary by unit/community	1	All AMC has access to the lessons learned tool
1	Repeat findings due to poor lessons learned	1	Functional OPRs on staff in directorates own their lessons learned
1	Experiential knowledge expires		

Appendix G: Focused Codes

Respondents	Code title
6	Feedback loops not closed
6	Units/communities have different needs for AARs
6	Need to formally codify AAR/LL processes
5	AARs suffer from poor accessibility
5	Need central AAR location
5	No standard AAR template
4	AARs serve multiple purposes
4	Reliance on direct communications for distribution
4	A problem worth solving
4	Current AARs are not effective

Appendix H: Information Categories ranked by level of importance

Information Category	Avg Response Score
Recommendations in response to specific observations/deficiencies	4.8125
Narrative description of lessons observed/learned	4.75
Narrative of recommended focus areas for next event	4.6875
Narrative description of significant challenges faced	4.6875
Description & explanation of why selected objectives' performance were less than satisfactory	4.625
Command and control diagram(s)	4.5625
Individual AARs for specific weapon system or functional community (C-17, C-130, C.R., Logistics, etc.)	4.5
List of overall event objectives or lines of effort	4.4375
List of significant observations during the event	4.4375
Narrative summary of overall event activities	4.3125
Narrative description of key accomplishments	4.3125
Description and explanation of why selected objectives' performance were satisfactory	4.25
Description and explanation of why selected objectives' performance were better than satisfactory	4.25
Description of events leading up to event on which the AAR is written	4.25
Standardized performance scores for selected tasks (i.e. wet wing defuel performance 4 out of 5)	4.125
Summary of planning activities prior to event	4.0625
List of commander's priorities established for the event	4.0625
Specific requests for commander endorsement or action	3.9375
Video content (e.g. video of procedures or performance, video interview with key personnel, etc.)	3.8125
Summary data: counts of accomplished activities, i.e. # of sorties, # of cancels, lbs cargo moved, etc.	3.75
List and description of individual event phases	3.6875
Narrative description of event's history (i.e. for recurring activities such as exercises)	3.625
Audio content (e.g. audio logs of performance, audio journaling, etc.)	3.5
Abbreviations and acronyms	3

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14. ABSTRACT
Lessons learned programs and collection via After Action Reports can be an asset to institutional learning. The current Air Mobility Command process suffers from a variety of factors, and could benefit from standardization, availability, analysis, and application. This paper updates a theoretical framework for successful AARs by incorporating a human behavior influence to the model. The study evaluates the standardized content of AARs, and recommends elements for a standard template. Other recommendations include using the Joint Lessons Learned Information System as an AAR repository, and concentrated effort to publish lessons learned guidance and build the supporting culture in the command.

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